Cognitive processes, sub-skills and strategies in academic lecture listening at a Saudi Arabian university: A needs analysis study

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Abstract

A needs analysis (NA) is widely viewed to be a key process in the development and ongoing revision of Language for Specific Purposes programmes (e.g. Brown, 2016), of which English for Academic Purposes (EAP) is typically considered a part. Determining and describing learners' language needs is important, as such information can be used when selecting or developing instructional activities for language learning, teaching and assessment, including L2 academic listening comprehension development. Though some EAP listening NA studies in a number of contexts exist, there has been a dearth of detailed analyses of lecture-listening processes. Moreover, past EAP listening NA studies are limited in their NA methodology. Therefore, the present exploratory, sequential mixed-methods NA research sets out to address these gaps by investigating the cognitive processing demands of Saudi Arabian students' listening in academic lectures (in an English Language and Literature department). The study aims to investigate their target and present listening needs, and language-learning listening wants.

This study collected, sequenced and triangulated data through a five-phase NA approach. The qualitative strand began with a spoken target language analysis of five real-world (linguistics and literature) lectures (Phase 1) to establish target listening needs in terms of cognitive processes and sub-skills. Following this, stimulated-recall interviews (Phase 2) were conducted with seven students who listened to the lectures collected in Phase 1 to identify their present listening needs in terms of cognitive processes, sub-skills and strategies. Interviews with five content lecturers and three students were then carried out (Phase 3), in which some data from Phases 1 and 2 were discussed to gather data on processes, sub-skills and strategies in relation to target, present and language-learning listening needs. Data generated from these three qualitative phases were analysed according to a listening framework developed on the basis of the literature (Field, 2013; Khalifa & Weir, 2009; Young, 1994; Vandergrift & Goh, 2012; Aryadoust, Goh & Lee, 2012). Next, an expert panel review session was held with four participants (Phase 4) to validate the processing needs identified by the researcher by means of randomly selected excerpts from Phases 1–3. This fourth phase thereby aimed to bridge the qualitative strand (Phases 1–3) and the next quantitative one (Phase 5). All previous phases in turn informed a student

questionnaire designed for Phase 5. This questionnaire was completed by 205 students, it collected data pertaining to all of this study's types of needs. Descriptive statistics and a principal component analysis were conducted to analyse the questionnaire data.

The qualitative results generally reveal that academic lecture listening triggers an array of lower-level (input decoding, lexical search, syntactic parsing and propositional meaning) and higher-level (inferencing, building a mental model, creating a text-level representation, creating an intertextual representation) cognitive processes as well as different processing sub-skills related to these seven cognitive processes. They also show the use of cognitive and metacognitive strategies in order to process aural input from lectures in the study's target language use (TLU) situation. Although the qualitative strand shows the use of several lower-level cognitive processes and sub-skills, considerable focus seems to be given to higher-level processes, in particular building a mental model and creating an intertextual representation while listening. The quantitative results show various similarities to the processes found in the qualitative strand, though a number of differences are also present. On the basis of the quantitative strand, 12 components are shown to emerge in terms of both target and present listening needs.

Methodologically, the study suggests that NA research should employ different methods in which data collection and analyses are sequenced and blended. Furthermore, the study identifies several cognitive demands (processes, sub-skills and strategies) that are recommended to be enhanced in L2 EAP listening courses so that learners can function competently in their future study area, i.e. the TLU. On the basis of the findings, an (L2) academic listening model in the context of real-world lecture listening processing is formulated, one which specifically includes sub-processes that deal with lengthy discourse processing. Such sub-processes include the imposition of a hierarchal structure on speech, which might be less prominent in other types of listening.

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Chapter 1 Introduction

In the 1990s, Flowerdew (1994) highlighted a research gap in second language (L2) academic listening, one still noted by researchers such as Hamp-Lyons (2011), i.e. that 'research on academic listening has always been sorely under-represented' in English for Academic Purposes (EAP) (p.96). In academic settings, lectures, as one type of academic listening, in particular at the undergraduate level, are an important instructional activity (Crawford-Camiciottoli, 2007). Lectures are traditionally defined as language events in which listeners are provided with information disseminated by a lecturer (Hansen & Jensen, 1994). However, they can vary depending on their formality and the listener's participation: lectures in which listeners ask questions and give opinions are considered interactive, as compared to monologic lectures (Carter, Martínez, Adolphs & Smith, 2012), and many will be a mixture of these two extremes.

Given the importance of helping listeners comprehend lectures, many studies have examined the effects of aspects of lectures, such as lecture structure (Dudley-Evans, 1994), speakers' accents (Ockey, Papageorgiou & French, 2016), discourse signalling cues (Jung, 2003), syntactic simplification (Cervantes & Gainer, 1992) and content knowledge (Jeon, 2007), on L2 listeners' comprehension ability. Nevertheless, the specific mental abilities which listeners employ when listening to lectures remain only partially understood; as Field (2011) argues, 'we know comparatively little of the processes upon which a student relies when attending a lecture in a second language' (p.102). A sound understanding of these processes might help EAP tutors run pre-sessional or in-sessional courses to target teaching listening precisely and prepare learners efficiently for real-world lecture experiences outside the EAP course (Field, 2011). In order to specify what abilities are employed in a target language use (TLU) situation, a needs analysis (NA), i.e. gathering information about learners' language needs, can be used as a source of such information, as Bachman and Palmer (1996) suggest. Therefore, this study aims to investigate L2 lecture-listening processing through an NA.

In this chapter, the background to this study is explained (1.1). Next, its significance is presented (1.2) and key terms are defined (1.3). The chapter closes with an explanation of how this thesis is structured (1.4).

1.1 Background

According to Imhof (1998), during real-life language communication in academic settings, college students spend roughly 50 percent of their time listening. Goh and Aryadoust (2016) further confirm that listening is critical to academic success, as it allows university students to learn and comprehend subject matter more accurately when it is delivered in lectures, seminars, small-group discussions, oral presentations and video-recorded lectures. Listening is also important when interacting with professors and peers.

For example, Lynch (1994) found that of the four sections of the Test of English at Matriculation (TEAM), only the listening comprehension section had a strong influence on the academic success of the L2 group. Listening accounted for 31% (out of 32%) of the explained variance when a year later Master students' TEAM scores were used to assess the predictive validity of the TEAM for student outcomes. This finding led Lynch (1994) to argue that there is an 'indirect', but important link between listening and academic success. Poor listening skills, especially in the early weeks of a course, can result in greater difficulty in understanding complex lectures and cause learners to fall behind in grasping key subject matter. Additionally, there may be psychological impacts, e.g. anxiety, loss of confidence and too much self-comparison with peers, especially regarding lecture material (Lynch, 1994).

Lynch (2015) also argues that listening to lectures can be particularly challenging, even for proficient listeners. Many students in academic settings generally do not have a clear idea of what listening actually entails or how to control and improve gathering information in that way (Janusik, 2010). This probably occurs because, as Taylor and Geranpayeh (2011) indicate, applying Cummins' (1980) conversational/academic language distinction theory, EAP listening as an academic language activity is often 'cognitively demanding' because of the significant effort needed to simultaneously process the amount of information necessary to understand and carry out that particular activity successfully. Further, EAP listening is often

'context-reduced', as the language user relies mainly on the language of the aural text, rather than adding other paralinguistic cues to convey a more precise meaning (Taylor & Geranpayeh, 2011).

More specifically, Taylor and Geranpayeh (2011) note that lecture-listening relies on complex mental processes, such as the capability to combine two sources of knowledge, namely, linguistic knowledge and content, to achieve comprehension, monitor understanding and reconcile information effectively from multi-modal input. For example, Olsen and Huckin (1990) attribute lecture comprehension problems not so much to linguistic inadequacies (lexis, syntax, phonology), but rather to a lack of higher-level skills. In particular, many L2 listeners are unable to recognise the macrostructure of discourse and identify logical connections between spoken ideas and indeed are found to understand all the words individually but still fail to grasp the key points of a lecture collectively (Olsen & Huckin, 1990).

To address the complexities of comprehending lectures, at least partially, there is a growing area of research investigating EAP listening needs, or what students, as listeners, must do during lecture-listening (e.g. Ferris & Tagg, 1996a, 1996b; Ferris, 1998; Powers, 1986; Kim, 2006; Sawaki & Nissan, 2009). However, these studies generally lack detailed analyses of EAP listening processing needs. Instead, they look at listening on a more general level or examine listening as a skill only associated with speaking. In addition, these studies tend to be limited in their methodology, as there is no recognised consensus on the role of comprehension ability in actual lecture-listening performance. Thus, to date, little research has been conducted on the actual processing employed by students during lecture-listening, or how listening occurs in real-life communication, by conducting NAs of TLU. Further research in this area is thus warranted. To address these research gaps, this study conducted an NA to reveal the cognitive processes, processing sub-skills and strategies that listeners need to comprehend lectures more effectively. These cognitive abilities are expressed as:

a) *Target needs*: the listening abilities a listener must have to function effectively in a TLU situation.
b) *Present needs*: the listening abilities a listener does not currently have.

c) *Language-learning wants*: the listening abilities a listener wants to learn and/or improve.

According to Taylor and Geranpayeh (2011), albeit while writing about academic listening tests, interest in communicative language teaching invokes a concern over 'authenticity'. Tests (or courses) need to tap into the abilities that a language user employs outside a test (course) situation, and particularly in real-life domains where the same language is used for communication. This concern coincides with an interest in teaching and testing Language for Specific Purposes (LSP), which emphasises the importance of conducting NAs because LSP teaching/testing seeks to 'achieve a much closer match between what happens in the test [course] and the actual language skills needed in the domain of academic study or vocational training' (p.90). Correspondingly, the language use undertaken in a particular domain, as Bachman and Palmer (1996) indicate, would make such a test (course) 'useful'. Basturkmen (2006) further points out that a course based on describing a target situation may help learners attain greater linguistic efficiency in a particular targeted domain. Basturkmen (2006), Jasso-Aguilar (2005) and Van Avermaet and Gysen (2006) further assert that a needs-based course is likely to be more motivational, as L2 learners will clearly see the relevance of what they are studying.

In practice, this study investigates the academic listening needs of English Language and Literature (ELL) students at King Saud University (KSU) in Saudi Arabia, particularly when listening to lectures. KSU was the first university established in Saudi Arabia. As a public university, it does not require students to pay fees, and it is considered to be one of the leading research and teaching universities in West Asia, achieving high scores in university rankings. The Department of English Language and Literature (ELL), where this study was conducted, was the first English department to be established in the country (1957) (University website). To put this in perspective, the English language has a solid and palpable presence in the country's education system because it is the only foreign language[1] taught to students at schools and universities. In general, it is assumed that the students participating in this research started studying English as a core subject in intermediate and secondary state schools from the seventh grade (at around age 12) to the twelfth grade, or in private schools offering English at the earlier age of around six.

[1] It is not, however, recognised as a second official language.

The NA was conducted at this university because its students were considered to be relatively representative of the educational level of typical Saudi students in the country. This was preferable to conducting the NA with students who might be proficient in English, but studying at the country's private universities, which may only be accessible to those who belong to rich and/or prestigious families. I carried out the NA study in the ELL department for several reasons: first, this department has a good reputation in terms of teaching. It is also a big department with a large number of students and lecturers to take part in the research. Additionally, as my study concerns students' English language needs, it was ideal to choose a department where the instruction is conducted almost exclusively in English. At the tertiary level in Saudi Arabia, English is deployed as the medium of instruction in most departments; however, this has not yet been implemented comprehensively. Instruction might be given in English in the medical fields, but for other programmes, such as engineering and science, the courses are taught in Arabic, while English textbooks are used[2] (Al-Seghayer, 2011). Thus, I was worried if I conducted my study in any other department, English might not be fully implemented as a medium of instruction, which would have had a negative effect on my research. Furthermore, the fact that I completed my undergraduate degree in English Language and Literature greatly helped me to plan my data collection (choosing the lectures and department), understand my data (particularly the content of the lectures, such as literature lectures) and analyse my data. I also focused on listening as a skill because the English language learning in this specific department seems to rarely teach listening (perhaps providing some note-taking workshops), but to focus greatly on providing writing workshops, such as 'how to write a killer introduction', and also on improving reading through a reading club. However, as I have observed, there are no official workshops/listening classes for, interest in or awareness of developing students' L2 academic listening abilities. They do not teach students how to listen effectively in academic contexts by providing instruction on how to listen and make the best of the lectures or even experiences outside the classroom, such as attending a play in a theatre.

[2] However, subjects are exclusively taught in English at two universities: King Fahd University of Petroleum and Minerals and King Abdullah University of Science and Technology.

Data were collected from L2 students in Years One, Two and Three, and from content lecturers. To date, little research has been conducted on listening NAs for ELL majors. One of the few studies focusing on this type of population is an NA conducted in Hungary by Kormos, Kontra and Csölle (2002), aiming to tap into students' language 'wants' *after* graduating from such majors. This study, however, focuses on in-study needs and wants. The focus in the present study is on listening to lectures, because ELL students' classes in the study context are heavily lecture-based. Further, Al-Jarf (2008), who studied a similar context (College of Languages and Translation at KSU), found that some students struggle at the outset of their English studies. This often causes them to get stuck at subsequent, more challenging levels, resulting in their repeating a course from two to five times and potentially graduating two years after their peers. This could be due to their inability to meet the academic language needs of the situation; inadequate listening comprehension may explain part of this difficulty.

1.2 Significance of the study

This study seeks to make a significant contribution to the scholarly literature on EAP listening comprehension in general, and lecture-listening in particular. The research findings will describe the set of listening processes, sub-skills and strategies needed to engage in while processing real-world lectures, as seen and perceived by L2 learners and non-native lecturers in a particular domain. This area is still not well understood in L2 listening, and thus the goal of this study is to advance that understanding in new and specific ways.

Theoretically, this study will present empirical evidence to inform the cognitive processing element for the EAP listening comprehension construct. Although no model currently exists that fully describes the listening process (Janusik, 2010), this study hopes to formulate a lecture-listening processing model based on what has been seen and perceived in L2 listener behaviour in a real-world domain, using five existing influential language comprehension frameworks. Of those frameworks, Field's (2013) is a recently developed model with great potential for describing academic listening in terms of real-world language processing. However, although Field includes a description of the functions of cognitive processes, his model lacks a fully enough elaborated analysis of what constitutes these processes (needed sub-

skills), or how L2 listeners can manage difficulties using listening strategies. His model is built solely on successful listening behaviour performed by competent listeners. Further, his model describes listening to a single text, it does not address listening that involves integrating information from a range of written/oral materials. Thus, the cognitive processes in his model seem to be incomplete. Some other models, namely, Khalifa and Weir (2009), Vandergrift and Goh (2012), Aryadoust, Goh and Lee (2012) and Young (1994), complement Field's model in certain ways. The proposed model for the current study, however, suggests that the cognitive element of EAP listening comprises processes, sub-skills and strategies (as an integrated skill group). The goal is to fine-tune the existing EAP listening processing models, in particular for lecture-listening.

Methodologically, this study plans to provide an example of an EAP NA methodological model that can be used to guide the practice of conducting NAs for learners with specialised, domain-specific L2 needs, with particular reference to lecture-listening, by using sequencing and triangulation, to provide greater in-depth understanding of a skill that can be useful for the design of a related course.

Practically, this study hopes to furnish valuable information that can assist EAP teaching experts and EAP listening courses run at university level at KSU, but also more widely, to move towards a better understanding of the cognitive demands imposed on L2 listeners and the concomitant struggles they go through to fulfil those demands. Specifically, the information will give them a clearer idea about the processes, sub-skills and strategies that are important for successful lecture-listening. As Goh and Aryadoust (2014) argue, there is a difference between the cognitive processing behaviour applied when listening to a short conversation and that applied when listening to an extended lecture, despite the fact that fundamental lower-level processes relate to both experiences. The study will also point out specific processes, sub-skills and strategies that can be separately targeted in pedagogy and then integrated when developing extended listening tasks, as researchers like Goh and Aryadoust (2014) and Field (1998) have suggested.

1.3 Definition of terms

This section defines the key terms in this study to establish a consistent meaning.

Need, according to Brindley (1989), refers to language that learners have to use in a specific communication situation (target language behaviour). A need therefore is 'the gap between what is and what should be' (p.65).

Target language use (TLU) situation/domain, in applied linguistics, is a term often used in an assessment context (Bachman & Palmer, 1996; Bejar, Douglas, Jamieson, Nissan, & Turner, 2000; Douglas, 2000; Gysen & Van Avermaet, 2005; Taylor & Geranpayeh, 2011) rather than in L2 listening pedagogy. A situation, according to Crystal (1991), is an extralinguistic setting wherein utterances take place. A TLU domain, as Bachman and Palmer (1996) define it, consists of certain language use tasks that a test-taker (language user) is likely to encounter beyond a test (course) situation, particularly, real-life communication.

Processing, as defined by Field (2004a), is the analysis and interpretation of input. Processing, in psycholinguistics, is 'used for the cognitive operations underlying (a) the four language skills; (b) the retrieval of lexical items; and (c) the construction of *meaning representations*.' (p.224). In this study, processing is defined as constructing meaning representations of the lecture content using cognitive processes, sub-skills and strategies to comprehend lectures effectively.

Cognitive process is opposed to linguistic product (Faerch & Kasper, 1980). Anderson (2009), referencing information-processing theory, defines processes, in relation to reading and listening, as sophisticated mental steps in which an abstract entity 'information' is processed to enable people to understand. Following Shiffrin and Schneider (1977), processes are automatic; in order to be automatic they require a considerable amount of training. Processes do not require attention and cannot be obstructed by limited capacity processing. In this study, cognitive listening processes are identified using a 'process model' which, as Ashcraft (2006) defines, is a hypothesis about specific processes in the mind that may occur when a specific task is performed. For example, input decoding and building a mental model.

Processing sub-skills, following Grabe (2009), Goh and Aryadoust (2014) and Goh (2014), are 'constituents' of cognitive processes. Sub-skills are thus automatic mental actions (Afflerbach, Pearson & Paris, 2008; Field, 1998; Grabe, 2009; Vandergrift & Goh, 2012) that can result in efficient and fluent decoding and comprehension (Afflerbach et al., 2008). For example, understanding technical words and identifying key points.

Processing strategies are conscious mental actions or decisions, which the L2 user undertakes (Rost, 2002). According to Shiffrin and Schneider (1977), strategies are controlled processes that can be activated through attention on the part of the language user. Language-use strategies can be cognitive (used to solve immediate or long-term problems) or metacognitive (used to monitor cognitive processing and strategies). For example, comprehension monitoring and prediction.

1.4 Thesis structure

This thesis consists of ten chapters, including this introductory chapter. Chapter 2 surveys the literature on NA as used in ESP/EAP language curriculum design by reviewing NA definitions, approaches and methodologies. It also identifies the NA framework used in this study and reviews past NA EAP listening studies to explain the justification for this study and investigate the lecture-listening construct in a TLU situation. Chapter 2 also presents theories of EAP listening comprehension, including reviewing text processing models related to listening and reading, and proposing a lecture-listening model to analyse the cognitive architecture for academic listening in this study. This leads to the formulation of this study's research questions in Chapter 3 and a description of the mixed-methods design used, including sequencing and triangulation. The overall five-phase NA design adopted in the study, involving different data-collection methods (spoken target language, stimulated recall, interviews, expert panel review, questionnaires) and sources of information (lectures, lecturers, students) is also explained in detail in this chapter.

The findings of the different phases are presented in five chapters, together with more detailed information on the methodology used in each research phase. Chapter 4 describes Phase 1 findings from corpus- and discourse-based analyses of recorded

lectures to identify processes and sub-skills that listeners need to use. Chapter 5 describes Phase 2 findings from a stimulated-recall procedure, which was conducted to identify listeners' present needs in terms of processes, sub-skills and strategies. Chapter 6, Phase 3, reports lecturer and student perceptions collected through interviews on processes, sub-skills and strategies regarding target, present and language-learning listening needs. Chapter 7, Phase 4, evaluates data sequenced in Phases 1–3 in order to proceed to Phase 5, using an expert panel review session. Chapter 8 describes Phase 5 findings pertaining to all the needs types of this study, collected using questionnaires.

Chapter 9 synthesises the findings and discusses the data based on the research questions and the literature. Finally, Chapter 10 summarises the findings, highlights the contributions, implications and limitations of the study and enumerates some lines of research that can inform NA and listening comprehension in the future.

Chapter 2 Literature review

2.1 Introduction

In this chapter, I conduct a review of the literature that ties in with my study's focus. First, with the aim of providing theoretical and empirical data on the processing of academic lecture listening as it occurs in a university setting, Section 2.2 draws on NA literature as it applies to ESP and EAP in applied linguistics. This section on NA is organised into five subsections. The first of these focuses on the history and definitions of NA (2.2.1), and the second on the relevant NA approaches (2.2.2). The next section discusses the NA framework of this study (2.2.3) to determine the NA approaches used and how they will be used vis-à-vis the listening processing. This is followed by a description of the recent NA methodological characteristics (2.2.4). The final subsection examines the previous studies on listening NA to determine their gaps and provide a rationale for this study (2.2.5).

Section 2.3. focuses on L2 listening comprehension research. This section explores the academic listening construct and focuses particularly on lecture listening. It also reviews five existing models related to text comprehension processing in both listening and reading to help with proposing a model to analyse the cognitive listening needs in this study. In 2.3.2, first two process models introduced in a language testing context that focus exclusively on real-world processing are described: Field's (2013) listening model and Khalifa and Weir's (2009) reading model. Both are included since Field (2013) partly built his model on Khalifa and Weir (2009) but aspects of the latter are also related directly to this study. Next, models are reviewed that seem to embrace another approach, deconstructing cognitive processes into their constituents, i.e. processing sub-skills. This leads to a description of how this sub-skills view is represented in the literature in terms of speculative and research-based taxonomies. In this context, Aryadoust et al.'s (2012) model is reviewed. Additionally, Young's (1994) model, which specifically focuses on lectures, is discussed as it shows the potential to understand how lectures can be organised. As a final model, Vandergrift and Goh's (2012) model, formulated in an L2 acquisition context and posited to teach listening effectively, is reviewed. Then, studies looking into using cognitive and metacognitive strategies across different language-proficiency levels of learners are

covered. These models are compared and inform the model proposed in 2.3.3. Section 2.3.4 reviews relevant previous research on factors affecting the success of lecture listening comprehension.

The chapter concludes in 2.4 with highlighting gaps in the literature in relation to both NA and academic listening processing to suggest that these aspects will be addressed in this study.

2.2 Needs analysis (NA)

Successful English language learning is essential for non-native speaker (NNS) students who are educated in English as a medium of instruction in their own countries or as overseas students (Long, 2005a). Long (2005b) points out that many adult students may have 'serious academic needs' vis-à-vis L2 proficiency (p.19), including listening comprehension. Richards (1983) emphasises that identifying learners' language needs is important as such information can be used when selecting or developing instructional activities for language learning, including listening comprehension development.

Thus the following subsections present: a brief historical overview and definitions of NA (2.2.1), relevant NA approaches (2.2.2), and this study's NA framework (2.2.3). In the penultimate section, 2.2.4, the methodological characteristics of recent NAs, similar to the methodology used in this study, are discussed. This section closes in 2.2.5 with past listening NAs and their shortcomings, which are reviewed to motivate this study.

2.2.1 NA history and general definition

Historically, NA was first termed 'analysis of needs' and was introduced by Michael West during the 1920s to identify ESL secondary-level learners' language needs (West, 1994). The use of the term in applied linguistics disappeared for a while but resurfaced later (West, 1994). Hutchinson and Waters (1987), Nelson (2000) and West (1994), regard the early 1960s, when the term ESP was coined, as marking a resurgence in NA. Particularly in response to the arrival of more international students in British universities, a small number of linguists took on the responsibility for developing materials by gathering information about the language and language use that those students required in their specialised fields (Long, 2015). The term EAP emerged in this context and, as Long (2015) notes, the development of the

SELMOUS group[3] – lecturers focusing on materials development for overseas students (Jordan, 2002) – subsequently played a role in further development of NA research.

Some important NAs were those conducted in the 1970s and '80s (Hamp-Lyons, 2011; Long, 2015; Nelson, 2000; West, 1994), e.g. the NA theoretical project conducted for the Council of Europe by Wilkins, Richterich and other researchers (Richterich & Chancerel, 1971/1980) and Munby's (1978) model for a communication needs processor (CNP). According to Richterich and Chancerel (1971/1980), the Council of Europe devised a unit credit system in which specific units described language proficiency and TLU for adult European learners whose jobs require travel for work[4]. These learners need just the right kind of target language to satisfy their basic communicative needs for their work, and the unit credit system contains skills that may be applicable across European languages. Long (2005b) argues that the Council's work completely ignored cognitive processing constraints in learning and teaching and was built around teaching linguistic units separately. Despite these shortcomings, however, Nelson (2000) indicates the Council's work was considered as 'heralding' communicative language teaching, as it promoted a view of language consisting of target functions (purposes to which language is put) and notions (ideas expressed by language). Nelson (2000) further adds that their project specifically led to the emergence of the concept of target-situation analysis (TSA), as the efforts of those linguists resulted in a search to identify those TLU situations in which learners would need new language. This process required an attempt to determine the language needed to function in particular situations, leading to a more formal version of the TSA approach, as used in Munby's model (Long, 2015; Nelson, 2000), which is discussed in the next subsection.

NA then became a key process in the development and ongoing revision of ESP[5] programmes (Basturkmen, 2013; Brown, 2009, 2016; Belcher, 2006; Dudley-Evans &

[3] SELMOUS-BAAL stands for Special English Language Materials for Overseas University Students (Long, 2015). In 1989, this was renamed the British Association of Lecturers in English for Academic Purposes (BALEAP) (Jordan, 1997).
[4] The Council considered language activities (writing letters), (face-to-face) language situations, language functions (arguing) and language skills (Robinson, 1980).
[5] ESP is 'the role of English in a language course or programme of instruction in which the content and aims of the course are fixed by the specific needs of a particular group of learners' (Richards & Schmidt, 2010, p.198).

St John, 1998; Hyland, 2009; Serafini, Lake & Long, 2015; West, 1994), of which EAP[6] is typically considered a part. Brown (2016) defines NA as 'the systematic collection and analysis of all information necessary for defining and validating a defensible curriculum' (p.4). NA results can be used wholly or partly to inform ESP course design in terms of what has to be taught and learned so that learners can function linguistically and competently in their future study area or job (Basturkmen, 2013), i.e. a specific situation involving TLU. An NA can also involve gathering information about issues beyond learners' language needs (Long, 2015), e.g. how to specify the sequence (Basturkmen, 2013) or ordering (Brown, 2016) of the instruction or content that will be covered in a syllabus.

Many NA studies are reported in the ESP (e.g. Lepetit & Cichocki, 2002) and EAP (e.g. Coleman, 1988) literature. For example, Huh (2006) conducted a task-based NA to identify target business tasks, using semi-structured interviews and questionnaires, that Korean business professionals may encounter in a real-world context for a general business English course at the University of Hawaii.

2.2.2 NA approaches

This section describes three relevant NA approaches: target-situation analysis, present-situation analysis and learning-centred situation analysis. Brown (2016) states that these approaches are ways to explore and analyse information to specify what the current language needs are in a particular TLU situation.

2.2.2.1 Target-situation analysis (TSA)

West (1994) mentions that Target-Situation Analysis (TSA) is the most common approach in NA; and it has even been stated that without TSA there is no NA (Chambers, 1980). Chambers (1980) writes that TSA 'necessitates going into the target situations, collecting data and analysing that data in order to establish the communication that really occurs – its functions, forms, and frequencies – then selecting from these on some pragmatic pedagogical basis' (p.29).

Brown (2016) splits TSA into two types: target-situation *use* analysis (TSUA) and target-situation *linguistic* analysis (TSLA). TSUA, examining language use, involves

[6] Focusing particularly on academic contexts (Hamp-Lyons, 2011).

collecting information about how people use language in their discourse community, whereas TSLA investigates the linguistic features in the language uses specified by the TSUA. According to Hutchinson and Waters (1987), TSA initially involved looking exclusively at TSUA and TSLA. Then there seemed to be a shift to include an approach, called skills and strategies analysis (SSA), that takes into consideration the 'thinking processes' underlying language use (p.13), rather than the language itself (determined by TSAs). Hutchinson and Waters state that SSA was grounded in the belief that there are common reasoning and interpreting processes underlying all language use that might enable individuals to derive meaning from discourse, regardless of its linguistic features. Thus, West (1994) mentions that TSA can range from identifying needs at a basic level in terms of broad skills priorities (e.g. written French) to identifying needs in terms of situations or functions (e.g. listening to lectures); it can go even further to determine specific components that are essential to cope in a particular situation (thus, describing needs in terms of linguistic features and cognitive processes, which this research aims to investigate, falls into this deeper level of TSA).

As mentioned earlier, perhaps the best-known example of TSA is Munby's (1978) work for the British Council. West (1994) states that the resulting book, *Communicative Syllabus Design,* accorded NA a central place in ESP. Munby (1978) designed his CNP model after he noticed the lack of a rigorous approach and appropriate specifications for ESP syllabus design, which should be based on target communication needs (Munby, 1978). The model first produced a profile of each learner's needs based on responses to questions about key person variables, e.g. identity and purpose for learning English, and about target situation, e.g. the field for which English is needed. Next, data needed to be gathered about communicative interactions in the target situation, whether the learner needs to deal with spoken and/or written language, whether the learner needs to function in monologue or dialogue mode, whether communication is to be face-to-face or over the telephone, and similar variables. Data regarding dialects and the student's desired competency level and the degree of complexity a learner is expected to encounter in texts/utterances in the TLU situation also needed to be gathered. A taxonomy of 54 language functions and 260 language 'enabling skills' was produced. Amongst those were listening skills, such as discriminating sounds; recognising stress within a word

and connected speech; comprehending sentence structure, negation and complex embedding; understanding explicit information; distinguishing between key points and details in long discourse. Skills in distinguishing a whole from its parts, a process and its stages, a statement from an example, an opinion from a fact, and extracting information for comparison and contrast were also identified for use when listening to lectures (Munby, 1978).

Munby's work has, however, also been criticised, particularly, as West (1994) notes, because of its complexity, as it takes a long time to work through. Criticism especially concerns the excessive length of his taxonomy of micro-skills (Nelson, 2000). Long (2015) indicates that Munby's model also excludes learners' affective and cognitive characteristics (e.g. motivation, learning styles, strategies). Finally, Munby assumed that an adequate NA need not directly involve the learner (Long, 2015). But Jordan (1997) and West (1994) state that most subsequent NAs were designed to overcome the shortcomings of Munby's model, as they aimed for simplicity and involving learners.

As Basturkmen (2013) and Brown (2016) stress, however, TSA cannot work as the sole data source for NA and so it is usually combined with other NA approaches, as will be presented below.

2.2.2.2 Present-situation analysis (PSA)

As opposed to deciding in advance what target linguistic or cognitive features should be taught (cf. TSA), ESP tutors or designers ought not to make assumptions about target linguistic features and learners' language abilities vis-à-vis TLU (Belcher, 2006). Jordan (1997) mentions that a Present-Situation Analysis (PSA) requires the assessment of learners' current state of language development at the beginning of a language course. Basturkmen (2013) further adds that PSA is also designed to assess students' current ability to perform target tasks, activities and skills identified by TSA, that is, as Belcher (2006) mentions, it examines the gap between 'target language use' and 'current learner proficiencies' (p.136). This is because, as Belcher (2006) states, ESP generally assumes that there are language problems which can be identified through PSA, and these problems seem to be unique to specific learners in

specific contexts, and thus they should be carefully defined and targeted with tailored-to-fit instruction.

Hyland (2006) states that conducting PSAs involves gathering various data, e.g. information about age, general proficiency, prior learning experience and self-perceived strengths and weaknesses. Brown (2016) adds that test scores, from placement tests, or corpora of learner-produced writing samples can be part of PSA. West (1994) indicates that PSA may also involve exploring whether learners are required to perform a skill in the target language that they are unable to accomplish in their mother tongue. This information may be important in curriculum design (West, 1994), as Alderson (1980) (cited in West, 1994, p.10) states that 'teaching a student to do something in English which he or she can already do in Spanish is a different problem from teaching him or her something in English which he or she cannot do in Spanish'. West (1994) argues that identifying difficulties generally determines the syllabus. For example, Alderson (1980) (cited in West, 1994, p.4) argues that 'rhetorical structures are not included in the syllabus simply because they exist, but only if they are either seen to cause comprehension difficulty'.

2.2.2.3 Learning-centred situation analysis (LCSA)

Hutchinson and Waters (1987) proposed a Learning-Centred Situation Analysis (LCSA) framework in which the complete dependence of previous approaches on describing TLU is rejected because, in their view, describing what people do with language will not enable someone to learn it (language use). Hutchinson and Waters indicate that NA should also include LCSA in addition to other approaches. They argue that TSA gleans information in terms of language items, skills, strategies and content knowledge that individuals need to function effectively in a particular situation, but TSA cannot address 'how' learners learn those language items, skills and strategies; that is what an LCSA can do.

LCSA gathers information by asking a series of questions, as proposed by Hutchinson and Waters, including questions about the advisability of using mono-skill or integrated skills methodologies, whether learners' attitudes and feelings about various learning activities might vary during a language course, why learners are taking the course, whether they want to improve their English, their learning

background and subject knowledge, techniques that are likely to bore or alienate them, and other similar variables.

2.2.3 NA framework

In light of this theoretical background, this study combines three NA approaches to examine three types of needs to reflect NA's multifaceted nature (Basturkmen, 2010) with reference to academic listening:

1. The TSA approach, with its two types: TSUA, which looks into cognitive processes, sub-skills and strategies underlying listening to lectures in a real-world situation – as will be discussed in 2.3.2 and 2.3.3; and TSLA, which examines six text linguistic features of this specific situation. This is done to identify *target listening needs,* representing the ends or final destination of the learner's (listener's) journey (Basturkmen, 2010).

2. The PSA approach, which is an approach that looks at learners' deficiencies—i.e. listening difficulties in this study to establish *present listening needs*, representing the point of departure on the language-learning journey (Basturkmen, 2010). Robinson (1980) writes that, 'in practice, one is likely to seek and find information relating to both TSA and PSA simultaneously … thus needs analysis may be seen as a combination of TSA and PSA' (p.9).

3. LCSA is used due to the current perspective on which NA is founded: the assumption that ESP courses are concerned not only with *language use* but also with *language learning* (Basturkmen, 2010; Hutchinson & Waters, 1987). LCSA seems meaningful but, in this study, it only involves gathering data about learners (listeners) attitudes towards themselves as lecture listeners and preferences regarding what they would like to learn to improve their academic listening to identify *language-learning listening wants*, as many issues in Hutchinson and Water's LCSA approach are more applicable after a course is implemented (e.g. what sources are available for the ESP course).

2.2.4 NA methodology

Long (2005a) points out that researchers such as Munby (1978), Jordan (1997), Richterich (1977/1980) and Hutchinson and Waters (1987) established the theoretical basis of NA in the form of conceptual approaches to and explanations of the complexities of investigating domain-specific TLU. Thus Long (2005a) argues that a serious effort is required by applied linguists when reporting successful methodological frameworks that might provide insights into conducting NAs in different sectors, since 'research on the methodology of needs analysis itself […] is scarce' (p.5). Also, while many NAs have been conducted, Long (2005b) mentions that most NAs are limited to reporting their results; few discuss NA methodologies. In this regard, Long (2005b, 2015) stresses that, to ensure collecting quality data and not just a large quantity of data that may not be useful later (for course or test design), a critical feature of professional NAs is triangulating and carefully sequencing data by comparing and following up on differences and similarities obtained from different methods and sources – an approach endorsed in the current study. According to Long (2005b, 2015) and Brown (2009, 2016), the sequencing in NA, namely, building on findings from previous data collection and analyses, can be used in conjunction with triangulation (and could be more important than triangulation (Brown, 2009)), but this sequencing practice does not appear to be common in NA research.

Nevertheless, recent NAs (van Houtven, Peters & Van den Branden, 2013; Serafini et al., 2015) involved not only the use of multiple methods and sources of information and triangulation, but also sequenced data. Houtven et al. (2013) aimed to identify the literacy needs (reading, text competence, academic register) of Flemish L1 teacher trainees in a higher-education context to inform task-based reading materials. The value of triangulation and sequencing proved crucial; they concluded that 'without the sequencing of the language test, the questionnaire and the interview, we would not have been able to identify students' needs' (Houtven et al., 2013, p.19). They also asserted that to ensure reliable data about language learning needs are gathered, 'sources and methods should not only be carefully sequenced but should be triangulated as well' (Houtven et al., 2013, p.1). They sequenced one approach, TSA, to collect target needs via two sources (language and content lecturers and first-year pre-experience and third-year experienced students), and sequenced data from a proficiency-reading test and

interviews to develop a questionnaire, of which the results were in turn used to design a focus-group interview.

Serafini et al. (2015) conducted a large-scale task-based NA to identify the communicative English language needs for post-docs (mainly NNSs and NSs) needing to function competently in a field-specific discourse domain in an American scientific research institution. Unlike Houtven et al., who started with a closed data-gathering method and moved on to more open ones, Serafini et al. first sequenced data from open methods, then from a more closed one, before ending up with an open method. Serafini et al.'s NA comprised four steps: Step 1 consisted of semi-structured interviews with in-service trainees (international post-docs) and investigators (supervisors). Next, from the interviews, they derived a list of perceived language needs, language difficulties, cultural differences and the future language and culture goals of international post-docs, vis-à-vis work and outside life. This list informed a closed-item questionnaire design (Step 2). Questionnaire results suggested the need for follow-up data due to disparities in the responses, so they added a further step that could help to elucidate the findings. Hence, Step 3 used observations in labs and analyses of recorded TLU discourse. Finally, in Step 4, they triangulated data collected from the three previous steps to determine the most frequent, important and difficult TLU tasks.

Nevertheless, conducting NA is both time-consuming and labour-intensive, and it should be conducted by qualified applied linguists or experienced instructors, as Long (2015) states. Brown (2016), however, indicates that because there are many issues that can involve different stakeholders in relation to an NA, needs analysts must collect only relevant and practical data if an NA is to be useful.

2.2.5 Previous listening NA studies

A body of research has explored language needs in relation to the four skills (reading, writing, speaking, listening) in a single study (e.g. Akyel & Ozek, 2010; Shing, Sim & Bahrani, 2013; Zhu & Flaitz, 2005; Zughoul & Hussein, 1985;), but a review of the literature indicates that few NA studies have attempted to investigate academic listening requirements, the focus of this NA, in a university context. NAs on EAP listening include those conducted by Ferris and Tagg (1996a; 1996b), Ferris (1998), Kim (2006), Powers (1986), Teng (2000) and Sawaki and Nissan (2009), and these

underscore the importance of examining a specific TLU situation to predict what is required of listeners. This section reviews those listening NAs, conducted in an EAP context, including pointing out their shortcomings to justify this research.

The NAs conducted by Ferris and Tagg (1996a, 1996b) and Ferris (1998) are amongst earlier studies that looked into ESL university students' listening and speaking communication skills.[7] Ferris and Tagg (1996a, 1996b) surveyed 234 lecturers from several disciplines at four US tertiary institutions. In the former study, lecturers indicated that they generally require students to have strong note-taking skills and to participate and interact in class, whereas skills such as student-led discussions and debates tend to be rare, and thus not as important in actual situations. In the latter study, based on the quantitative part of their survey, lecturers indicated that some students might have difficulties when participating in interactive classes, working with peers, understanding lectures and taking effective notes.

Based on these two studies, and more data from Ferris's (1998) study in which 768 ESL students in different disciplines at three tertiary institutions were approached using surveys, Ferris (1998) wrote that 'two groups of informants from the same context appear to hold such drastically different perceptions' concerning disciplines' listening-speaking requirements and difficulties' (p.311). For example, students indicated that participating in debates and leading discussions with the whole class, presentations and note-taking are important for success in their fields, whereas small-group work and class participation are not. This is the opposite of what lecturers claim in Ferris and Tagg (1996a), except for note-taking. Likewise, students indicated having trouble with note-taking, presentations, student-led discussions and large-group debates, but less so with class participation and asking questions, which are seen as problems by lecturers in Ferris and Tagg (1996b). Lecturers (Ferris & Tagg, 1996b) and students (Ferris, 1998) generally want EAP instructors to pay more attention to developing students' general listening comprehension, rather than concentrating on lecture comprehension and note-taking. Qualitatively, lecturers mention the necessity to train students in how to ask and answer questions during interactive listening and to take appropriate notes (Ferris & Tagg, 1996b), whereas students do not concur with the importance of improving their note-taking (Ferris,

[7] They used the term 'tasks' interchangeably with 'skills'.

1998). Thus, students and lecturers disagree on which are the most important skills they require and what students struggle with. Ferris (1998) attributes this discrepancy to the fact that listening and speaking needs are often 'implicit' for students, and thus students might not easily reflect on them (p.307). While such needs seem to be clear to lecturers, because they teach target courses, when it comes to identifying listeners' problems, this does not seem to be easy for lecturers and their perceptions might be based on what they see in exam performance.

In a questionnaire in Kim (2006), 70 East Asian graduate students at a US university across different non-science majors indicated that listening and speaking skills, such as engaging in discussions with the whole class and in small groups and raising questions, were most frequently expected in their classes, whereas note-taking was less important, the opposite of what is indicated in Ferris (1998).

To investigate the construct validity of the TOEFL listening section, Powers (1986) used a questionnaire to obtain 144 graduate and undergraduate faculty members' perceptions from different disciplines at 28 US and Canadian institutions. Lecturers perceived nine vital listening skills: identification of major themes; relationships among main ideas; a lecture's topic; note-taking; retrieving information from notes; inferring connections between ideas; understanding key words; following a lecture; and recognising examples and supporting details to be more important to academic performance than other secondary skills, such as recognising irrelevant ideas, recognising nonverbal cues, tone of voice and pitch-to-signal information structure. Lecturers also thought that their NNS students might encounter disproportionately more severe problems, particularly when following informal lectures delivered at different speeds, understanding vocabulary and recognising discourse markers. Further, lecturers commented that they often notice that their NNs students do not understand idioms, slang, technical terms and nonliteral language and misinterpret irony and assignments, though they are less likely to suffer from a lecturer speaking too fast.

Despite having generated many insights, the aforementioned NAs have methodological shortcomings and differ in their foci, as they were conducted to identify general EAP needs across different disciplines, not specific EAP aims (e.g. Ferris, 1998; Powers, 1986), which might explain the conflicting results from these

studies. Most of these studies relied on using questionnaires only. They were concerned with obtaining what Ferris and Tagg (1996a) call 'an aerial view' (p.19) of academic oral needs, as they focus on breadth, rather than depth. Some studies also involved a sole stakeholder (e.g. only faculty members in Powers, 1986). Meanwhile the NA literature (Long, 2005b, 2015) recommends using the perceptions of multiple audiences and methods so that each group or method complements others. Moreover, Ferris (1998) and Sawaki and Nissan (2009) asked participants to choose a single course and reflect on its requirements, Kim (2006) requested participants to think solely about those classes involving a significant amount of verbal participation, but not all courses being studied during, say, one semester, and thus the findings might not be representative of academic listening needs across the different courses that students need to attend. Additionally, some studies' participants (Teng, 2000; Ferris, 1998) did not concern subject-specific English users; rather, the participants were doing a language course at a university and thus might have few ideas about TLU situations in which they could find themselves in the future. Also, these NA studies (e.g. Ferris, 1998) that sampled the opinions of two groups of stakeholders usually report differences and/or similarities between the two groups separately, but nothing more. Long (2005b), however, emphasises that a critical feature of professional NAs is triangulating and sequencing data by comparing, blending and following up on differences and similarities obtained from different methods and sources.

In some studies, the investigation of listening is not separated from that of speaking (interactive listening) (Ferris & Tagg, 1996a; 1996b; Kim, 2006). Consequently, listening is not studied in depth and exclusive results are not given because listening is treated as a two-way process from which speaking cannot be separated. In terms of theory-driven research, past listening NAs have not been informed by a rigorous framework of listening in which identified sub-skills and strategies are related to cognitive processes; rather, most of their questionnaires were developed solely based on speculative taxonomies of listening sub-skills (e.g. Powers, 1986; Teng, 2000; Sawaki & Nissan, 2009).

Importantly, most of these studies were more concerned with identifying broad academic listening skills, such as understanding lectures, listening to guest speakers and note-taking, but did not go further and examine what specific sub-skills, strategies and

cognitive processes might be involved in academic listening, except perhaps for Powers (1986), who listed 17 specific sub-skills in his survey.

To conclude, previous academic listening studies are limited in their NA methodologies; yield conflicting results; examine listening on a more general level; and are not informed by theoretical listening models. Thus, such studies lack detailed analyses of academic listening needs, particularly within the context of listening to lectures. Consequently, the need for more research exploring lecture-listening comprehension is indeed substantiated, as it is still unclear what specific abilities are called on while processing real-world lectures. This study therefore sets out to describe the listening construct underlying listening to lectures in a TLU situation, being guided by theoretical models of cognitive processes and the sub-skills and strategies involved in listening – as will be described below – using three NA approaches.

2.3 Listening comprehension

Broadly, listening requires real-time processing because input is temporally distributed and ephemeral; hence, a listener does not have the option to go back to earlier sections of the text that s/he missed (Bloomfield et al., 2011; Imhof, 2010). This is particularly the case for lecture listening (unless students record their lectures). L2 listening also has been labelled the 'Cinderella skill' (Nunan, 1997, p.42) because, historically, it has been the least-examined language skill, most probably due to the difficulty in observing and measuring it (Vandergrift, 2007). Brunfaut (2016), however, points out that listening research has attracted more interest over the last decade. Meanwhile Aryadoust (2013) notes that researchers seem to struggle to describe the complex nature of listening adequately and to find 'a commonly adhered-to model of listening comprehension' to support their research (p.9). In particular, research into academic listening, which partly has characteristics as well as challenges distinct from conversational listening (Flowerdew, 1994; Goh & Aryadoust, 2014), is sparse (e.g. Goh & Aryadoust, 2014; Lynch, 2011).

This section synthesises relevant listening comprehension literature because the NA conducted in the present study focuses exclusively on listening. It seeks to explore the academic (EAP) listening construct in 2.3.1 and to review theories on text

comprehension processing in 2.3.2. The section also proposes a lecture-listening model to analyse the cognitive 'architecture' for academic listening in this study (2.3.3). Section 2.3.4 closes by reviewing relevant previous research on factors affecting the success of lecture listening comprehension.

2.3.1 Exploring the construct of academic listening

Academic listening, as Flowerdew and Miller (2014) define it, is 'the processing of spoken language in academic contexts' (p.90). In an academic studies context, listening is likely to involve comprehending monologic lectures, conference presentations (one-way listening) and interactive lectures, seminars, tutorials and meetings with supervisors (two-way listening) (Lynch, 2011).

Goh and Aryadoust (2014) and Goh (2013) contend that the academic listening construct shares many characteristics with the conversational or general listening construct; however, there are also differences between the two since listeners deal with different types of discourse. Goh (2013) states that both constructs draw on the same cognitive processes, macro skills and knowledge sources, while differences lie primarily in the 'new' skills (or sub-skills), especially higher-level skills, that must be 'additionally acquired' (p.59) and added to the EAP listeners' existing repertoires so they can deal effectively with the cognitive demands of a specific context. For example, both EAP listening and conversational listening require processing vocabulary, but EAP listeners often need to understand additional vocabulary, e.g. technical words and specific idiomatic expressions (Goh, 2013). EAP listeners might also need to process longer utterances containing grammatical structures that might be encountered in written language, unlike when listening to those utterances with the 'loose' grammar often heard in general listening (Goh & Aryadoust, 2014). While conversational listeners still need to anticipate how a conversation is structured, EAP listeners are often required to engage in predicting how a lengthy lecture is structured by, for example, exploiting discourse signals (Goh, 2013), so perhaps predicting structure is more important in EAP listening than in general listening. Flowerdew (1994) also mentions essential EAP abilities, including concentrating and comprehending extended discourse, as well as taking notes and concurrently integrating information from different sources, that are often needed less in general listening. Therefore, as Goh (2013) and Flowerdew (1994) conclude, the 'kind' and

'degree' of use of cognitive processes and skills to process aural input may depend on the cognitive demands imposed by a specific context.

Most EAP listening research focuses on lectures (Flowerdew & Miller, 2014). This may be because lectures, in particular, are considered important opportunities for students to learn the subject matter they need and tend to dominate most university instruction (Crawford-Camiciottoli, 2007; Lynch, 2011; Flowerdew, 1994). According to Crawford-Camiciottoli (2007), the primary goal of a lecture is 'to impart knowledge, teach skills and practices, induct learners into discourse communities, promote critical thinking and encourage a positive attitude towards learning' (p.16). Therefore, lectures are considered vital language events, and lecture listening is thus a vital skill to gain knowledge in an academic milieu (Jordan, 1997). At the same time, it has been claimed that many L2 listeners encounter difficulties during lecture-listening (Goh, 2013; Lee, 2009; Lynch, 2015; Olsen & Huckin, 1990), more so than L1 listeners (Berman & Cheng, 2010; Powers, 1986; Goh & Aryadoust, 2016), as lectures involve extracting salient information and recording information as notes (Thompson, 1994). For example, several studies have explored ESL/EFL students' perceptions of their lecture-listening experiences. Evans and Morrison (2011) found that first-year undergraduates in Hong Kong reported difficulties with comprehending technical vocabulary and (to a lesser extent) general academic words (despite using strategies like writing keywords and decomposing word affixes and roots), understanding their lecturers' accents and even having to listen to poorly organised lectures. Huang (2004) found that American professors' long and complex utterances, colloquial expressions, unclear pronunciation and failure to define central concepts and terms interfered with Chinese students' listening. Flowerdew and Miller (1992) reported certain problems that first-year students in Hong Kong encountered when processing lectures in BA TESL methods classes: speedy delivery, excessive load of new discipline-specific terms and complex concepts, limited subject-specific knowledge and difficulties with concentration. Therefore, to overcome listening problems, EAP listeners can benefit from learning how to employ cognitive processes, sub-skills and strategies to achieve comprehension gaols, which is the theme of the following subsection.

2.3.2 Language comprehension processing models

In cognitive psychology, listening is conceptualised as an act of information processing (Cutler & Clifton, 1999). Graesser and Britton (1996) state that 'text understanding is the dynamic process of constructing coherent representations and inferences at multiple levels of text and context, within the bottleneck of a limited-capacity working memory' (p.349). Further, scholars such as Imhof (2010), O'Malley, Chamot, and Küpper (1989), and O'Malley and Chamot (1990) generally agree that language comprehension, including listening, consists of an array of rapid sequences of complex and active processes and analyses that are necessary to construct a mental representation of the text in memory. The resulting product of information processing is a text representation (Imhof, 2010) that forms an 'interconnected network of idea units […] expressed in a message' (Singer, 1994, p.479). The issue of how text representation can be constructed has prompted the formulation of a range of cognitive theoretical insights within disciplines such as psychology and linguistics, which provide an important framework for describing L2 listening (Vandergrift & Goh, 2009).

To provide a theoretical rationale for the listening model of the present study and to understand how text comprehension occurs, five complementary text comprehension models are reviewed here.

First, Field's (2013) cognitive process model for describing real-world academic listening is described in 2.3.2.1. However, this model lacks some elements that might be important in academic listening, and so Khalifa and Weir's (2009) cognitive reading processing is reviewed in addition in 2.3.2.2. The L2 listening literature also suggests another distinct view concerning deconstructing processes into sub-skills, rather than a purely cognitive process approach. Therefore, listening sub-skill taxonomies are presented in 2.3.2.3, followed by the more recent sub-skill model of Aryadoust et al. (2012) in 2.3.2.4, which includes major sub-skills thought to contribute to successful academic listening. Also, since this study focuses on lecture comprehension, Young's (1994) lecture structure model, presented in 2.3.2.5, can provide an understanding of how lectures are organised and elaborate processes concerning text structures. Next, Vandergrift and Goh's (2012) model designed to explain L2 listening is reviewed in 2.3.2.6, which leads to describing how listeners

can use listening strategies covered in 2.3.2.7. Finally, these models are compared in 2.3.2.8 and inform the model proposed in 2.3.3. Figure 2-1 illustrates the contents of this subsection.

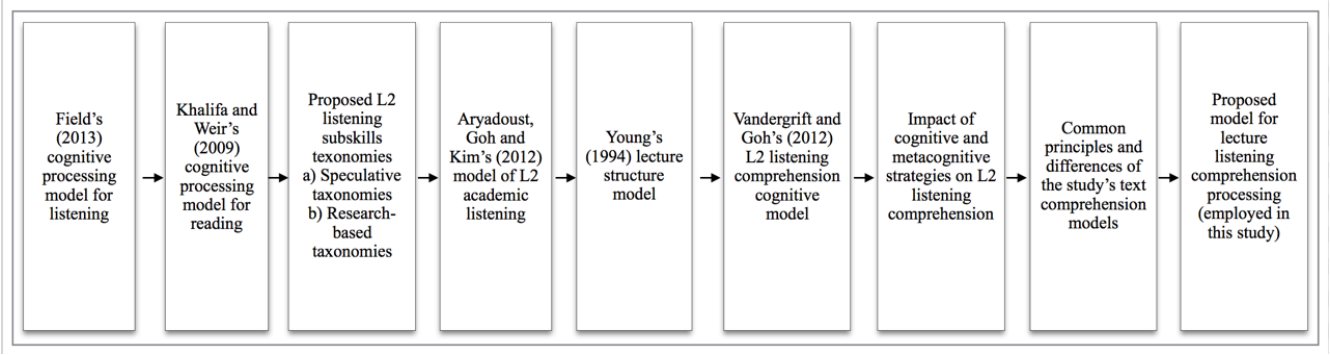


Figure 2-1: Contents of subsection 2.3.2, Language comprehension processing models

2.3.2.1 Field's (2013) cognitive processing model for listening

Although no single model of listening combines all the complexities of listening comprehension (Buck, 2001; Janusik, 2010), Field's (2013) model seems to have great potential to understand academic listening comprehension. This model, as Field (2012) argues, is not based on information derived from what listeners believe they engage in (strategy use), nor from what researchers believe listeners should do (speculative-listening taxonomies). Rather, this model is based on theory and evidence from models for listening, speech perception and meaning-building in L1 processing (Field, 2012), psycholinguistics, phonetics and discourse analysis (Field, 2013). As Field (2012) indicates, these models are thought to be more theoretically reliable because they are based on solid findings in cognitive psychology. Although this model is proposed to address cognitive validity in an assessment context, Field (2014) also mentions that his model can be used to guide effective listening pedagogy. Finally, most of Field's empirical underpinning originates from EAP contexts, particularly lectures that derive from standardised tests, similar to this study's interest in academic listening.

According to Field (2013), listening can be broadly seen as comprising five main processes: 1) *input decoding*; 2) *lexical search*; 3) *parsing*; 4) *meaning construction*; and 5) *discourse construction*. As each deals with a piece of language, processes 1–3 deal with encoding the spoken message into language and are termed *lower-level*

processes. They are seen as occurring in the pre-comprehension stage. Processes 4 and 5 deal with building meaning, whereby comprehension occurs as the listener deals with pieces of information. These are termed *higher-level processes*. Although they are discussed serially, as Field (2013) emphasises, these processes often interact closely, and in parallel, during listening. The following paragraphs discuss these processes at both lower and higher levels.

Lower-level processes

Based on Field's model, listening begins with the *decoding* process, whereby competent listeners draw on their phonological knowledge to match the acoustic properties of phonemes to the phonological system of the language being heard. Listeners convert these speech-like sounds into sound representations and then use them to access their mental lexicon. *Lexical search*, the next lower-level process, divides sounds into spoken word forms and accesses these word meanings from the information in the lexicon. During this process, listeners must access information about a word's spoken form in their long-term memory (LTM) and work out word boundaries by exploiting 'prosodic cues' (Field, 2013, p.98). The output of this lexical process is a string of content and function words; however, the meanings attached to some content words can only be verified when a syntactic structure for a group of words is complete. After this lexical search, parsing occurs. *Parsing* involves assembling a syntactic structure – the standard word order – for a group of words that needs to be held in one's working memory (WM) to obtain an abstract, literal interpretation of an idea ('a proposition'). It is the parsing output that replaces the quickly forgotten exact linguistic surface/form. Further, listeners are assisted by using intonation group boundaries, namely, an end indicated by a pause, a fall in pitch or the use of focal stress to indicate that the speaker has completed a full grammatical structure.

Higher-level processes

According to Field (2013), meaning and discourse construction are the two processes that are applied in the higher-level stage. The *meaning construction* process requires the listener to place lower-level output – the literal meaning from utterances (propositions) – into the circumstances in which it is uttered (context) to determine its complete and relevant meaning. It can be assumed that a large amount of shared knowledge between speaker and listener is assumed and not mentioned. Thus, the

listener must apply different types of information to the raw meaning of a speaker's words to understand what is uttered in different ways. Using pragmatic knowledge, the listener interprets the speaker's intended meaning by going beyond words. Using contextual and semantic knowledge, the listener connects meaning propositions to the context in which those meanings are uttered by making use of a) world knowledge, whereby the listener matches the linguistic input with what is known about the real world, and b) recall of what has been uttered already (a co-text). Additionally, the listener may add details to infer implicit information and link anaphors (pronouns) to their antecedents. The final process is *discourse construction*. Here, the listener must connect the meaning-construction output labelled 'meaning representation' to the 'ongoing discourse representation' (Field, 2013, p.102). The latter is gleaned from the text that the listener is hearing.

Based on Van Dijk and Kintsch (1983), Field (2013) states that discourse construction requires the listener to direct his/her attention to 'choose', 'combine', 'compare' and 'construct' information. 'Selection' involves the listener's decision about the relevance of each piece of information. For example, the listener may formulate questions such as: 'Is the information relevant to an earlier detail?' or 'Does the information make a key or peripheral point about the topic currently being heard?' Based on these decisions, the listener may retain a piece of information in a generalised form or a detailed form, or simply forget it. 'Integration' occurs when the listener recognises a conceptual (explicit or implicit) link between an incoming piece of information and a point made immediately before it. 'Self-monitoring' involves the listener checking for consistency when comparing the comprehension of new information to what came before. If it is inconsistent, the listener needs to question whether the new understanding is correct and recall what was uttered before (metacognition). Finally, following Gernsbacher (1996), since spoken discourse is usually hierarchical (some points being more important than others), 'structure building' involves imposing a hierarchical pattern on what has been uttered.

Field (2013) stresses that these processes are usually employed by both L1 and L2 competent listeners in non-test conditions (real-world processing). Less-skilled listeners, he warns, do not often activate these processes. Thus, successful listening relies on both lower-level and higher-level processes, and deficiencies in either

linguistic knowledge (lower-level processes) or, for example, cultural knowledge (higher-level processes) can affect listening performance. Hence, when writing about tests, Field (2013) argues that a listening task should elicit as many processes as possible resembling those that will be activated by the listener in a real-world context.

Generally, Field's model is based on models developed in a language-testing context, such as Khalifa and Weir's (2009) reading model. Field's model seems to be influential; however, compared to Khalifa and Weir's, it does not seem to cover some aspects of processing behaviours that might be needed in real-world listening. Consequently, this review includes Khalifa and Weir's (2009) cognitive reading processing model. Although listening is seen as being more cognitively demanding than reading (Buck, 2001; Bloomfield et al., 2011), it has been claimed that they share several fundamental characteristics (Anderson, 2009; Vandergrift & Baker, 2015). Vandergrift and Baker (2015) mention that both listening and reading draw on linguistic knowledge and world knowledge. They both involve bottom-up and top-down processing, and success in both can be influenced by factors such as motivation and metacognition. Moreover, as Orta (2006) argues, lectures are generally considered to be 'a hybrid academic genre' (p.137) positioned at the interface of an oral-literate cline, where 'oral' exhibits spoken-discourse characteristics (e.g. everyday lexis) and 'literate' exhibits written-discourse characteristics (e.g. lexically dense). So, examining Khalifa and Weir's reading model can provide a more fine-grained understanding of processes required for listening.

2.3.2.2 Khalifa and Weir's (2009) cognitive processing model for reading

Bax (2013) states that Khalifa and Weir's model is particularly 'valuable', and empirical evidence for the processes identified by Khalifa and Weir has also been found in, e.g., Brunfaut and McCray (2015) and Owen (2015). Khalifa and Weir's model consists of three fundamental components: metacognitive activity, central processing and the knowledge base, as described here.

According to Khalifa and Weir (2009), metacognitive activity involves learners setting goals, self-monitoring and remediating when necessary. Goal setting refers to the reader first making decisions about the appropriate type of reading to complete a task, because the reading type decided upon will often determine which processes in

the central processing component are needed for comprehension. Reading may take place at either the local or the global level. The local level concerns comprehending propositions at the sentence/clause level (a microstructure level), which is usually associated with lower-level processes. In contrast, global reading involves understanding information presented beyond the sentence/clause level (a macrostructure level), which requires understanding information presented in the overall text, identifying main ideas/macro-propositions and making links between different individual ideas. In addition to local and global reading, there are two more reading types: careful reading and expeditious reading. Careful reading requires the reader to extract the complete meaning of most of the information presented at the local and/or global levels. Expeditious reading requires the reader to extract necessary information quickly and selectively. Expeditious reading, unlike careful reading, does not necessarily require a clear/coherent macrostructure-level understanding. The reader also needs to self-monitor comprehension and deal with any problems by performing remediation when necessary.

The central processing involves eight processes: the lower-level processes of *word recognition*, *lexical access*, *parsing* and *establishing propositional meaning*, and the higher-level processes of *inferencing*, *building a mental model*, *creating a text-level representation* and *creating an intertextual representation*. Each one is described below.

Lower-level processes

According to Khalifa and Weir, the central processing begins with *word recognition*, which requires the perception of visual printed letters (orthographic processing), along with 'sounding out the words in mind (phonological processing), and making use of information on expected grammatical forms (morphological processing)' (Brunfaut & McCray, 2015, p.6). *Lexical access* requires retrieving a lexical entry from words stored in the mental lexicon. *Syntactic parsing* involves assembling a grammatical structure for a group of words to obtain an abstract interpretation of a single unit of meaning. Thus *establishing propositional meaning* is considered to be parsing output and the next process in the model.

Higher-level processes

Higher-level processes include *inferencing*, which requires the reader to go beyond literal comprehension and add information not stated explicitly. During this process, the reader may bring world knowledge, topic knowledge and meaning representation of the text presented so far to achieve coherence. Inferencing may also occur at an earlier stage of reading, at the word level, when a reader, for example, confronts a homograph or ambiguous word and must guess its meaning from the context. Inferential processing is also required for anaphor resolution.

The next process is *building a mental model*. To build a mental model, the reader needs to integrate new information (a proposition) with what has gone before to enrich the proposition and establish an ongoing meaning representation that is subject to revisions/updates based on new, incoming information. During this process, the reader also attempts to establish a hierarchical base. The reader makes sense of an individual proposition, which is then stored and simultaneously integrated with all the propositions in WM to establish cohesion and continuously build the macrostructure of the text. This leads to the process, *creating a text-level representation,* in which the reader uses his/her genre knowledge to identify text structure and further integrate the information just read into a hierarchy of propositions in terms of its centrality to the text meaning.

The last process is *creating an intertextual representation,* which requires processing beyond that required to comprehending a single text. Khalifa and Weir, based on the work of Lacroix (1999), state that creating an intertextual representation process, which involves understanding multiple passages in a specific domain, may require two levels of macrostructural processing to obtain a coherent, condensed representation of multiple texts: constructing a macro-structure level from a single text and constructing a macro-structure level by identifying higher-level semantic links between a text being read in real time and previously read topics/passages. Then, this information is integrated into a 'super-structure' (Lacroix, 1999, p.230).

Khalifa and Weir's model deals with orthographic processing (printed text), but it does not handle the phonological processing that listening entails, a process included in Field's model. Further, all the processes Field includes have to be used in real time, unlike when reading, which allows the reader to revisit parts of the text. Additionally, Khalifa and Weir differ from Field in the number of processes included. Most directly

related to this study, Khalifa and Weir extended their model by adding 'creating intertextual representation' that is developed based on reading multiple texts. This is an important aspect of real-world learning, requiring students to combine and integrate information from different materials and study activities to understand a topic, thereby building a well-articulated mental model of a given subject or what is called *content knowledge about a specific domain* (Stahl, Hynd, Britton, McNish, & Bosquet, 1996, p.433). Field (2013) does not include it because he focuses exclusively on listening to a single text. Thus, the process of creating an intertextual representation in Khalifa and Weir's model is added to this study's model. Intertextuality, in this study, refers to those activities accompanying the listening modality that are likely to affect how an individual listens in a lecture. Meanings generated from a lecture may derive not only from that lecture but also from relationships generated between that lecture and other (spoken and/or written) texts made during listening, or even written/aural texts a listener has encountered before listening or even expects to encounter later in real-life situations (Flowerdew & Miller, 2005). Here, intertextuality refers to situations in which a listener needs to understand multiple lectures as part of one course(s) in their field, involving recalling some preparatory reading, taking notes, reading a handout or looking at slides during a lecture, or post-lecture, e.g. completing a written assignment or participating in a tutorial, and later sitting an exam, as Flowerdew and Miller (2005) discuss.

While both Field (2013) and Khalifa and Weir (2009) clearly describe comprehension as consisting of several cognitive processes working simultaneously, some listening literature suggests a distinct approach to understanding listening comprehension. Although Field (2013) and Khalifa and Weir (2009) include a description of the functions of processes, their models seem to lack a fully elaborated analysis of the skills or, more specifically, the sub-skills that make up these processes. It is commonly recognised that listening is 'a complex cognitive skill' (Vandergrift & Goh, 2012, p.33) that is difficult to define precisely (Wagner, 2004), and listening is thus commonly conceptualised as a 'multidimensional' process (Aryadoust, 2013, p.13; Buck, 2001, p.51; Buck & Tatsuoka, 1998, p.119; Song, 2008, p.436). For this reason, scholars have attempted to deconstruct L2 listening into 'constituent elements (i.e. sub-skills)', as mentioned by Goh and Aryadoust (2014, p.2), Buck (2001), and Wagner (2004). Goh and Aryadoust (2014) state that underlying the research on

processing sub-skills is the assumption that a listener will learn how to build a repertoire of sub-skills to achieve effective comprehension when listening components are identified and operationalised in a listening curriculum/test. Goh and Aryadoust (2014) thus recommend that instructors developing listening materials should focus on sub-skills, emphasising that 'learners who receive helpful skill-based instructions on preparing for academic lectures would perform better at the comprehension of lectures and tutorials' (p.4). Complementing a process model with a sub-skills approach makes sense. To support this view, this section reviews relevant research on listening sub-skills that focuses on the identification and divisibility of sub-skills in order to provide a more comprehensive view of what L2 listening processing may entail.

2.3.2.3 Proposed L2 listening sub-skills taxonomies

This section reviews a number of listening sub-skills that can be identified, as Aryadoust (2013) and Buck (2001) state, using taxonomies derived via either theoretical speculation or research. These sub-skills taxonomies are different in several ways from the two process models reviewed above, which focus purely on cognitive processes. In the sub-skill view, these taxonomies examine listening sub-skills that may not 'exist within the listener' (Buck, 2001, p.59); rather, sub-skills are probably just 'useful ways of describing what we do when we comprehend language' (Buck, 2001, p.257). Goh (2014) and Vandergrift and Goh (2012) also point out that listening (sub-)skills are abilities that do not require much conscious attention and are acquired through practice and experience.

Speculative taxonomies

There are a number of speculative listening sub-skills taxonomies, e.g. Field (2008a), Jordan (1997), Munby (1978), Oakeshott-Taylor (1977), Richards (1983), Rost (1990) and Weir (1993). Amongst those, Richards' (1983) taxonomy of microskills[8] is considered influential because it was one of the earliest and most thorough lists focusing on listening per se (Aryadoust, 2013; Flowerdew, 1994), and it differentiates between the microskills needed for conversational and academic listening. Richards (1983) proposed 33 microskills for conversational listening and 18 for academic

[8] Terms are taken as stated in the original source.

listening. Amongst those necessary for academic listening are the abilities to 'identify topic of lecture and follow topic development', 'identify relationships among units within discourse (e.g. major ideas, generalizations, hypotheses, supporting ideas, examples)' and 'knowledge of classroom conventions (e.g. turn taking, clarification requests)' (pp.229–230). Nevertheless, the problem with these taxonomies is that their validity has not been empirically tested (Aryadoust, 2013; Goh & Aryadoust, 2014; Wagner, 2004).

Research-based taxonomies

In contrast to theoretical-speculative taxonomies, research-based taxonomies have emerged from studies attempting to find evidence for the identification and divisibility of listening sub-skills, using primarily statistical methods and analyses of test data (Goh & Aryadoust, 2014). According to Sawaki, Kim and Gentile (2009), one of the earliest research-based taxonomies was the psychometric listening model using rule-space methodology, developed by Buck and Tatsuoka (1998) and Buck et al. (1997). Based on an analysis of a listening test completed by Japanese college students, Buck and Tatsuoka noted 15 cognitive 'attributes'[9] that explained virtually all the variance in the listeners' performance on the test. Amongst the identified attributes were the abilities to: scan text automatically in a fast manner; process scattered ideas; identify redundancy; and comprehend ideas that had no literal translation in the L1. These findings seem to suggest that listening sub-skills are separable and can be measured independently.

However, research examining the identification and separability of academic listening has yielded mixed findings. For example, Wagner (2004) proposed a general L2 listening model but was unable to derive definitive support for his model using exploratory factor analysis (EFA). Drawing on the default listening construct described by Buck (2001), Wagner's model encompasses two listening factors: the ability to understand explicitly stated information and the ability to understand

[9] Buck and Tastsuoka (1998) state that terms such as *sub-skills, skills, processes, knowledge* and *levels of processing* are used interchangeably in the literature. Writing about listening tests, they advocate the use of the term *attribute* to refer to 'anything that affects performance on a task' (p.121). Buck (2001) uses the term *subcomponents* to refer to sub-skills. Aryadoust (2013) indicates that since listening is often viewed as a multidimensional process, the term *dimension* appears frequently, often in assessment contexts, although with different definitions. In contrast, the term *sub-skill* has been used in applied linguistics, and there, dimensions are equivalent to 'listener-related attributes' (Aryadoust, 2013, p.61).

implicitly stated information. Wagner proposed measuring these independently using two academic listening sections (MELAB and ECPE). Wagner found that listening to comprehend implicit ideas must concurrently involve listening to explicit words, which helps the listener to make inferences and grasp implicitly articulated information. This led Wagner to conclude that sub-skills may not be divisible, and determining listening abilities statistically may not be easy. Liao (2007) continued by examining the validity of Wagner's (2004) explicit/implicit model, and using EFA and confirmatory factor analysis (CFA) to analyse data from an ECCE listening test; some evidence was found suggesting that listening consists of two separate factors. Meanwhile Liao's CFA produced some evidence supporting the hypothesised model, the correlation coefficient between the two factors was .97. Liao contends that this finding, although indicating the two factors are interconnected, still signals that they are nonidentical. Goh and Aryadoust (2014), on the other hand, argue that these two listening abilities/factors are scarcely divisible.

Contrary to the two aforementioned studies, Goh and Aryadoust (2014) find that the sub-skills proposed as essential for academic listening are both divisible and interconnected. Based on an item content analysis of a now-retired version of the MELAB, they posited a five-factor model to underlie this test performance. The five factors comprising the model are: (a) understanding and responding to unexpected statements and/or questions, (b) understanding details and explicit information, (c) making close paraphrases, (d) making propositional inferences, and (e) making enabling inferences. Their simple, five-factor, 36-item CFA, in which 14 out of 50 items were deleted due to low regression coefficients, found that these listening sub-skills are indivisible, as indicated by the extremely high correlations among the factors. Goh and Aryadoust tested their model further by performing a higher-order, aggregate-level, 23-model CFA (a more complex statistical method), in which they found there is a higher-order factor, general listening, that predicts lower-order, latent variables, i.e. the five sub-skills identified. Thus, these lower-order factors are posited as subcomponents of, or regressed on, the higher-order factor. Also, prediction relationships amongst the factors were inserted. Their model fits the data, providing support for the idea that listening sub-skills can be discriminable and may operate in an interactive and interdependent manner. The overall conclusion Goh and Aryadoust drew stresses that 'listening performance is attributable to the presence of a general

listening ability … [and] the identified sub-skills might not operate in isolation but in unison to facilitate achieving a listening comprehension goal' (p.16).

This review suggests, as Buck (2001) indicates, that there is a general consensus that listening involves various processing sub-skills that can be viewed from distinct perspectives, but these sub-skills are not precisely known (Buck & Tatsuoka, 1998). Furthermore, as Alderson (2000) states, 'whether separable comprehension sub-skills exist, and what such sub-skills might consist of and how they might be classified' (p.10) has been and continues to be a matter of debate. Similarly, which and how many psychometric factors underlie L2 comprehension is a bone of contention (Sawaki et al., 2009). Nevertheless, Goh and Aryadoust (2014) assert that this research line – the notion that listening consists of sub-skills – will continue to be an area for research.

Aryadoust et al.'s (2012) model, which is a sub-skills model, is also relevant to this study. As Aryadoust et al. emphasise, abilities such as WM and concentration are considered necessary for listening to lectures, which are 'high-attention situations' (Field, 2013, p.111), as is note-taking, which removes the need for the listener to retain all the information said in memory. Including Aryadoust et al.'s model can shed light on dimensions that might determine successful academic listening that are not captured by the models reviewed: listeners' language ability, WM and concentration, note-taking and lecture structure.

2.3.2.4 Aryadoust, Goh and Lee's (2012) L2 academic listening model

Drawing on speculative taxonomies of listening sub-skills (Jordan, 1997; Powers, 1986; Richards, 1983), Aryadoust et al. posit an academic listening model divided into two main sections. As can be seen in Figure 2-2, the top section is a general listening model comprising *cognitive processing skills, linguistic components and prosody,* since academic listening is partly made up of general listening. Below that is the academic listening model comprising the two components of general listening and four additional dimensions: *relating input to other material*, *memory and concentration*, *note-taking* and *lecture structure*. This model was the baseline for the Academic Listening Self-rating Questionnaire that was created to assess 119 ESL

international students' academic listening; the students studied at different universities, with different course levels and disciplines.

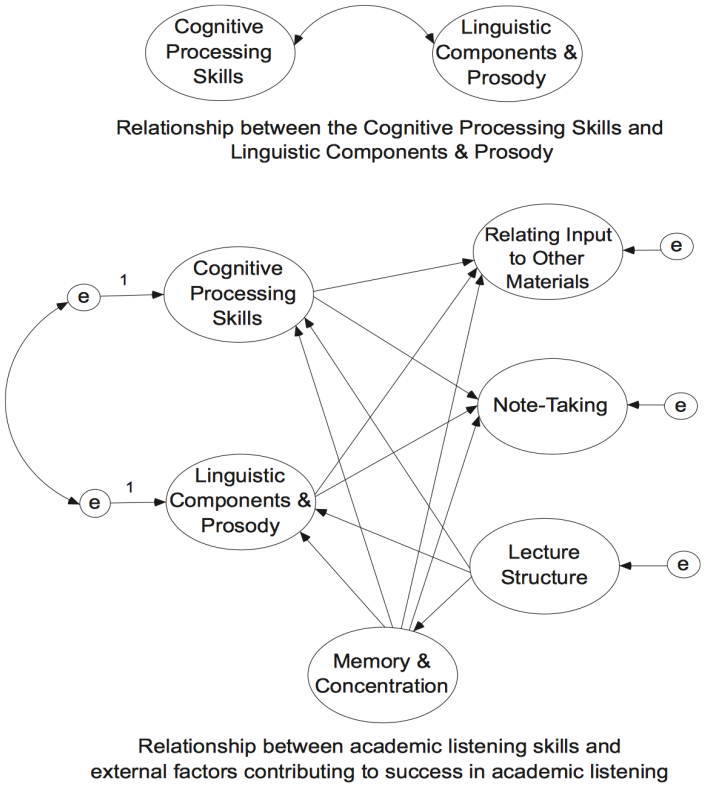


Figure 2-2: The academic listening model by Aryadoust et al. (2012, p.233)

The researchers found supportive evidence for the content-related, substantive and structural validity of their model and the causal and correlation relations amongst the model's sub-skills. They detected that general listening predicted note-taking and relating input to other materials, and that lecture structure may influence WM and concentration; students' attention may be lower with certain lecture structures.

Although not comprehensive, Aryadoust et al.'s model synthesises the major sub-skills based on what is currently known about the complex academic listening construct. However, given the current study's interest in lecture listening, the ways that lectures are organised should be considered to elaborate further on the processes tapping into text structure in Field's and Aryadoust et al.'s models. Looking at Young's (1994) lecture structure model can provide an understanding of how lectures are organised.

2.3.2.5 Young's (1994) lecture structure model

Young's (1994) framework has been considered appropriate for analysing different types of lectures across disciplines (Aryadoust, 2013; Flowerdew, 1994; Bejar et al., 2000). According to Young (1994), the analytical unit of this framework is a 'phase', which refers to the different strands of discourse (a strand is like a speaker announcing a direction). These phases/strands are expected to recur during a lecture (although not in the same order and quantity in each lecture), though some might be prominent and some absent. Young (1994) argues that this phasal analysis offers 'a more realistic portrayal of the nature of this particular genre' (p.173); thus, it is considered to be more accurate than the traditional organisation of the lecture structure, which has an introduction, a middle/body and a conclusion. Young's model reveals three phases (1, 2 and 3) that constitute the macrostructure of a lecture and three phases (4, 5 and 6) that serve as micro-features composing that macrostructure:

Macrostructure

1. The *discourse structuring* phase occurs when a speaker informs listeners about the direction he/she will follow during the lecture. This may be signalled by a verb (e.g. give) followed by a noun about what will come next (e.g. a list of words), and pronouns ('I', 'we') to engage listeners. During this phase, the speaker may also use commands ('so now let's look at') or modals of intention and prediction (I'll explain) to focus on information and alert listeners to what is coming.
2. The *conclusion* phase occurs when the speaker summarises earlier points to ensure listeners have grasped the content. During this phase, key concepts and terms may often be repeated.
3. The *evaluation* phase is not as frequent as the two aforementioned phases. It involves the lecturer explicitly evaluating the content (disagreement or personal endorsement) ('very important') to help listeners weigh the points made.

Micro-features

4. The *interaction* phase reveals the amount of the contact initiated and maintained by the speaker with their listeners to reduce the distance between them.
5. The *theory/content* phase is when theoretical information (definitions, models, theories) is presented.
6. The *exemplification/examples* phase involves the speaker presenting familiar examples to explain theoretical concepts.

2.3.2.6 Vandergrift and Goh's (2012) L2 listening comprehension cognitive model

Despite the fact that all the models reviewed so far clearly specify processes and sub-skills that enable the listener to perceive and understand language in a real-world academic context, these descriptions are primarily pertinent to fluent listening processing, as in L1 listening. Furthermore, many of their aspects do not relate to L2 listening and sometimes extend to include aspects that can be seen in L2 listening, such as inferring a new word's meaning in Khalifa and Weir (2009), self-monitoring, although in a partial manner, in both Khalifa and Weir (2009) and Field (2013) and L2 language proficiency in Aryadoust et al. (2012); they exclude consideration of strategic processing, which might affect L2 processing (e.g. Goh, 2002). Anderson (2009) explains that the development of a skill typically comprises three stages: 1) a cognitive stage, in which individuals, when first performing a skill, memorise facts relevant to the skill being developed, but using this knowledge might be slow because knowledge is still in a declarative form; 2) an associative stage, in which mistakes are gradually eliminated and connections between the different elements of performing a skill are strengthened; and 3) an autonomous stage, in which procedures to perform a skill become more automatic and rapid. This principle also applies to L2 listening, since researchers such as Cutler (2012) and Rost (2014) claim that any language learned after adolescence presents challenges that are not encountered in the language(s) used during childhood, including listening. Although the processes of native listening may be the same as those deployed in non-native listening, the latter may be more challenging than the former (Cutler, 2012). Difficulties while non-native

listening might occur and emerge for many reasons (e.g. poor language mastery, insufficient background knowledge), as indicated by Goh and Aryadoust (2016), and listeners might then need to use strategies to solve problems and enhance their listening (Macaro, Graham & Vanderplank, 2007; Goh & Aryadoust, 2016). Vandergrift and Goh's (2012) cognitive model for L2 listening specifically seems to enhance our understanding of strategic processing. In their model, listening is composed of two major processing types: cognitive processing and metacognitive processing.

Cognitive processing, based on their perspective and drawing on Anderson's (1995) language comprehension framework, comprises speech perception, parsing and utilisation. These various processes occur rapidly, automatically and simultaneously and require little conscious attention to move back and forth between bottom-up processing and top-down processing to achieve comprehension. Successful L2 listeners, however, depending on their L2 proficiency and familiarity with the text topic, might need to focus consciously on some aspects of input and control/regulate these cognitive processes using their metacognitive knowledge. Metacognition, as Vandergrift and Goh (2012) define it, is 'our ability to think about our own thinking or "cognition" … [and] to think about how we process information for a range of purposes and manage the way to do it' (pp.83–84). Metacognition thus involves a state of consciousness that can be seen in the use of strategies to control cognitive processes engaged in comprehension or learning. Therefore strategies, regardless of their type, are generally considered to be 'metacognitive', because they enable the learner (or listener) to change deliberately the way they use and learn language. Vandergrift and Goh specify four metacognitive processes to regulate cognitive processes. They stress that these metacognitive processes may interact in different ways, and they may occur automatically or in a controlled way, depending on the listener's L2 proficiency:

1. *Planning for the listening activity* refers to the processes employed by listeners when preparing themselves for what they expect to hear to establish the conditions necessary for successful listening. Planning metacognitive processes might involve listeners a) bringing to their consciousness relevant topical knowledge and cultural knowledge, b)

predicting words/ideas they may hear, c) preparing themselves by clearing their minds and focusing their attention, and d) anticipating what they will hear based on information brought to their consciousness or any appropriate contextual information.

2. *Monitoring comprehension* occurs when listeners monitor their comprehension and make necessary adjustments while listening. Monitoring comprehension processes may include listeners a) continually evaluating what they have grasped, b) checking the appropriateness of their predictions against their ongoing interpretations of the text and world knowledge, c) verifying their invalid predictions and accepting facts such as that they do not have to understand every word, d) assessing their understanding of the desired information and important details and e) assessing the effectiveness of their listening approach.
3. *Solving comprehension problems* is the process by which listeners have to modify their understanding approach and activate appropriate strategies when confronting difficulties, e.g. a) revising predictions, b) adjusting inferences to allow new possibilities, and c) making inferences regarding a chunk of text not grasped from information listeners feel confident they have understood.
4. *Evaluating the approach and outcomes* refers to the process by which listeners, after listening, evaluate the effectiveness of their while-listening approach.

The previous four models (Field, Khalifa & Weir, Aryadoust et al., Young) focus exclusively on automated processes and sub-skills, but Vandergrift and Goh (2012) acknowledge the role of strategic processing in L2 listening and highlight the concept of metacognition, which requires the use of strategies to improve comprehension, particularly when the listener's L2 language is limited. Consequently, L2 listening processing seems to trigger cognitive processes, sub-skills and strategies to achieve comprehension goals.

The next subsection presents studies examining the strategies used by listeners at different language proficiency levels and the academic listening strategies listeners may use to compensate for their linguistic inadequacies.

2.3.2.7 Impact of cognitive and metacognitive strategies on L2 listening comprehension

Research suggests that L2 listening strategies generally play a key role in successful comprehension and solving problems (Graham, 2003; Vandergrift & Goh, 2012). Several studies have identified and classified the listening strategies employed by learners to construct meaning when responding to listening tasks in non-interactive contexts (DeFillipis, 1980; O'Malley et al., 1989; Lavisoa, 1991; 2000; Vandergrift, 1997, 2003; Goh, 2002; Rukthong, 2016), while others have explored NNS students' lecture-listening strategies in TLU situations (Benson, 1989; Mason, 1994; Lynch, 1995, 1997; Imhof, 1998).

O'Malley et al. (1989) differentiated the strategic processing used by 'effective' versus 'ineffective' Spanish-speaking intermediate learners of English when listening to recorded lectures and associated the strategies identified with Anderson's model. Think-aloud protocols revealed that, during perceptual processing, effective listeners employed a 'self-monitoring strategy' (selective attention, directed attention) by directing attention when distracted. Meanwhile, ineffective listeners were unable to self-monitor their attention; rather, they readily stopped listening when distracted (either when encountering an unfamiliar word or phrase or when engaging in overelaboration when a text reminded them of something they knew too well, causing them to recall their prior knowledge in a way that made them unable to maintain their attention that wandered easily). During parsing, effective listeners also used a 'grouping'[10] strategy that is critical for listening to larger chunks of words, and involves 'concatenating' segments together to construct overall meaning, in contrast to the less effective listening behaviour on a word-by-word basis. Effective listeners also employed 'inferencing' to infer new words' meanings using context. Finally, during utilisation, effective listeners used an 'elaboration' strategy by relating new information to their prior world knowledge to aid comprehension and recall. They also engaged in 'self-questioning'. In contrast, ineffective listeners rarely related new information to their prior knowledge through inferencing and elaboration.

However, there are studies that contradict some of O'Malley et al.'s findings. For example, Graham (1997) (cited in Graham, 2003) found that less proficient listeners,

[10] Term from Vandergrift (1997).

who recognised few words automatically, depended heavily on inferencing from context, although they usually heard words/phrases not in the text. Graham (2003) mentioned that those less proficient listeners adopted a 'perseverative text processing strategy' in which they constructed an initial hypothesis about a passage's overall meaning by means of (inappropriate) inferencing from context and then 'adhere rigidly to this interpretation even when there is disconfirming evidence later in the text' (p.65). Likewise, Field (2008b) looked at how Arabic learners of English handled incomprehensible phonetic sequences. Based on analyses of transcripts, the participants: 1) phonologically approximated the imperfectly heard word to a word similar in form (even if that match was not syntactically or semantically accurate in the co-text and/or context); 2) approximated the word to a known word; 3) captured its orthography; 4) simply ignored the lexical item altogether. Field concluded that L2 listeners do not always exploit the surrounding text to guess unfamiliar words. Rather, they restructured the text and its meaning to make it fit what they believed was a correct match for the word in question.

Using a think-aloud procedure, Vandergrift (1997) found that 'novice-level' French learners depended heavily on transfer (cognates) and extralinguistic cues (e.g. voice tone) to infer meaning and overcome their insufficient linguistic knowledge. Using transfer and nonlinguistic cues allows listeners to allocate some attentional resources in WM to activate world knowledge that can guide their interpretation (inferencing). Meanwhile, 'intermediate-level' listeners reported using metacognitive strategies (comprehension monitoring, problem identification, selective attention) at twice the rate of novice-level listeners. Vandergrift (1997) argued that constraints on attentional resources and processing may not allow novice-level listeners to simultaneously hold words understood in WM to parse them for more meaning and evaluate the congruency of newly understood information with preceding information that has been understood. This leaves little room in WM for 'deeper processing strategies', i.e. metacognitive strategies, which skilled listeners tend to employ. For novice listeners, 'inefficient surface-level processing strategies' such as translation and transfer might replace metacognitive strategies (Vandergrift, 1997, p.400). This finding concurs with that of Vandergrift (2003), who concluded that a skilled listener who uses more metacognitive strategies, especially comprehension monitoring, 'is in control of the listening process' (p.485).

Other studies have examined the lecture comprehension strategies that students tend to use to compensate for their weaknesses in English (Mason, 1994). Based on analyses of notes and interviews with an Arabic-speaking student, Benson (1989) identified some strategies the student used to comprehend his mini-lectures delivered in English, which include: reducing the amount of incoming linguistic data by identifying only main points and ignoring subsidiary points (e.g. those points exemplifying or reformulating main ideas), exploiting the lecturer's meta-language used to structure the lecture, connecting new information with already familiar information and localising lecture ideas to his home country, identifying the lecturer's viewpoints and focusing on information that might appear in the exam.

Lynch (1995) also investigated the interactive listening strategies of learners attending a seminar in an EAP pre-sessional course. Lynch noted that two types of questions were used as an interactive listening strategy: questions to resolve a comprehension problem (e.g. confirmation check) or questions to move the discourse forward through the elaboration or expansion of previous utterances. Lynch found that students' uncertainty enabled them to use these questioning strategies to solve comprehension difficulties. Lynch attributed using questioning, as a strategy, to sources of difficulties, such as listeners' inability to: identify speaker's pronunciation; interpret an unfamiliar use of a known word; infer unfamiliar lexis; recognise cohesive devices; and interpret propositional meaning.

In summary, listeners use different cognitive and metacognitive strategies (Macaro et al., 2007) to solve comprehension problems and control cognitive processing (Vandergrift & Goh, 2012). Macaro et al. (2007), however, argue that success in using these strategies 'may be explained as much by greater linguistic knowledge as by anything else' (p.171). They state that proficient listeners seem to use both (certain) cognitive strategies, such as 'listening to chunks of language rather than focusing on individual words' and 'avoiding direct translation', and, importantly, metacognitive strategies, especially comprehension monitoring (Macaro et al., 2007, p.174). In proficient listeners' strategic processing behaviour, cognitive and metacognitive strategies work together, as found by Vandergrift (2003) in a flexible and effective combination approach (Graham, 2003) to facilitate a greater depth of interaction with the text and lead to successful comprehension (Vandergrift, 2003).

Less-proficient listeners, on the other hand, deploy more superficial bottom-up strategies (e.g. transfer, translation), as found by Vandergrift (1997, 2003) and O'Malley et al. (1989), and their strategic processing is characterised by an inflexible and unsystematic approach (Graham, 2003).

2.3.2.8 Common principles and differences of the study's text comprehension models

The review above presented various models to describe the intricate cognitive functions involved in (aural and written) text comprehension. This section compares the five preceding models to determine which aspects of these models are relevant to the present study.

Although different in several ways, Field (2013), Khalifa and Weir (2009), Vandergrift and Goh (2012) and Aryadoust et al. (2012) share some fundamental principles concerning comprehension in their descriptions of cognitive functions. For instance, Vandergrift and Goh (2012) use the terms bottom-up processing (segmenting input into meaningful units) and top-down processing (using prior knowledge and context to build a conceptual framework), which are equivalent to the terms lower- and higher-level processing used by Field (2013) and Khalifa and Weir (2009). Further, although Aryadoust et al. (2012) do not explicitly refer to these processing types, their 'cognitive processing skills' incorporate such aspects. These models thus clearly converge in terms of the need to apply two major processing types to emerging text interpretations, i.e. lower-level and higher-level, and these two processing stages interact in parallel ('parallel distributed processing', Vandergrift, 2004, p.4) with information that is processed automatically. Overreliance on one of these processing types might therefore be counterproductive (Aryadoust, 2013; Field, 2013).

Nevertheless, these models are distinct in several ways. For example, the classification and terminology of these cognitive functions involved appear to be different. Field's (2013) and Vandergrift and Goh's (2012) models are generally based on L1 language comprehension frameworks, e.g. Anderson's (2009) three-stage model consisting of perceptual processing (recognising sounds as words and meaningful language chunks), parsing (segmenting words into syntactic structures to

create the combined meaning of words) and utilisation (linking mental representations from perception and parsing to existing knowledge). Field (2013) further subdivides Anderson's processes into five processes and links each of these to a separate knowledge source. In contrast, Vandergrift and Goh's (2012) cognitive processing dimension remains the same as that of Anderson's. Khalifa and Weir's (2009) model incorporates more processes than Field (2013) or Vandergrift and Goh (2012). Khalifa and Weir (2009) include a fourth process, establishing propositional meaning, to lower-level processing because they distinguish between parsing process (assembling a syntactic structure for a group of words) and parsing output (obtaining a literal interpretation of a proposition), whereas Field (2013) has only one category, parsing. Inferencing (going beyond explicit words) is considered a core process by Khalifa and Weir, whereas Field includes inferencing as a sub-process of his meaning-building process. Field also does not include the process of creating an intertextual representation, most simply defined as 'linking texts' (Hartman, 1995, p.523), which is the last process in Khalifa and Weir (2009). Concerning diagrams representing models, that of Field (2013) comprises three separate models, and in his lower-level processing model, Field begins with decoding (top) before moving towards parsing (bottom), whereas Khalifa and Weir (2009) portray all the lower- and higher-level processes in a single diagram beginning with word recognition (bottom) and moving to intertextuality (top).

Moreover, Field (2013) and Khalifa and Weir (2009) focus purely on L1 and L2 expert processing; however, with reference to L2 listening literature, a different approach is also used when describing listening. This approach acknowledges deconstructing these cognitive processes into separate sub-skills, so that they can be targeted individually in listening teaching/testing materials (Goh & Aryadoust, 2014; Field, 1998). Aryadoust et al.'s (2012) model sheds light on the major sub-skills that might determine success in academic listening, which are lacking in Field's model, probably because such aspects are generally considered as listeners' characteristics, as Bloomfield et al. (2011) and Bejar et al. (2000) state.

Finally, Vandergrift and Goh (2012) focus on metacognition (strategy use) in L2 listening processing, whereas Field (2013), in particular, includes a self-monitoring sub-process under his discourse construction process. But Field does not seem to

focus explicitly on strategic processing, unlike Vandergrift and Goh (2012) who specify a major type for strategic processing along with cognitive processing that, as they argue, will help to teach listening more effectively. Field also deviates from other researchers' views such as Mendelsohn (1998), Graham (2003), Laviosa (2000), and Flowerdew and Miller (2005) who advocate teaching listening strategies explicitly. This might be because Field remains sceptical about strategies. Field (2008c) emphasises that the listening instruction goal should be to teach processing routines to learners as 'a form of expert behaviour' (p.3) and that strategies 'do not form part of expert listening' (Field, 2013, p.108). At the same time, Field (2013) notes that strategic competence can be seen as an essential component in L2 listening proficiency because, in fact, the effective use of strategies can help learners to expand their comprehension beyond their existing linguistic knowledge and expertise; hence, this can be part of 'the true nature of L2 listening' (Field, 1998, p.116). However, Field (2011) cautions that when strategies are incorporated into instruction, this should be done with a view to ensuring that learners are not made 'too strategic' (p.109).

The preceding discussion serves as the substantive basis for the present study's model, which will be presented next.

2.3.3 Proposed model for L2 academic lecture-listening processing

The lecture-listening processing model formulated in the present study and used to inform the analysis of its data synthesises two processing types. Cognitive processing consists of, as Figure 2-3 shows, *cognitive processes* and their constituent *sub-skills*. If no comprehension problems are encountered, this should lead to constructing a text representation, regarded as the final product of comprehension (Imhof, 2010). Strategic processing, on the other hand, entails using *cognitive and/or metacognitive strategies* when encountering a problem, and if a solution is achieved, it can lead to a text representation.

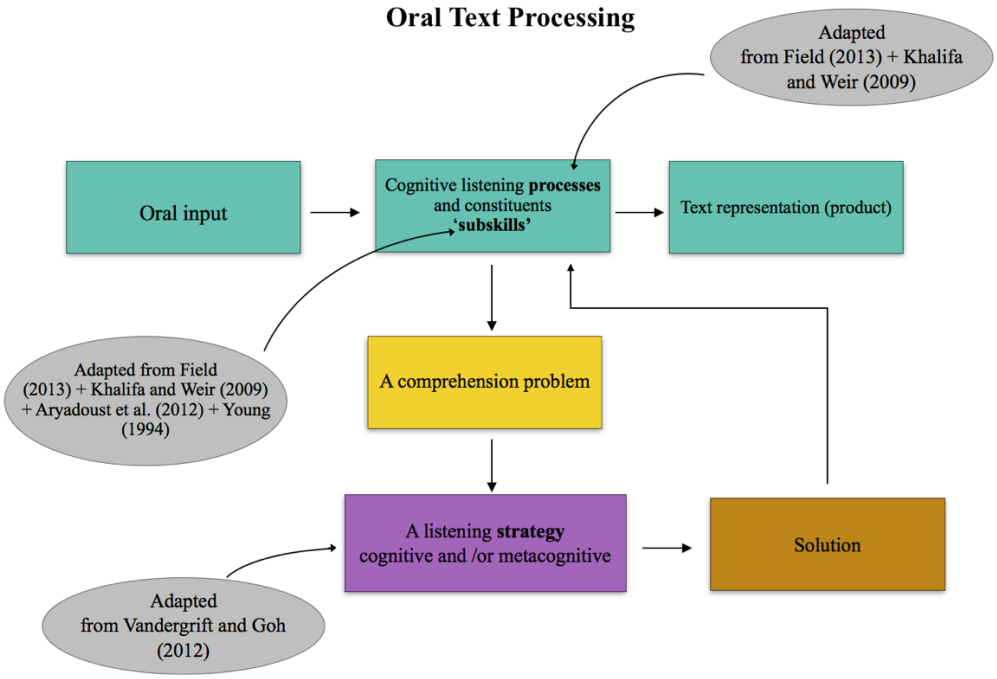


Figure 2-3: Components of L2 lecture-listening processing behaviour

Cognitive processes

Process, as Faerch and Kasper (1980) state, is opposed to linguistic product. Anderson (2009), based on information-processing theory, describes processes of both listening and reading as sophisticated, automatic mental steps in which an abstract entity, 'information', is processed to enable people to understand. Drawing on Field (2013) and Khalifa and Weir (2009), seven cognitive processes are identified in this study, as summarised in Table 2-1.

Table 2-1: Processes based on Field (2013), Khalifa and Weir (2009) and Field (2004a)

		Process	Listeners' typical cognitive operations	Size of typical unit[11]
1		***Input decoding***	This process entails identifying the acoustic shape of a word and linking it to the phonetic/phonological representation of words as found in the phonological system of the language being heard (so this also involves attributing pronunciation to words even if their meanings are not known)	Word

[11] Adapted from Bax (2013).

			(Field, 2004a, p.234).	
2	Lower-level processing	***Lexical search***	This process requires retrieving a 'lexical entry', from the mental lexicon, containing stored information about a lexical item when it is encountered: a word's form and meaning, such as its phonological (pronunciation) and orthographic (spelling) representation, morphology information (inflectional: a plural for a noun, a past tense for a verb as well derivational information e.g. –ness) (Field, 2004a, pp.151–154).	Word
3		***Syntactic parsing and establishing propositional meaning***	This process entails assembling a syntactic structure for a group of words according to a canonical (SVO) sentence structure while the utterance is still being processed, and then a final decision has to be made as to what has been uttered at the clause level to obtain an abstract, literal interpretation of an idea, i.e. 'a proposition', without the interpretative and associative factors a comprehender might bring to affect its interpretation (Field, 2004a, pp.297–300, p.225, Field, 2013).	Utterance
4	Higher-level processing	***Inferencing***	This process requires going beyond explicitly stated information and adding information not stated explicitly in the text to establish coherence. There are different types of inferencing. These may include pragmatic inference, which might require bringing world knowledge, or text-based inference (inferences between parts of the text) which requires bringing topic knowledge, and meaning representation of the text presented so far, to infer implicit meaning (Khalifa & Weir, 2009).	Utterance/paragraph/ aural text
5		***Building a mental model***	This process entails integrating new information (after a sentence/utterance is elaborated on during inferencing) into a developing mental representation of the text that is subject to revisions and updates based on new information. This process also requires identifying main ideas, relating ideas to previous ones, distinguishing between major and minor propositions and linking together the different propositions representing meaning so far while continuously building a macrostructure of the text (Khalifa & Weir, 2009,	Utterances/paragraph/ aural text

			pp.51–52; Field, 2004a, pp.241). Anaphor resolution can also be regarded as part of this process based on Field (2013).	
6		***Creating a text-level representation***	This process entails creating a discourse-level structure for the whole text just processed (as a final process) by recognising its propositions in a hierarchical structure in such a way that different parts of the text fit together and propositions are arranged in terms of their centrality to text meaning, so that an organised representation of the text including main and supporting points is created (Khalifa & Weir, 2009, pp.52–53).	A single aural text
7		***Creating an intertextual representation***	This process requires processing the meaning of a single text with meaning derived from multiple texts using the mechanisms of deletion, generation and selection of information to establish 'integrated representations of multiple texts' (Khalifa & Weir, 2009, p.53). With respect to lectures in a real-world situation, Flowerdew and Miller (2005) identify activities that might require employing this process, such as when recalling some preparatory readings, taking notes, reading a handout or looking at slides. Post-lecture, completing a written assignment or participating in a tutorial, and later sitting an exam.	Multiple textual/modal inputs

These processes are informed by knowledge sources, namely, linguistic, pragmatic, prior and discourse knowledge, that influence the quality and direction of cognitive processing (Vandergrift & Goh, 2012). Linguistic knowledge involves phonological (e.g. stress, elision), semantic (vocabulary) and syntactic (grammar) knowledge of the L2 (Vandergrift & Goh, 2012; Field, 2013). 'Cultural knowledge', as Field (2013) broadly labels it, also plays a role after the conversion of sounds into a proposition. Cultural knowledge includes pragmatic knowledge in which listeners interpret the speaker's intended meaning (Vandergrift & Goh, 2012; Field, 2013); prior knowledge, whereby the listener needs to match the linguistic input with what they know about things in the real world (Vandergrift & Goh, 2012); and finally, discourse/textual knowledge, which involves understanding a text's organisation (Vandergrift & Goh, 2012).

Processing sub-skills

In line with Grabe (2009), Goh and Aryadoust (2014) and Goh (2014), sub-skills are described as 'constituents' of cognitive processes. Sub-skills are automatic in fluent processing (Afflerbach et al., 2008; Field, 1998; Grabe, 2009; Vandergrift & Goh, 2012), but they are typically first developed through conscious processing and used to describe a process (Grabe, 2009). With reference to L2 reading, Grabe (2009) writes:

> In order for fluent word recognition to occur, a reader must recognize the word forms on the page very rapidly, activate links between the graphic form and phonological information, activate appropriate semantic and syntactic resources, recognize morphological affixation … These sub-skills represent a standard way to describe word-recognition skills. (p.221)

Hence, this study describes seven cognitive lecture-listening processes in terms of separate sub-skills. For example, a lexical search process is divided into sub-skills such as: allocating meanings to words, processing technical words and linking an aural word to its spelling.

Processing strategies

Although strategies are described as cognitive processes (Grabe, 2009), they are distinct from the automatic cognitive processes and the sub-skills mentioned above, as strategies are consciously controlled (Afflerbach et al., 2008; Grabe, 2009; Vandergrift & Goh, 2012; Farech & Kasper, 1980; Field, 1998) and are typically used to assist comprehension and learning (Vandergrift & Goh, 2012; Laviosa, 1991, 2000; Grabe, 2009) especially due to, as Goh (2002) states, L2 learners' lack of linguistic, content and sociolinguistic knowledge or WM overload. Grabe (2009) further adds that strategies 'may be on their way to becoming [automatic] [sub-]skills' (p.221).

In this study, listening strategies include *cognitive* and *metacognitive*. O'Malley and Chamot (1990) define cognitive strategies as those that directly operate on and manipulate incoming auditory information, whereas metacognitive strategies are higher-order executive skills used for planning, monitoring and evaluating the individual's understanding. Based on Vandergrift and Goh (2012) and Lynch (2009), cognitive strategies include: 1) *inferencing*, or using information from text to guess

unfamiliar words to fill in missing information (linguistic, voice, paralinguistic and kinesic inferencing); 2) *elaboration*, or using prior knowledge and linking it to text to embellish one's interpretation (world, personal, academic, visual elaboration); 3) *translation* when relying on L1 (e.g. verbatim mental translation or transfer); 4) *fixation*, or stopping to think about the spelling or meaning of words and phrases, or memorising what is being uttered; and 5) *prediction*, or anticipating the message content (global prediction, gist, local prediction/details). Metacognitive strategies, based on Goh (2002), include: 1) *prelistening preparation*, or preparing oneself mentally and emotionally for listening; 2) *selective attention*, or noticing specific aspects of the text (e.g. how information is organised, noticing repetitions); 3) *directed attention*, or monitoring comprehension by concentrating hard and continuing listening, despite difficulties; 4) *comprehension monitoring*, or verifying and checking current interpretations while listening and identifying problems; and 5) *comprehension evaluation*, or checking whether an understanding is accurate and acceptable after listening.

Processes, sub-skills and strategies

Based on existing models of listening and reading (see Section 2.3.2) and the data from this study, as shown in the results chapters (4–8), an L2 lecture-listening model was proposed as demonstrated in Figure 2-4. The model was developed in a back-and-forth fashion that attempted to align with models in the literature that fit and explain the data. Therefore, the model in Figure 2-4 shows that lecture-listening triggers seven processes (listed in the green boxes in the middle of the figure) and strategies (those indicated by arrows and the bracketed line combining the processes in the left refers to the fact that these strategies can be employed during these processes). The figure also includes an example of the sub-skills that make up the lexical search process in this study; not all the sub-skills for the processes are included here. Instead, the model presented in Figure 9-1 shows all sub-skills related to the processes as revealed by this study. Of note, there are two uses of the term 'inferencing' in this study. Inferencing as a process comes from Khalifa and Weir (2009), who refer to inferring an implicit meaning in a message to achieve coherence in understanding. Expert listeners use this process. Inferencing as a strategy comes from Vandergrift and Goh (2012), who refer to guessing or filling in missing

information in response to language problems. A listener may infer a word's meaning or use body language to infer something they do not understand linguistically; this is a strategy that L1 listeners do not often use, but certain L2 listeners do rely on it.

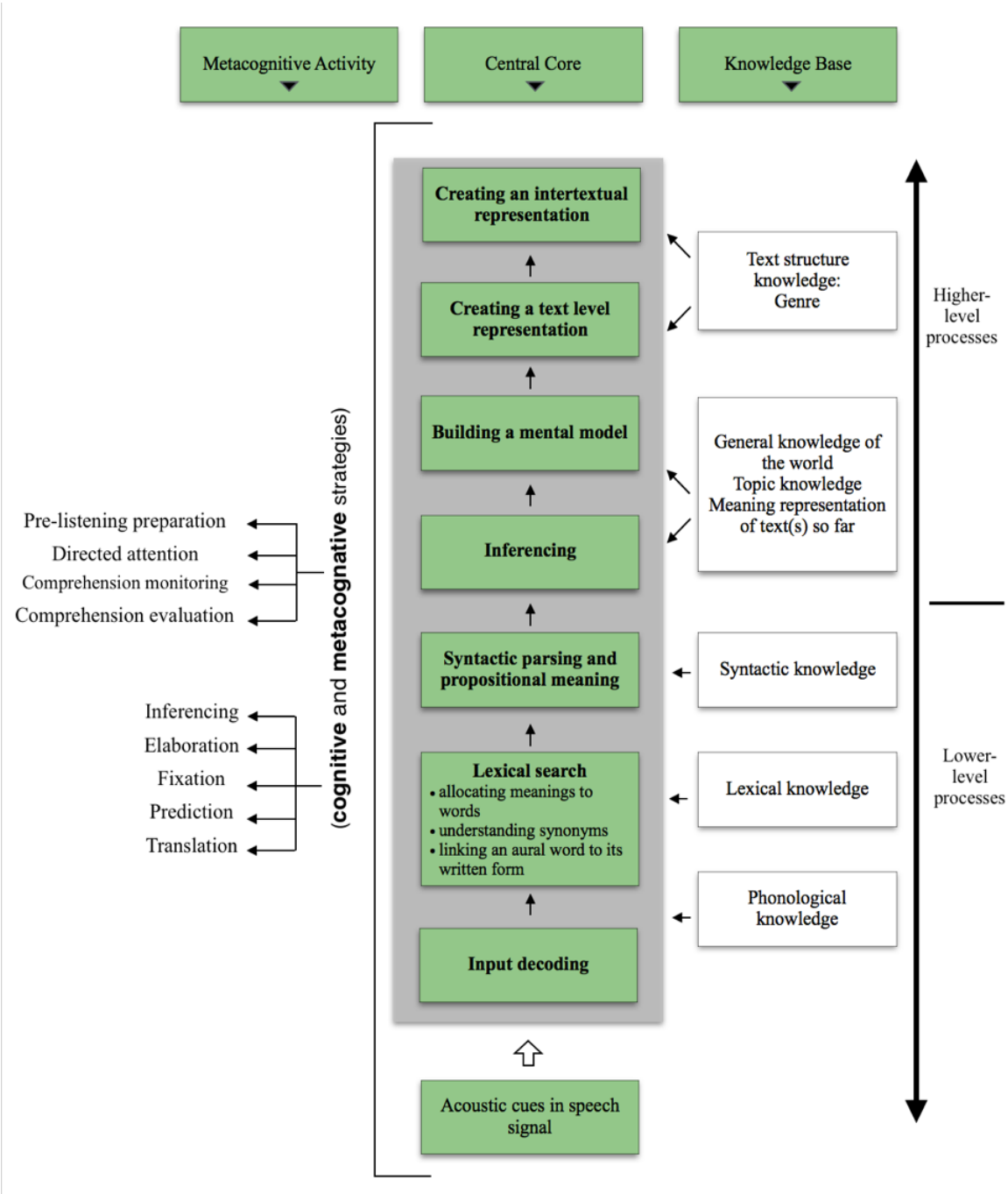


Figure 2-4: Lecture-listening processing model – adapted from Khalifa and Weir (2009, p.43), Field (2013), Brunfaut and McCray (2015, p.7) and Vandergrift and Goh (2012)

2.3.4 Previous research on factors affecting the success of lecture listening comprehension in relation to listening processes

Generally, as indicated earlier, lectures place considerable cognitive and linguistic burdens on students, particularly L2 language users (e.g. Lee, 2009). Listening is a covert process in which the listener must make an effort to understand information, and little time is provided during lectures to reflect on or process information or to ask for information to be repeated (Jeon, 2007). Because of the nature of listening to lectures, a body of research studies has focused on investigating an array of factors that are thought to affect the difficulty of listening to academic lectures in L2 contexts. Thus, this section reviews previous relevant research with respect to the numerous sub-processes involved in comprehending lectures.

a) Input decoding

The comprehension of fluent spoken input is contingent on the listener's ability to recognise words in a connected speech stream. Lectures are uniquely related to the ability to process oral texts, wherein authentic texts include variations in speed, accents and pauses, as well as assimilation, elision and insertion (i.e. sandhi variation) (e.g. Bejar et al., 2000). Speech rate (SR), or speed of delivery, is intuitively considered by many around the world to be a major factor contributing to L2 listening comprehension difficulty, wherein a fast SR may be difficult to understand as a result of a 'lack of processing automaticity' on the L2 listener's part (Buck, 2001, p.38). Logically, an excessively fast SR might impede L2 comprehension; even L1 comprehension is likely to be affected when listening to texts with an SR above 300 word per minute (wpm) (Vandergrift & Goh, 2012). Yet, the optimal SR for L2 settings and the precise impact of SR on listening comprehension, both positive and negative, remain unclear (Crawford-Camiciottoli, 2007). Some research on SR supports the hypothesis that the faster the SR, the less the L2 comprehension (Griffiths, 1992; Zhao, 1997; Brindley & Slatyer, 2002). Other studies, however, have shown that a slower SR does not necessarily benefit L2 listening (Blau, 1990; Derwing & Munro, 2001; King & East, 2011; Brunfaut & Révész, 2015; Jensen & Vinther, 2003). For example, in Brindley and Slatyer's (2002) study, ESL participants in a national competence-based listening assessment were generally disadvantaged when listening to a passage with a fast mean rate (210 wpm) in comparison to a normal delivery speed (180 wpm). When Derwing and Munro (2001) explored the SR

preferences of non-native listeners (advanced) for speech produced by native and non-native speakers, listeners preferred natural 'unmodified rates' (4.8 syllables per second [syll/sec]) or 'slightly speeded production' (3.8 syll/sec) over a manipulated slower rate (3.4 syll/sec) (p.333). Although previous studies investigated the effect of SRs on general L2 listening, this effect is expected to also apply to L2 lecture listening, as these studies generally attempted to use non-interactive monologues and conversations as inputs in listening assessment tasks.

Further, some research also reports that as accents become increasingly unfamiliar to the listener, comprehension decreases correspondingly, as found by Smith and Bisazza (1982), Harding (2011), Ockey and French (2014) and Ockey et al. (2016). The latter, for example, examined nine forms of an interactive lecture delivered by nine different native speakers of English, wherein each lecture was randomly assigned to a large group of L2 listeners from different parts of the world as part of TOEFL iBT and followed by comprehension questions. They found the lectures delivered by three speakers who were already judged by 100 participants from a TLU use domain in a university context to have a strong accent, i.e. different from the accent that listeners expected in the target situation and different from their local dialect, were more difficult to understand than other lectures delivered by speakers considered to have light accents, as might be expected in the target situation based on the Strength of Accent Scale devised for their research. Similarly, Harding (2011) also found that Mandarin Chinese L1 listeners performed better in answering several items on an English academic listening test when they listened to a Mandarin Chinese-accented speaker, while Japanese listeners who listened to a Japanese-accented speaker only performed better on some items of the test. Despite these contradictory findings on the shared-L1 effect, the results of Harding (2011) suggest that listeners might indeed perform (i.e. comprehend better) on tests in which the speaker shares the listener's L1 background in certain circumstances.

Another phonological aspect of input decoding involves decoding words and phonemes in a message, which might sometimes be difficult due to phonemic assimilation, a reduction in speed or other issues. For example, Goh (2000) found that Chinese tertiary-level undergraduate ESL students reported difficulty recognising phonemes and words in speech streams in their experiences of listening in or even outside a university context, which was indeed a major obstacle to listening for them. Goh (2000) reported 10 problems, five of which related to difficulty in recognising

phonological aspects, including not recognising words a listener knows, ignoring the next part while thinking about meaning, difficulty in connecting streams of speech, missing the beginning of texts and concentrating too hard on one part or not concentrating at all. Field (2004b) also reports that high-elementary and lower-intermediate learners of English might have difficulty in recognising words in connected speech; for example, when participants listened to a sentence and had to transcribe the last word, which was 'boys', many misheard the word and substituted it with the word 'voice', as these two words share the onset. Participants ignored the offset by substituting /s/ for /z/, even when the word did not fit semantically. Field (2004b) concluded that this occurs because the onset of a word rather than the coda is more important for non-native listeners; assimilation is regressive in English because the endings of words frequently change, making them a less reliable indicator during listening. Although Field's study was conducted with students from different language backgrounds in an English learning centre, the results might also be applicable to lecture listening in an ESL/EFL context, perhaps because of the similarities in English language level. Furthermore, in one of the few studies on the effect of sentence stress on L2 listening, Joyce (2011) observed that L2 sentence stress awareness was a weak predictor of listening comprehension compared to other variables, such as knowledge of syntax and phonological modification (i.e. reduced forms) among Japanese university students learning academic English. Even so, stress is an important feature of prosody that can be used to draw the listener's attention to particular information in an utterance and can be important during listening (Arnold, 2013).

b) Lexical search

From a lexical perspective, several studies claim that vocabulary is a strong predictor, if not the best, of listening success (e.g. Andringa, Olsthoorn, van Beuningen, Schoonen, & Hulstijn, 2012; Bonk, 2000; Kelly, 1991; Mecartty, 2000; Vandergrift & Baker, 2015). Texts generally vary in their lexical features, i.e. in terms of frequency of vocabulary, vocabulary types, use of technical terms, lexical density, multiword expressions, metaphors and modifiers such as hedges and emphatics (Bejar et al., 2000).

Brunfaut and Révész (2015), for example, based on PTE academic listening items, observed that four lexical complexity characteristics (lexical sophistication, lexical

diversity, lexical density, concreteness of content words) significantly correlated with listening task difficulty. For example, greater listening task difficulty was linked to passages containing higher lexical density and more content words than function words, meaning more information must be processed. In addition, passages with many varied lexis cause more difficulty, as listeners must decode and process many distinct words (Brunfaut & Révész, 2015). Further, numerous studies focus on the effect of the frequency of words during listening comprehension. Nissan, DeVincenzi, and Tang (1996), for example, observed that the presence of infrequent words in academic listening test items (TOEFL) contributed to significantly higher ratings of difficulty, wherein the frequency of words was assessed according to a list of 100,000 common words based on conversations between US adults, including some between college students.

Some recent research demonstrates that lectures also offer language-learning opportunities, as many lecturers do not assume that their NNS students have full understanding of a discipline's language (Basturkmen & Shackleford, 2015). In particular, Basturkmen and Shackleford (2015) found 164 language-related episodes, or transitory shifts, in which language was incidentally referred to, in eight hours of lectures recorded during a single first-year accounting course in New Zealand. Most shifts highlighted vocabulary meanings (technical and general register). Lecturers linguistically reformulated students' contributions according to typical conventions but rarely corrected grammatical mistakes or the connectivity of ideas. Other studies, such as Gablasova (2015), have found technical terms to be challenging for non-native speakers of English while listening.

Vocabulary is indeed an important aspect of the lexical search process, and it can be described in terms of lexical bundles/multiword expressions. Biber, Conrad and Cortes (2004) analysed a corpus of university classroom teaching and, surprisingly, frequently found lexical bundles related to stance, e.g. 'I want to …', discourse organisation, e.g. 'what I want to do …' and referential expressions, e.g. 'one of the things…'. With respect to L2 listening comprehension, Brunfaut and Révész (2015) found that such multiword expressions facilitate L2 academic listening significantly.

Furthermore, metaphor comprehension is considered to have a meta-discursive function, as many lectures contain metaphors (Littlemore, Trautman-Chen & Branden, 2011). On this point, Littlemore (2001) and Littlemore et al. (2011) show that international university students might have difficulty in understanding

metaphorical language, such as when a lecturer says ‘tomorrow we’ll wrap that up’, and often misunderstand its meaning while believing that it was correctly understood; therefore, students do not seek clarification.

c) Syntactic parsing and establishing a propositional meaning

Grammatical knowledge is also considered to be important while L2 listening and theorised to contribute towards comprehension success (Crawford-Camiciottoli, 2001; Vandergrift & Goh, 2012). Studies such as Mecatty (2000) investigated the relationship between syntactic/grammatical knowledge and L2 academic listening by examining the scores of Spanish learners with respect to their comprehension of main and supporting ideas in two expository academic texts, wherein performance on two tasks was assessed; however, multiple regression analyses showed no correlation between listening and grammar knowledge. Meanwhile, Joyce (2011) examined the scores of Japanese learners of academic English on a composite KEPT-TOEFL test and on a commercially produced grammar aural test (LCT) and found that syntactic knowledge made the greatest independent contribution to listening comprehension ($r=0.81$), confirming that syntactic knowledge is closely related to successful L2 aural processing.

Furthermore, Goh (2000) shows that some of her undergraduate participants had parsing problems, such as the inability to form a mental representation corresponding to a string of words or quickly forgetting statements that just heard. For example, one of her participants expressed, ‘I could catch most words. But I could not put all words into a full sentence to get a full idea’ (p.64). Field (2011) also attempted to determine what portion of monologic lecture-style inputs had been successfully decoded by a group of CEFR B2-level listeners attending a pre-sessional course at a university. Based on speech transcripts, listeners were found to be ‘less capable’ than one might expect in their ability to decode connected English speech (p.104). Listeners failed to match sounds to words, especially function words (e.g. ‘we’ve’ and ‘higher’), yet they managed to recognise certain types of words such as content words, multisyllabic words and familiar chunks. Field (2006) indicates that L2 listeners can achieve a great deal of accuracy in their decoding ability but not for entire input until reaching the CEFR C1 level. Their decoding ability, particularly of syntactic items, will begin to resemble the accuracy of native listeners only when L2 listeners reach a CEFR C2 proficiency level.

Flowerdew and Miller (2005) and Vandergrift and Goh (2012), however, believe that syntactic knowledge is not always essential since, for example, successful listeners allocate more attention to semantic cues, which carry more meaning than grammatical cues, as the latter might contribute less to the meaning of a passage. If a listener pays great attention to function words, this might ultimately interfere with listening (Vandergrift & Goh, 2012). Even so, researchers such as Kostin (2004) and Révész and Brunfaut (2013) hypothesise that syntactic complexity might indeed affect L2 listening because the more complex the grammar, the more difficult it is to process. This might also be expected for L2 lecture listening in real TLU situations.

d) Inferencing

For successful listening, it is widely acknowledged that during lectures, the listener must go beyond the literal, explicit meaning of an utterance to make sense of a speaker's intention, often using culture-specific knowledge to make inferences (Vandergrift & Goh, 2009). Khalifa and Weir (2009) state that there are different types of inferencing; these can include pragmatic inference, which may require world knowledge, or text-based inference (inferences between parts of a text), which requires topic knowledge and the ability to form a representation of the meaning of a text so as to infer implicit meaning.

While few studies have investigated the effect of inferencing on L2 academic listening difficulty, their findings were as anticipated. The following studies explored inferencing processes based on TOEFL dialogue test items, but this might also be related to L2 lecture listening. Kostin (2004), Nissan et al. (1996) and Ying-hui (2006) reported that texts requiring higher levels of inferencing were linked to greater academic listening difficulty. Taguchi (2005), for example, measured the accuracy and speed of comprehension of English implicatures, as two different dimensions of comprehending (pragmatic) implied meaning encoded in spoken dialogues, among Japanese college students learning academic English. Taguchi (2005) found that less conventional implicatures (indirect opinions) require more analytical processing, take longer to interpret and are more difficult to interpret than more conventional ones (indirect requests and refusals). Taguchi (2005) also observed a strong L2 language proficiency effect in the accuracy of understanding both types of implicatures, but not in the speed of comprehension. During L2 listening in general and all pragmatic encounters, Rost (2014) states that a listener must coordinate on several levels to

interpret pragmatic encounters, some of which are 'mental sets' that involve thinking about a situation in a specific way or asking about the meaning of a comment or offer; 'schemata' that require activating past experiences in order to collaborate in a transaction; thinking about sociocultural norms such as paralinguistic signals, pauses, silences and body language; and pragmatism in noticing aspects that are communicated but left unsaid (pp.138–139).

Furthermore, as part of the inferencing process, prior (background) knowledge is involved, including one's conceptual knowledge and life or real-world experiences, which also play an important role in listening (Vandergrift & Goh, 2012). In other words, such knowledge forms part of the ability to make 'elaborative inferences' that require the activation of prior, cultural or conversational knowledge, which correspondingly augment the mental representation of described events (Imhof, 2010; Zwaan & Rapp, 2006).

Quite a number of studies have examined the relationship between prior knowledge and L2 listening comprehension. Chiang and Dunkel (1992), for instance, found that both low-intermediate and high-intermediate listeners (undergraduates Chinese) achieved significantly higher scores on a post-lecture comprehension test when they listened to a familiar topic/lecture, 'Confucius and Confucianism', in comparison to those who listened to an unfamiliar lecture, 'The Amish People'. However, when the test type was considered, subjects' performance on passage-dependent items did not significantly differ with respect to the topic in the lecture (familiar or unfamiliar). Additionally, Markham and Latham (1987) examined the influence of religion-specific background knowledge on EFL university-level students from different countries. Based on a recall task of major ideas in a text, the students generally performed better when they listened to audio-taped texts matching their religious rites. Religion-neutral students had lower comprehension than the two other groups of students. However, those religion-neutral participants performed better on a text about Islam than one about Christianity; the researchers point out that this might be due to passage complexity (i.e. the Islam passage was easier than the one on Christianity in terms of syntactic complexity, which helped the students recall more information). The passages in their experiment were not real lectures, but this effect of topic familiarity is expected to also apply to L2 lecture listening.

e) Building a mental model and creating a text-level representation

Many listening researchers, such as Brown and Yule (1983, p.17), suggest that listeners also need to process lectures in a sequentially structured manner to create a 'coherent mental representation', rather than recording information in a linear manner (Field, 2011). In text comprehension/processing, the concept of genre is important because it gives the reader/listener certain expectations for the way that particular information will be organised (Carroll, 2008). According to Zwaan and Rapp (2006), text genre can lead the readers (or listener) to process texts in distinct ways; expository texts, for example, can encourage the reader to focus on either the connections between general concepts or on separate facts. Knowledge of expectations related to text genre can 'guide the cognitive activities that underlie comprehension processes as well as the ways in which [listeners] present discourse information in memory' (Zwaan & Rapp, 2006, p.729).

Many studies have examined the nature of lecture discourse and the organisation of lectures, as well as how these can help the listener to create a mental map of an oral text (e.g. Young, 1994; Dudley-Evans, 1994; Flowerdew & Tauraoza, 1995; Thompson, 1994, 2003). Thompson (2003), for example, analysed six real undergraduate humanities and science lectures to investigate two types of markers that may help the listener create a coherent representation in their mind while listening to a lecture. Thompson (2003) found that lectures typically contain 'content-related markers' that give information about content, such as 'next …', 'structuring markers' that refer to the order of major topics and sub-topics in a lecture, such as 'Firstly, …' and 'metastatements' that provide some interpersonal elements to direct the listener to content by saying, for example, 'right, so with that, let me start…'. Thompson (2003) also observed that a lecture is generally broken down into smaller informational chunks using 'phonological paragraphs', wherein each paragraph ranges between 345 and 1,000 words in length. Thompson (1994) argues, using Swales's (1990) rhetorical move analysis to examine lecture discourse, that lecturers generally seem to be 'aware … of the need to set up a framework for the lecture discourse and provide a context for the new information to come' (p.182). Also, as Lee (2009) mentions, lecturers may plan and use notes while delivering a lecture, yet the online nature of a lecture genre allows for a greater degree of flexibility. For example, Strodt-Lopez (1991) found that American professors use asides (episodes of discourse with a different topic framework) to explain a point at a local level to

develop the overall topic/lecture. Using asides in a lecture also requires the listener to create and connect additional text-based frames based on the surrounding discourse with frames from the everyday world (Strodt-Lopez, 1991).

Further, different aspects of lectures, such as their organisation and the use of discourse markers and other linguistic elements, might influence the formality and interactivity of the discourse. Many studies in L2 lecture listening research have recognised that knowledge of discourse signalling during listening is required, although their results are variable. For example, a pioneering study by Chaudron and Richards (1986) found that discourse (micro- and macro-) markers did not benefit listeners' retention of lectures as measured by recall cloze, multiple choice and true-false tests when scripts of the same lecture were presented with and without these markers. Dunkel and Davis (1994) also observed no positive effect of discourse markers on the number of notes and on the quality of information recalled from a lecture. On the other hand, other studies, such as those by Eslami & Eslami-Rasekh (2007) and Jung (2003), reported that discourse signalling assists L2 listeners in understanding and recalling lectures. Jung (2003), for example, reported that Korean learners of English who listened to a lecture with discourse signalling cues accurately recalled both high-level information (main ideas) and low-level information (supporting ideas or those exemplifying main ideas), in comparison to a group that listened to lectures without signalling cues. Buck (2001) mentions that despite mixed results in this area, the use of explicit discourse signals by lecturers and their exploitation by listeners are very important in successful L2 listening.

f) Creating an intertextual representation

Finally, the meaning of a single text (a lecture in this case) often needs to be integrated with the meaning derived from multiple mediums using the mechanisms of deletion, generation and selection of information to create 'integrated representations of multiple texts' (Khalifa & Weir, 2009, p.53). With respect to lectures in a real-world situation, Flowerdew and Miller (2005) identify activities that might require gathering content that appears across or in conjunction with other modalities, which is labelled as 'cross-modal processing in listening' by Imhof (2010, p.103). This can occur before, during or after a lecture when recalling preparatory readings, taking notes, reading a handout or looking at slides (Flowerdew & Miller, 2005). Other examples of this activity occur post-lecture, during the completion of a written

assignment, participation in a tutorial or sitting an exam. In L2 listening research, which may be similar to L2 lecture listening, involving the use of many visual inputs, several studies (e.g. Thompson, 1995; Ginther, 2000; Parry & Meredith, 1984) suggest in many cases, the addition of visuals reduces difficulty in listening comprehension (Bejar et al., 2000). This is because visuals can provide both contextual and non-linguistic inputs to activate top-down processing (Vandergrift, 2007). Using think-aloud protocols with tertiary-level Japanese students in an L2 context, Gruba (2004) concluded that listening to video texts with visual inputs, such as headlines, facial expressions, illustrations, written keywords and phrases, led to different responses in listeners to these two mediums. Some participants favoured written input, while others favoured visual prompts rather than listening to words; other participants who were quite proficient in listening tried to seek clues in the auditory input that would help interpret the written input. Meanwhile, others might concentrate on the aural input, ignoring the written input, which might be perceived as distracting or of little help. Nevertheless, Gruba (2004) concludes that visual elements should be considered as 'integral resources to comprehension' and must be processed simultaneously, i.e. along with aural input, in order to be effective rather than just 'supporting verbal elements' (p.51).

In addition, much advice exists on what to do before, during and after a lecture. For example, in lectures, note-taking is a common skill that is intuitively believed to promote lecture learning amongst both students and lecturers (Carrell, Dunkel & Mollaun, 2002). Salimbene (1985) states that reading an overview of lecture before listening to it can 'develop expectations about the contents and organization of the lecture', thereby clarifying the main sections and sub-sections of it and making the material easier to jot down (p.91). Wright and Wallwork (1962) advise that notes should include the basic structure of a lecture in addition to essential facts, ideas and consecutive steps (p.49). Based on reading and listening taxonomies of sub-skills, Al-Musalli (2015) proposes several specific note-taking skills: 'outlining skills', which involve deciding on the layout for recording information in a logical order and a readable manner; 'writing skills', or the ability to write quickly in contracted form using abbreviations and symbols, only noting important information, e.g. examples, comparisons etc., and to maintain the relationships between main ideas and supporting details; and 'reviewing skills', which include rewriting notes, adding more information gathered from notes while writing or from others' notes, books or further

discussions (p.143).

In fact, lecture note-taking is a complex, cognitively demanding skill that requires the use of both lower and higher cognitive listening processes under time pressure to comprehend incoming information (Bloomfield et al., 2010). The listener needs to select what to retain before information is forgotten and to capture that message in written form while continuing to listen to the lecture for a long period of time (Peverly et al., 2013; Piolat, Oliver & Kellogg, 2005). This simultaneity of mental work in note-taking might place high demands on the central executive of the working memory system (Bloomfield et al., 2010). Although many studies have been unable to show the facilitative effect of note-taking, such as Hale & Courtney (1994) with respect to ESL listeners' note-taking and subsequent comprehension of information delivered in a 22-minute mini-lecture, researchers such as Bloomfield et al. (2010) have stated that note-taking is a beneficial metacognitive strategy (Bloomfield et al., 2010) and is often needed in academic settings where students do not necessarily need to retain all transmitted information in their memory (e.g. Piolat et al., 2005). A study by Carrell et al. (2002) examined the effects of note-taking on L2 participants listening to lengthy lectures. Participants were allowed to take notes while listening to one of two lectures (either one long or one short), but not while listening to the other lecture (either long or short). The results showed that participants performed significantly well on test items when permitted to take notes on short lectures (~2.5 minutes) but less well when note-taking was not allowed. Notably, participants performed less well with long lectures (~5 minutes), regardless of note-taking. These findings demonstrate that note-taking can be a useful aid to increase performance on academic listening comprehension tests but may be less helpful when listening to longer passages or even those involving more familiar topics; nevertheless, note-taking is not likely to be detrimental to performance in either case.

Furthermore, with respect to both input decoding and creating intertextual representation processes, lectures often involve a large number of speakers, including the lecturer and students. Therefore, the listener must collect content from different inputs. Morell (2004), for example, in her comparison of lectures taken from the English Studies Department at a university in Spain, found that interactive lectures tend to be characterised by more student interventions (often as answers to lecturers' questions), a higher number of personal pronouns (you, we), elicitation markers (e.g. What do you think about …?), more display questions that tests students' knowledge

about the material to hand (e.g. which *type* questions), referential questions that enquire about unknown information (For what reasons do you think …?) and, finally, negotiation of meaning by using comprehension checks and clarification requests. Non-interactive lectures involve very little, if any, student participation, and they lack direct references to students or connections between content and students' world experiences, personal pronouns and discourse markers. Some research (e.g. Fox Tree, 1999) has found that interactive lectures seem to be easier to understand than monologic discourse. Ockey et al. (2016) assume that this may be due to the repetition and redundancies that occur when people converse in interactive lectures, which may facilitate comprehension. But according to Field (2008a), the more speakers that are involved in an academic listening encounter, the more difficult a listening task becomes, as the listener additionally needs to form ideas about the voice characteristics of each speaker in terms of speech rate, pitch, setting and loudness. Shohamy and Inbar (1991), who used three versions of an English listening test with Israeli high school students, found that oral texts, including a 'consultative dialogue' and a 'lecturette' with discoursal and pragmatic features such as constant interaction between the main speaker and addressee, repetitions and redundancies and lower grammatical complexity, were easier to understand than a 'news broadcast', which was scripted as a pre-written, edited monologue with no oral features of pauses and redundancies; however, this result also might be due to the difficulty of the content of the latter compared to the former. In contrast, Read (2002) notes that listening to an academic discussion between three speakers was significantly harder than listening to a scripted monologue text given by one speaker to English learners from different backgrounds. Thus, it appears to be unclear whether the number of speakers in a listening encounter, such as a lecture, is detrimental to or useful for comprehension.

It can be concluded that many studies examined the effects of various aspects of L2 listening (e.g. lecture structure, speakers' accents, discourse signaling cues, syntactic simplification and content knowledge) (whether related to listening comprehension in general or lectures and discussions in a university context), rarely associating these aspects with listening process-models. Nevertheless, the specific mental abilities as a set of listening processes (sub-processes and sub-skills) that listeners must employ during lecture listening in a real TLU setting remain only partially understood, but they could be important to understanding what lecture listening involves to prepare learners efficiently for real-world lecture experiences. In

order to specify what lecture listening abilities are employed in a TLU situation, an NA is conducted in this study to investigate L2 lecture-listening processing in a real-world context, which has been rarely discussed in previous research.

2.4 Conclusion

This chapter has reviewed NA and listening comprehension literature and proposed a model for this study. Based on this, some major problems were identified. Despite the relatively long history of NA, and even though it is typically regarded as a key process in course designs on which the results of other course-design stages might rely, little attention has been paid to the methodology of performing NAs in the real world. Further, most previous NA EAP listening research, e.g. data gathered about listening from various disciplines in a single study, produced conflicting results, did not use various methods and sources, was not informed by theoretical frameworks and looked into the listening abilities needed in a TLU situation at a more general level or as they related to speaking. Hence, a deeper understanding is still needed of what specific mental abilities listeners rely on during L2 lecture-listening in a real-world situation. Lack of such information might have a negative impact on EAP listening training because instructors, as Field (2011) argues, may use conventional comprehension exercises where performing well in them might not ensure that a listener will perform competently in a TLU. Further, it has been noted that certain terms (process, sub-skill, strategy) are, typically, used interchangeably in the literature. Thus, this study aims to shed some light on what occurs in the lecture-listener's mind in terms of automatic processes and their constituent 'sub-skills' and strategies by drawing on theoretical models of text comprehension. At the same time, it also seeks to establish a methodological NA model that can be used to inform EAP listening-course design using sequencing and triangulating.

The following chapter (3) translates the research gaps described in this chapter (2) into research questions and presents the study's overall design.

Chapter 3 Overall design

3.1 Introduction

The purpose of this study is to uncover the cognitive processes that listeners might need to perform when comprehending lectures; this area has been little researched in L2 listening. And since it is an EAP listening NA study, these processes are expressed as target needs (what listening abilities a listener has to have to function effectively in a TLU situation), present needs (what listening abilities a listener does not have currently) and language-learning wants (what listening abilities a listener wants to learn). Furthermore, this study aims to present an example of an NA methodology using both sequencing and triangulation to guide the practice of conducting NAs for learners with domain-specific L2 needs.

These two research aims are translated into the research questions presented in 3.2. Section 3.3 describes the overall mixed-methods design utilised in this study, and the rationale behind the choice of methodology is also presented. The study's educational context is described in 3.4. A summary is provided in 3.5. The reader should bear in mind that this chapter describes the study's overall design, whereas each data collection method and the analyses used in this study are fully elaborated in each phase's respective chapter.

3.2 Research questions

This study aims to address the aforementioned aims by answering the following questions:

1. What are the academic listening needs of L2 students listening to lectures in the English Language and Literature undergraduate programme (ELL) at KSU?
    a. What target linguistic needs do ELL undergraduates require, as identified in lecture transcripts from the ELL programme?

b. What listening processes and processing sub-skills do ELL undergraduates need to engage in when listening to lectures in the ELL programme?

c. What real-time processing problems do ELL undergraduates experience when listening to lectures in the ELL programme?

d. What do lecturers perceive to be the target, present and language-learning academic cognitive listening needs of ELL undergraduates?

e. What do ELL undergraduates themselves perceive to be their target, present and language-learning academic cognitive listening needs?

3.3 Overall design

In order to answer the above research questions, the current study utilises a mixed-methods design that gathers, integrates and interprets both qualitative and quantitative data to understand the research problem (Creswell, 2015). Historically, mixed-methods research has been regarded as 'the third methodological movement' (Tashakkori & Teddlie, 2003, p.5). Thanks to the 'compatibility thesis',[12] it is now more widely accepted that quantitative and qualitative paradigms can be combined in a single study (Tashakkori & Teddlie, 1998).

Prior to the year 2000, most ESL NAs were conducted using either semi-structured interviews or questionnaires, as Long (2005b) and Serafini et al. (2015) mention. Also, despite Brown (2016) indicating that NAs generally lend themselves more to using qualitative rather than quantitative methods, the importance of combining these two data types in NAs in the twenty-first century has gradually been recognised. NA methodology has become increasingly sophisticated, as Serafini et al. (2015) note, and researchers such as Brown (2016) argue that mixed-methods can add extra value by providing additional insights into NAs.

[12] This is the opposite of the 'incompatibility thesis' which assumes that quantitative and qualitative paradigms cannot and must not be mixed and instead advocates mono-method studies (Onwuegbuzie & Leech, 2005).

Indeed, as Creswell and Plano Clark (2011) argue, implementing a mixed-methods design combining quantitative and qualitative approaches can 'provide a more complete understanding of the research problem than either approach by itself' (p.8). Miles and Huberman (1994) also note that mixed-methods can create a 'powerful mix' (p.42). Moreover, synthesising the two approaches can eliminate/moderate their inherent limitations, as the weaknesses of one can be compensated by the strengths of the other (Brown, 2016; Creswell & Plano Clark, 2011; Dörnyei, 2007). Additionally, a mixed-methods approach enables the researcher to triangulate the data (Teddlie & Tashakkori, 2009; Brown, 2016). Long (2015) defines triangulation as involving the comparison of 'different sets and sources of data with one another' (p.136).

The benefits of a mixed-methods approach are directly applicable to this study. As Vandergrift (2015) argues, employing a mixed-methods design to study 'a construct as implicit as listening' (p.168) may be beneficial, as data from multiple methods can provide convergent data and paint a more complete picture of the listening comprehension construct. Indeed, several mixed-methods listening studies exist (e.g. Mareschal, 2007;[13] Vandergrift & Tafaghodtari, 2010). In this study, this approach enabled a more rounded understanding, allowing for an investigation from different perspectives of the cognitive processes listeners need to activate when comprehending lectures.

Creswell (2015) and Creswell and Plano Clark (2011) propose three basic designs for mixed-methods studies: convergent, explanatory sequential, and exploratory sequential. This study employs an 'exploratory sequential design'. This design begins by exploring a problem using qualitative methods, since the precise research questions might be unknown and the population might be understudied. After this initial exploration, the qualitative findings can be used to *build* a second quantitative strand to test or generalise the qualitative analyses (Creswell, 2015; Creswell & Plano Clark, 2011). Commencing with a qualitative rather than a quantitative approach has been particularly encouraged in NA by Long (2015), who argues that 'it is almost always better to begin with more open-ended procedures' (p.141) and that this can uncover issues that the outsider researcher does not know about the target domain.

[13] Mareschal (2007) gathered data from a close-ended questionnaire, stimulated-recall, think-aloud, observation, notebooks and an open-ended questionnaire to study how a metacognitive approach to listening instruction impacts on strategies, metacognitive knowledge and listening success.

This study therefore avoids starting with what Creswell and Plano Clark (2011) call 'an explanatory sequential design' – using quantitative methods first and then qualitative methods to explain quantitative findings, as Long (2015) warns that this would incur 'the risk of precluding discovery of relevant information' (p.141). For example, questionnaire items about a target situation might be based on the preconceptions of 'an ignorant outsider' (Long, 2015, p.141).

In this study, the exploratory sequential design was carried out in five phases involving a mixture of qualitative and quantitative methods and organised in two strands (see Figure 3-1). The first strand was largely qualitative (Phases 1–3) and the second primarily quantitative (Phase 5). Phase 4, which 'bridges' the qualitative strand and the quantitative one, was considered to be more relevant to the first strand than the second; even though it contains mostly quantitative data, it was included within the qualitative strand because it builds mostly on Phases 1–3. Phase four—the expert panel review process—is considered a methodological step in this study to integrate data from the first qualitative strand to the second strand of the study. This phase investigates how valid and reliable the findings from the first strand of the study's sequencing approach are, based on views from expert judges external to the TLU to justify proceeding to the second strand of the sequencing approach. It should be noted, however, that the qualitative strand also contains linguistic analyses involving certain quantitative measurements; further, the quantitative strand includes a single open-ended question in the questionnaire (generating qualitative data). As will be explained more extensively in the next chapters, qualitative data were analysed using the academic listening framework in 2.3.3, while quantitative data were analysed using SPSS for descriptive statistics and R for factor analyses. The linguistic analyses that were part of Phase 1 utilised corpus-based tools (e.g. WebVocabProfile). Data from the different phases were appropriately sequenced during the data-collection stage; each method built on the previous one, as will be explained in the following paragraphs.

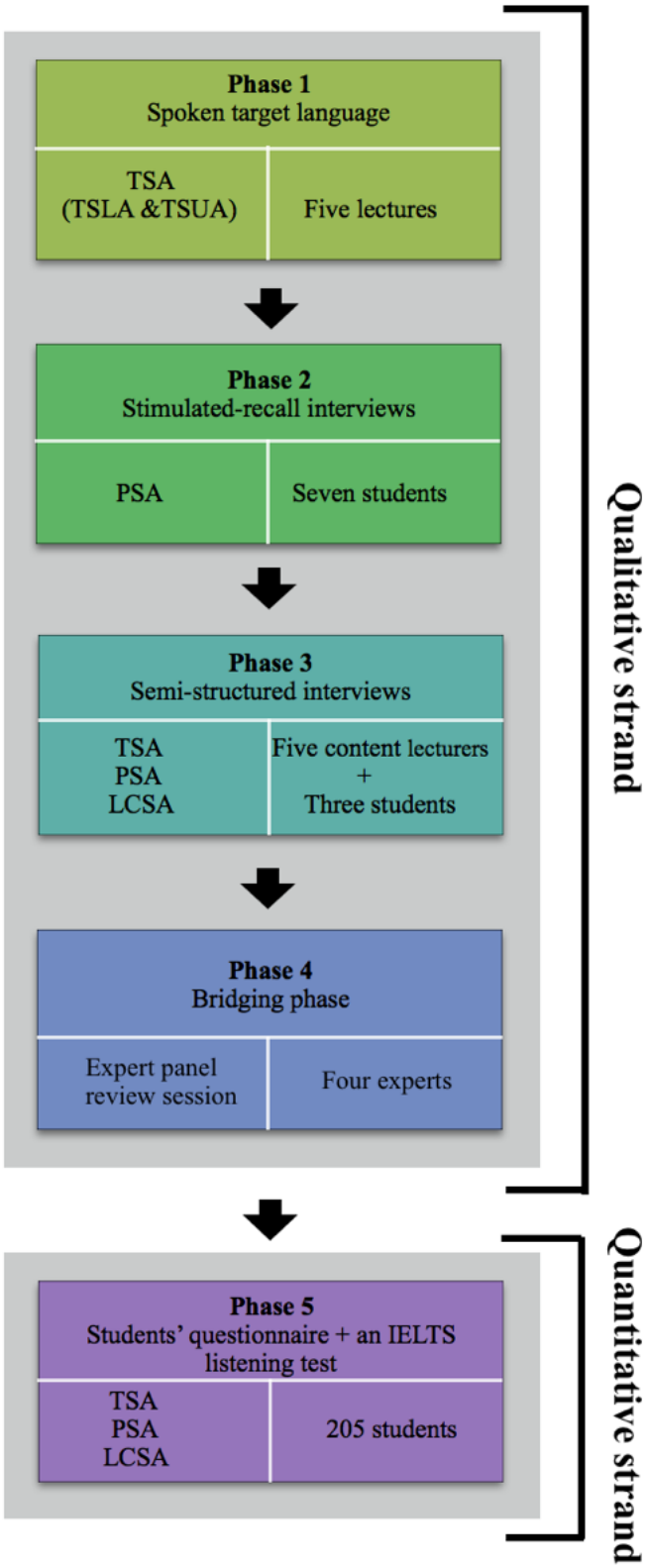


Figure 3-1: The study's exploratory sequential mixed-methods design
(TSA=target-situation analysis, PSA=present-situation analysis, LCSA=learning-centred situation analysis)

In the first strand of the study, Phase 1 commenced with collecting examples of spoken target language. Five audio-recordings were made of two linguistics and three literature lectures from the ELL Department to develop a small, specialised corpus entitled 'the linguistics-literature corpus'. This was done to inform *RQ1**a*** and *RQ1**b*** and gain insights into the target linguistic and cognitive processing needs of listening in the study's TLU situation (see Chapter 4).

During Phase 2, stimulated recalls were conducted with seven ELL students. These students were selected on the basis of their performances on an IELTS listening test that was administered to approximately 50 students from different years of study to help select participants with different levels of proficiency for recall. In this manner, the number was narrowed down to only seven participants (and three for Phase 3). Each participant listened to one lecture sourced from the corpus compiled in Phase 1 and matched to their year of study. Each participant listened to the sample lecture twice. First, it was listened to as a whole, followed by a summarisation activity. On a second listening, it was broken into segments to help listeners recall their cognitive processing when listening the first time. Based on recall prompts, the participants reflected on their listening problems as they tried to develop a mental representation of the lecture. This phase provided data about the participants' present needs, to answer *RQ1**c*** (see Chapter 5).

In Phase 3, semi-structured interviews were conducted with five content lecturers and three students, in which some data from Phases 1 and 2 informed the interview guide. Further, by gathering and exploring extra data, including from lecturers, this phase was able to expand on the cognitive listening needs relating to target, present and language-learning wants. The information obtained from this phase helped inform the answers to *RQ1**d*** and *RQ1**e*** (see Chapter 6).

Once the qualitative phases were completed, Phase 4 was implemented to evaluate randomly selected data (excerpts, quotes and codes) gathered from Phases 1-3, check sequenced findings before implementing the final phase, and verify any additional data (i.e. sub-processes) to be included in the final phase. This involved conducting an expert panel review with four judges external to the TLU with backgrounds in applied linguistics. They were provided three judgement tasks that included selected findings (coded data) listed in a 'Table of Specifications'. For each task, the Table presented

questions in a yes-no format to assess the validity and reliability of coding for sub-processing (quantitative). Judges were also asked to provide qualitative data (feedback) (see Chapter 7).

The second strand comprised Phase 5, which consisted of a student questionnaire that was primarily devised based on the outcomes of the preceding phases. The questionnaire was completed by 205 ELL students across all three years of study. It was accompanied by an IELTS academic listening test to measure the participants' academic listening proficiency. This final phase elicited data related to the study's three NA approaches and helped inform the answer to *RQ1e* (see Chapter 8).

This phased approach also allowed for triangulation; I compared the data from the lectures, the students' recalls and the interviews with lecturers and students against the data from the questionnaires. The sequencing approach was thus followed by a triangulation process (see Chapter 9), which may help cross-validate the results (Tashakkori & Teddlie, 2003).

3.4 Context of the study

As indicated earlier, the present study includes Years 1, 2 and 3 undergraduate students, as well as lecturers at the ELL department. All participants were female, since universities are not coeducational in the culturally complex context of Saudi Arabia.

The ELL programme comprises eight levels (four years). Freshmen students (levels one and two) take general English language learning courses, e.g. basic language skills (3hrs/w), listening and speaking (2hrs/w), reading (2hrs/w), vocabulary building (2hrs/w), remedial grammar (2hrs/w) and introduction to literary terms (2hrs/w). This year aims to improve students' English competence and prepare them for their discipline-specific courses in upcoming levels (3-8). The focus of these first two semesters is on general English, with some partial focus on EAP (specifically, academic writing). Only after that do students begin taking content courses (their degree 'proper'). In the case of Literature and Linguistics students, there are such courses as Applied Linguistics, American Literature, Shakespeare, Victorian Poetry, and Phonology. More than half of the modules focus on literature,

and the remainder on linguistics with some focus on translation. Because of this structure, and for reasons of clarity, I label degree-focused years of study as Year 1, Year 2, and Year 3, and I leave aside the freshmen's first year.

3.5 Summary

In this chapter, the present study's research questions, overall design, the rationale underlying the choice of methodology and the study's context have been introduced. Qualitative data came from three phases using three methods: spoken target language, stimulated-recall and semi-structured interviews. The aim of this qualitative strand was to explore academic listening so as to address the lack of research in this area, as well as to determine the questions to be asked in the quantitative strand. Follow-up quantitative data provided a more general picture of listening needs, as the questionnaire allowed collecting a large quantity of data in a relatively short time. An interim phase was also included to link the two strands.

The subsequent chapters present the methodology of each phase in more detail and report the findings of the analyses.

Chapter 4 Lecture analyses (Phase 1)

4.1 Introduction

The following four chapters report the findings of this mixed-methods research. This chapter commences with the first phase of the sequencing approach, i.e. an exploration of the linguistic features, cognitive processes and sub-skills underlying five lectures to identify target listening needs. Phase 2 findings on processes, sub-skills and strategies to establish present listening needs, as encountered by participants in stimulated recalls, are presented in Chapter 5. Phase 3, described in Chapter 6, reports lecturers' and students' perceptions collected through interviews on processes, sub-skills and strategies regarding target, present and language-learning listening needs. Phase 4, which aims to bridge the gap between Phases 1–3 and Phase 5, is described in Chapter 7. Phase 5 findings pertaining to all needs types, collected using questionnaires, are provided in Chapter 8.

This chapter describes the Phase 1 methodology (4.2) and findings from an analysis of spoken target language to answer *RQ1**a***: 'What target linguistic needs do ELL undergraduates require, as identified in lecture transcripts from the ELL programme?' and *RQ1**b***: 'What listening processes and processing sub-skills do ELL undergraduates need to engage in when listening to lectures in the ELL programme?' Two types of analyses were conducted: Part 1 concerns an analysis of six linguistic factors (4.3), while Part 2 involves an analysis of cognitive listening processing (4.4). Finally, a summary on Phase 1 is provided in 4.5.

4.2 Data-collection methodology

This section elaborates on how data were collected to generate a small, specialised corpus and how this corpus was analysed.

4.2.1 Collecting spoken target language

To gain initial insights into and explore listening to real-world lectures, this study began by collecting target language, which is one of a number of NA data-gathering methods (Brown, 2009, 2016; Dudley-Evans & St John, 1998; Long, 2005b, 2015;

Hutchinson & Waters, 1987). In this study, target language in the form of spoken data was collected to develop a lecture corpus capturing 'naturally occurring' spoken discourse (Conrad, 2005). This corpus, albeit limited in size, was compiled to gain some understanding of the linguistic and cognitive processing behaviours involved in linguistics and literature lectures in this particular TLU situation from the perspective of listening comprehension. The corpus thus contains a specialised variety of authentic language; it is derived from a particular field (ELL) occurring in a particular time period. However, this is not a corpus linguistics study. Rather, it presents a sample of a discourse community's language due to the lack of a ready-made corpus of such data in the study context and to gain some initial insights into lecture-listening. A 'do-it-yourself corpus' was therefore compiled following the guidelines by McEnery, Xiao and Tono (2006).

After obtaining approval from the KSU Head of Department, permission was sought from six lecturers to attend lectures and make audio-recordings of their talks (for cultural reasons, videoing was not allowed). All six agreed and signed a consent form (Appendix A). Eventually, one lecturer's recording was discarded due to the lecturer's frequent code-switching, whereas this study was intended to focus exclusively on L2 processing as opposed to L1 processing. When recording these lectures, I used two digital voice recorders (one placed on the podium, the other near the whiteboard) to ensure that the sound would be captured clearly as the lecturer moved around. The audio-recordings were of high quality; however, sometimes students' comments were scarcely discernible because they were too far from the recorders; when a student contribution was unintelligible, it was entered as [unclear] in the transcript. Further, although some researchers, such as Dörnyei (2007), indicate that the presence of a researcher, and/or, as Bloor and Wood (2006) mention, audio equipment in the classroom, can be detrimental, because it can intimidate/distract the participants (Bloor & Wood, 2006), I was present whilst recording. My aim was to note any visual information that would not be captured in the audio-recordings, e.g. words written on the board. My impression was that my presence did not alter the lecturers' linguistic behaviour. The following subsection describes the resulting corpus.

Linguistics-literature corpus

During this phase, a small, specialised corpus entitled the 'linguistics-literature corpus' (22,591 words) was generated (see Table 4-1). Although it is hard to 'fully represent the whole language' of a community (Rizzo, 2010, p.5) with a limited collection of passages, great care was taken to obtain lecture samples representing various subject areas to approximate the language used across the degree programme. Amongst the five lectures, as can be seen in Table 4-1, there was a mixture of interactive and non-interactive ones in terms of style; also, they were from five different courses (some more linguistics- and others literature-oriented), covered different levels of study, and were delivered by different NNSs. While the preferred size (exact number of words) for different types of corpora generally has not yet been specified, Leech (1991) believes 'size is not all-important' (p.10). In fact, McEnery et al. (2006) point out that the corpus size should be determined by the research questions being answered and the practical considerations involved in gathering authentic texts. In this regard, the five lectures made it possible to reveal an array of target listening cognitive and linguistic needs to answer *RQ1**a*** and *RQ1**b*** and devise the subsequent phases based on them. Gathering further lectures might actually provide very similar data, especially concerning cognitive processing. This study also involves other methods that may complement what the corpus reveals. Thus, the size of this corpus was felt appropriate.

Table 4-1: The linguistics-literature corpus

Lecture number	Course	Topic	Level (study year)	Word count	Minutes	Lecturer nationality
1	Teaching techniques	Task-based Approach	L6/Y2	5,683	45.72	Jordanian
2	Nineteenth-century literature	Middlemarch	L7/Y3	5,066	50.66	Egyptian
3	Poetry	Harlem	L3/Y1	5,056	41.00	Saudi
4	Sociolinguistics	Age and gender	L5/Y2	3,272	23.32	Saudi
5	British literature survey	The rise of the novel: Richardson & Fielding	L4/Y1	3,514	24.47	Saudi

4.2.2 Analysing spoken target language

Initially, lecture content was transcribed verbatim. Then, specific spoken features (accenting, repetition, disfluencies) were added to the transcripts. The transcripts

include punctuation, and speech is divided into sentences to 'create the feel of oral communication in writing', as Dörnyei (2007, p.247) suggests. An example transcript appears in Appendix B.

In this phase, spoken target language is broadly analysed in two ways. Part 1 uses a *corpus-based analysis,* which is mostly quantitative. This type of analysis, as an analytical method, finds patterns within language by determining typical and unusual linguistic choices using computer-assisted techniques (Conrad, 2005), it was used to provide information about six linguistic factors for this study that might affect EAP listening and which cannot be explored through qualitative discourse analysis. A corpus-based approach does not, however, allow one to make judgements about language use (Biber, Conrad & Reppen, 1998). Therefore, Part 2*,* an *analysis of spoken discourse*, was conducted. This is mainly qualitative, and can help to examine indirect data, such as complex cognitive processes, by making inferences and judgements about information heeded in texts (Tenbrink, 2015). Thus, Phase 1 uses a combination of computer-assisted techniques and manual inspection to analyse its data. (More details on analysis procedures are described in relevant sections, below.)

4.3 Corpus-based analysis (Part 1)

This section presents the corpus-based analysis findings related to six linguistic text factors: lexical density, lexical frequency, technical vocabulary, formulaic expressions, (which) non-restrictive relative-clauses (WNRRCs) and speech rate.

Interest in these linguistic characteristics comes from Brunfaut and Révész (2015) who used different linguistic complexity measures – lexical (sophistication, diversity, density, concreteness), phonological (frequency of contractions), syntactic (e.g. negations) and discourse (e.g. anaphor reference) – to investigate how these issues affect L2 academic listening difficulty using a *PTE Academic* task. In my study, however, I restrict the analysis to some sub-constructs related to lexical (lexical frequency, density, multi-word units, technical words), phonological (speech rate) and syntactic (WNRRCs) measures. In this analysis, lexical knowledge becomes a focus because previous research has generally found that such knowledge is strongly associated with L2 listening (e.g. Révész & Brunfaut, 2013; Brunfaut & Révész, 2015). The study excluded discourse measures, such as those integrated in the Coh-

Metrix programme (McNamara, Louwerse, Cai, & Graesser, 2005), to gauge discourse complexity and identify the cohesion indices of a text by analysing connectives and causal, intentional, temporal and spatial cohesion (e.g. Brunfaut & Révész, 2015; Révész & Brunfaut, 2013). This is because at the time of conducting the present study, Coh-Metrix was not equipped to analyse cohesion in very long texts; however, at present, there is a new analytical feature that deals with large corpora exceeding 15,000 words. Furthermore, Brunfaut and Révész (2015) Révész and Brunfaut (2013) were more interested in carrying out a quantitative analysis to study the effect of cohesion on listening difficulty in the case of spoken passages, by generating cohesion incidence scores. In contrast, my study concentrated more on conducting a qualitative analysis of the discourse in the lectures (which is the focus of part 2 of this chapter) to show how a listener needs to connect ideas to help them establish cohesion in their minds. More specifically, my study also aimed to explore aspects of discourse that help achieve cohesion, such as by identifying a topic, an aside, a main point and a specific proper noun in lectures, and by connecting pieces of information in the entire lecture—features that computational programmes will find difficult to identify. I also include technical vocabulary and WNRRCs based on a study by Crawford-Camiciottoli (2007), who analysed business lectures. However the absence of other elements does not mean they are unimportant. Rather, they are excluded due to the practical challenges of analysing more factors. Hopefully, the linguistic characteristics selected can paint an overall picture of the nature of these lectures as far as oral language is concerned. Finally, computer-assisted tools, such as WebVocabProfile, which has been used successfully for analysing EAP listening in e.g. Brunfaut and Révész (2015), are used to analyse these factors. Brown (2016) has also recently affirmed that such analytical tools might prove beneficial for NAs conducted for English language teaching purposes.

Broadly, the linguistics-literature corpus seems to be lexically dense. The analyses also show that the lectures contain a large number of high-frequency words and, albeit in small numbers, mid- and low- frequency words. There are also 239 technical words, but most of these are literature-oriented terms. Further, the corpus contains 68 formulaic expressions, often related to discourse organisation. Speakers' speech rates are generally either average or moderately slow. Literature-oriented lectures seem to contain WNRRCs as a complex syntactic structure more often than linguistics-

oriented ones. Of note, due to current methodological limitations with automated analyses, several of these analyses are based on individual words as opposed to the phraseological nature of the language.

Below, the six linguistic characteristics are described individually, along with some relevant previous studies, methods and analysis procedures, as well as the analyses themselves.

4.3.1 Lexical density

According to Révész and Brunfaut (2013), lexical density (LD) is often operationalised as the proportion of content words (e.g. main verbs) to the total word count in a text. Accordingly, LD is generally considered to indicate information density in a text (Révész & Brunfaut, 2013; Bloomfield, Wayland, Blodgett, & Linck, 2010; Bloomfield et al., 2011), i.e. a text containing a larger number of content words (primarily carrying information) is likely to be more dense than texts containing a relatively large number of function words (e.g. prepositions) (Faerch, Haastrup & Phillipson, 1984; Révész & Brunfaut, 2013). Consequently, researchers such as Bloomfield et al. (2011) believe that greater LD exerts a higher processing load on WM and might also reduce WM's capacity to simultaneously process other information in the aural input (e.g. noticing a literary character's name).

Buck and Tatsuoka (1998), Révész and Brunfaut (2013) and Rupp, Garcia and Jamieson (2001) provide empirical support for this hypothesis. For example, Révész and Brunfaut (2013) observe that passages including a larger proportion of K1 function words (e.g. 'and', 'with') appear to be significantly less cognitively demanding than passages with smaller proportions of K1 function words. Meanwhile, passages with higher LD[14] prove significantly more demanding for L2 listeners. Furthermore, other research has looked specifically at the LD of real academic genres, including lectures, such as Ure (1971), Crawford-Camiciottoli (2007) and Nesi (2001). Ure (1971), who seems to be one of the first to introduce the LD concept, found that LD is generally under 40 percent for most spoken genres and above this for written ones, thus 40 percent is typically considered to denote the boundary between

[14] Overall mean of content words per total number of words ranged from .45 to .58.

low (orality) and high (literacy) LD levels. The following paragraphs describe the method used to analyse LD, as well as the analysis results for this study.

Here, I use WebVocabProfile (Cobb, n.d.), which calculates the ratio of content words to the total number of words in a passage, to measure LD of the linguistics-literature corpus. Before uploading files into WebVocabProfile, the lectures were edited slightly. Despite the statement by Bloomfield et al. (2010) that editing transcripts by excluding irregularities such as filled-pauses (e.g. 'err' or 'uh') and false starts[15] might also exclude information which could be regarded as lexical by some listeners, no existing software appears to take into account such characteristics. Thus, I follow Nesi (2001) and Crawford-Camiciottoli (2007), who also eliminated irregularities from lecture transcripts, in order to compare LD in this study with their results, and because these non-lexical items can impact on analysing LD.[16] I also removed about ten Arabic words from the *Sociolinguistics* and fewer from the *Teaching Techniques* transcripts. Further, the transcripts include both lecturer and student input, because listening and comprehending other students' speech is part of EAP listening. Finally, two lectures (*Nineteenth-century Literature* and *Poetry*) contained some read-aloud written texts. Written input[17] was not removed because the aim was to include all words uttered in these lectures. (Appendix C, original output from WebVocabProfile for each lecture.)

Table 4-2: Lexical density

	Teaching Techniques	**Nineteenth -century Literature**	**Poetry**	**Sociolinguistics**	**British Literature**
Words in text (tokens)	5,911[18]	4,986	5,189	3,334	3,297
Content words	1,748 (29.57%)	1,483 (29.74%)	1,306 (25.17%)	1,098 (32.93%)	1,012 (30.69%)
Function words	3,444 (58.26%)	2,643 (53.01%)	2,905 (55.98%)	1,796 (53.87%)	1,851 (5614%)
Lexical density (content words/total)	42%	47%	44%	46%	44%
Average LD for entire corpus			**44.6%**		

[15] I excluded false starts that have no meaning, e.g. when a speaker says 'ba- basically', but not when a false start begins with a complete word e.g. 'she be- she found'.
[16] For example, the LD of the *British-literature* lecture with fillers and false starts is .48, and without these irregularities it is .44, thus it seems important to exclude them.
[17] The *Nineteenth-century literature* lecture contains some excerpts from the *Middlemarch* prelude, and in the *Poetry* lecture, the poem '*I have a dream*' was read aloud.
[18] The total word count for these lectures has changed here. For example, the *Techniques* transcript is 5,652 before uploading it to the WebVocabProfile, but this number increased because, according to the WebVocabProfiler website, contractions are replaced by constituent words.

As Table 4-2 shows, lectures generally contain less than one-third of content words, and more than half of the words are function words. The study's entire corpus exhibits a slightly high LD, with an average of 45%, and a slight tendency towards the written side of the oral-written continuum based on Ure (1971). The LD ranges from 42% in the *Techniques* lecture to 47% in the *Nineteenth-century Literature* lecture. The overall LD mean suggests that, despite these lectures containing a higher proportion of function words compared to content words, they tend to exhibit some written-discourse characteristics because their LD is above .40. Thus, these lectures seem to be lexically dense.

4.3.2 Lexical frequency

There is also ample evidence that L2 vocabulary size (particularly vocabulary breadth, as Vandergrift and Goh (2012) note) is an essential foundation and a good, if not the best, predictor of listening success (Andringa et al., 2012; Bonk, 2000; Kelly, 1991; Mecartty, 2000; Vandergrift & Baker, 2015). For example, Vandergrift and Baker (2015), when examining how some cognitive learner variables interact and lead to successful listening, confirm the robust impact of L2 vocabulary on listening. They found that L2 vocabulary accounted for about 49% of the variance in L2 listening in a model also including these factors: auditory discrimination, WM, L1 vocabulary and metacognition.

Considering the corpus-based frequency of words, Révész and Brunfaut (2013) found that lexical frequency (content and function words among the 1,000–2,000 most frequently used words) pose less difficulty, yet a higher incidence of academic words (which typically constitute low-frequency words) in a text is significantly more difficult for L2 listeners. This echoes the findings of Nissan, DeVincenzi and Tang (1996), who observed that low-frequency vocabulary contributes significantly to the difficulty of TOEFL dialogue items. Meanwhile, Ying-hui (2006) and Yanagawa and Green (2008) observed no significant correlation between infrequent lexis and listening difficulty.

To conclude, although research has yielded mixed results on the impact of lexical frequency on L2 listening, most studies confirm that lexical frequency is important for

listening. At the same time, these studies also suggest that, as Vandergrift and Goh (2012) state, a high percentage of variance remains to be accounted for by other factors in successful listening. The following paragraphs describe the method used for analysing lexical frequency as well as the analyses themselves in this study.

I analysed vocabulary frequency using Schmitt and Schmitt's (2012) lexical frequency classification. They claim that Nation's (2011) four-part categorisation of vocabulary frequency (high frequency, academic, technical, and low frequency) might be invalid in L2 teaching. Schmitt and Schmitt's classification comprises 1) high-frequency vocabulary, which includes the top 3,000 word families; 2) low-frequency vocabulary, which starts in the 9,000-word frequency band, and 3) a new category labelled 'mid-frequency', which lies between the 3,000- and 9,000-word frequency bands. Schmitt and Schmitt's classification is a recent and clear classification of vocabulary frequency. I feel it is appropriate for an NA because they carefully define boundaries between word frequency bands, and they emphasise the importance of calculating and explicitly addressing mid-frequency words in teaching/ testing L2 listening (i.e. those words covered between high-frequency and low-frequency words). Additionally, as the analysis of the corpus will show below, the lecture listeners in the study's TLU situation do encounter mid-frequency words and do so more often than low-frequency words; Nation's classification does not capture this. Schmitt and Schmitt's classification does not include technical vocabulary as a category in their classification, whereas Nation's does, because technical words could stem from these three categories (high, mid, low). This often requires generating a technical vocabulary list in a specific domain, which should be clearly distinguished from vocabulary frequency classifications, and learning high-, mid- and low-frequency words can be a head start to learning lists of technical words in a specific domain.

Here, vocabulary frequency was analysed using VP-Compleat English BNC1-20[19] (Codd, n.d.). The BNC1-20 frequency framework (as opposed to other frameworks, e.g. BNC-COCA-20) was chosen because BNC1-20 accommodates spoken data by basing the first K2 frequency bands on a speech corpus, as Nation (2006) indicates. BNC1-20 vocabulary profiles were generated for the lecture corpus as a whole

[19] BNC = The British National Corpus.

(Figure 4-1) as well as for each individual lecture (Figs 4-2, 4-3, 4-4, 4-5, 4-6) to illustrate the distribution and frequency of vocabulary. The same transcripts that were slightly edited for LD were also submitted for lexical frequency analysis. Lists showing examples of word types at each 1,000-frequency level in the high-, mid- and low-frequency categories for each lecture are presented in Appendix D.

Freq. Level	Families (%)	Types (%)	Tokens (%)	Cumul. token %
K-1 Words :	647 (48.94)	1155 (55.05)	18999 (86.92)	86.92
K-2 Words :	288 (21.79)	401 (19.11)	1243 (5.69)	92.61
K-3 Words :	135 (10.21)	164 (7.82)	457 (2.09)	94.70
K-4 Words :	84 (6.35)	106 (5.05)	401 (1.83)	96.53
K-5 Words :	46 (3.48)	53 (2.53)	132 (0.60)	97.13
K-6 Words :	31 (2.34)	37 (1.76)	85 (0.39)	97.52
K-7 Words :	23 (1.74)	29 (1.38)	90 (0.41)	97.93
K-8 Words :	15 (1.13)	20 (0.95)	45 (0.21)	98.14
K-9 Words :	9 (0.68)	11 (0.52)	19 (0.09)	98.23
K-10 Words :	10 (0.76)	11 (0.52)	29 (0.13)	98.36
K-11 Words :	14 (1.06)	18 (0.86)	76 (0.35)	98.71
K-12 Words :	5 (0.38)	5 (0.24)	9 (0.04)	98.75
K-13 Words :	7 (0.53)	8 (0.38)	22 (0.10)	98.85
K-14 Words :				
K-15 Words :	3 (0.23)	4 (0.19)	10 (0.05)	98.90
K-16 Words :	1 (0.08)	1 (0.05)	4 (0.02)	98.92
K-17 Words :	4 (0.30)	4 (0.19)	16 (0.07)	98.99
K-18 Words :				
K-19 Words :				
K-20 Words :				
Off-List:	??	71 (3.38)	221 (1.01)	100.00
Total (unrounded)	1322+?	2098 (100)	21858 (100)	≈100.00

Figure 4-1: Linguistics-literature corpus vocabulary profile

Freq. Level	Families (%)	Types (%)	Tokens (%)	Cumul. token %
K-1 Words :	372 (73.08)	548 (75.59)	5029 (89.28)	89.28
K-2 Words :	85 (16.70)	108 (14.90)	315 (5.59)	94.87
K-3 Words :	16 (3.14)	19 (2.62)	70 (1.24)	96.11
K-4 Words :	19 (3.73)	23 (3.17)	156 (2.77)	98.88
K-5 Words :	6 (1.18)	6 (0.83)	13 (0.23)	99.11
K-6 Words :	5 (0.98)	5 (0.69)	15 (0.27)	99.38
K-7 Words :	1 (0.20)	1 (0.14)	1 (0.02)	99.40
K-8 Words :	3 (0.59)	4 (0.55)	7 (0.12)	99.52
K-9 Words :	2 (0.39)	3 (0.41)	8 (0.14)	99.66
K-10 Words :				
K-11 Words :				
K-12 Words :				
K-13 Words :				
K-14 Words :				
K-15 Words :				
K-16 Words :				
K-17 Words :				
K-18 Words :				
K-19 Words :				
K-20 Words :				
Off-List:	??	8 (1.10)	19 (0.34)	100.00
Total (unrounded)	509+?	725 (100)	5633 (100)	≈100.00

Figure 4-2: Teaching techniques lecture vocabulary profile

Freq. Level	Families (%)	Types (%)	Tokens (%)	Cumul. token %
K-1 Words :	348 (62.70)	494 (64.16)	4111 (85.10)	85.10
K-2 Words :	84 (15.14)	105 (13.64)	267 (5.53)	90.63
K-3 Words :	38 (6.85)	42 (5.45)	103 (2.13)	92.76
K-4 Words :	26 (4.68)	32 (4.16)	62 (1.28)	94.04
K-5 Words :	13 (2.34)	16 (2.08)	50 (1.03)	95.07
K-6 Words :	9 (1.62)	10 (1.30)	13 (0.27)	95.34
K-7 Words :	9 (1.62)	10 (1.30)	29 (0.60)	95.94
K-8 Words :	5 (0.90)	6 (0.78)	20 (0.41)	96.35
K-9 Words :	2 (0.36)	3 (0.39)	3 (0.06)	96.41
K-10 Words :	4 (0.72)	4 (0.52)	7 (0.14)	96.55
K-11 Words :	8 (1.44)	11 (1.43)	53 (1.10)	97.65
K-12 Words :	3 (0.54)	3 (0.39)	6 (0.12)	97.77
K-13 Words :	2 (0.36)	2 (0.26)	3 (0.06)	97.83
K-14 Words :				
K-15 Words :	2 (0.36)	3 (0.39)	5 (0.10)	97.93
K-16 Words :	1 (0.18)	1 (0.13)	4 (0.08)	98.01
K-17 Words :	1 (0.18)	1 (0.13)	4 (0.08)	98.09
K-18 Words :				
K-19 Words :				
K-20 Words :				
Off-List:	??	26 (3.38)	91 (1.88)	99.97
Total (unrounded)	555+?	770 (100)	4831 (100)	≈100.00

Figure 4-3: Nineteenth-century literature lecture vocabulary profile

Freq. Level	Families (%)	Types (%)	Tokens (%)	Cumul. token %
K-1 Words :	308 (62.35)	433 (64.05)	4205 (84.40)	84.40
K-2 Words :	96 (19.43)	120 (17.75)	405 (8.13)	92.53
K-3 Words :	32 (6.48)	38 (5.62)	123 (2.47)	95.00
K-4 Words :	13 (2.63)	15 (2.22)	55 (1.10)	96.10
K-5 Words :	10 (2.02)	11 (1.63)	21 (0.42)	96.52
K-6 Words :	8 (1.62)	10 (1.48)	28 (0.56)	97.08
K-7 Words :	7 (1.42)	10 (1.48)	36 (0.72)	97.80
K-8 Words :	4 (0.81)	5 (0.74)	9 (0.18)	97.98
K-9 Words :	3 (0.61)	3 (0.44)	4 (0.08)	98.06
K-10 Words :	4 (0.81)	5 (0.74)	20 (0.40)	98.46
K-11 Words :	3 (0.61)	4 (0.59)	15 (0.30)	98.76
K-12 Words :	1 (0.20)	1 (0.15)	1 (0.02)	98.78
K-13 Words :	2 (0.40)	3 (0.44)	14 (0.28)	99.06
K-14 Words :				
K-15 Words :	1 (0.20)	1 (0.15)	4 (0.08)	99.14
K-16 Words :				
K-17 Words :	2 (0.40)	2 (0.30)	10 (0.20)	99.34
K-18 Words :				
K-19 Words :				
K-20 Words :				
Off-List:	??	14 (2.07)	32 (0.64)	99.98
Total (unrounded)	494+?	676 (100)	4982 (100)	≈100.00

Figure 4-4: Poetry lecture vocabulary profile

Freq. Level	Families (%)	Types (%)	Tokens (%)	Cumul. token %
K-1 Words :	282 (71.03)	382 (72.76)	2889 (89.69)	89.69
K-2 Words :	43 (10.83)	50 (9.52)	100 (3.10)	92.79
K-3 Words :	26 (6.55)	33 (6.29)	98 (3.04)	95.83
K-4 Words :	19 (4.79)	24 (4.57)	55 (1.71)	97.54
K-5 Words :	12 (3.02)	12 (2.29)	32 (0.99)	98.53
K-6 Words :	8 (2.02)	10 (1.90)	18 (0.56)	99.09
K-7 Words :	2 (0.50)	2 (0.38)	2 (0.06)	99.15
K-8 Words :	1 (0.25)	2 (0.38)	5 (0.16)	99.31
K-9 Words :	2 (0.50)	3 (0.57)	3 (0.09)	99.40
K-10 Words :				
K-11 Words :	1 (0.25)	1 (0.19)	3 (0.09)	99.49
K-12 Words :				
K-13 Words :				
K-14 Words :				
K-15 Words :	1 (0.25)	1 (0.19)	1 (0.03)	99.52
K-16 Words :				
K-17 Words :				
K-18 Words :				
K-19 Words :				
K-20 Words :				
Off-List:	??	5 (0.95)	15 (0.47)	99.99
Total (unrounded)	397+?	525 (100)	3221 (100)	≈100.00

Figure 4-5: Sociolinguistics lecture vocabulary profile

Freq. Level	Families (%)	Types (%)	Tokens (%)	Cumul. token %
K-1 Words :	357 (66.60)	493 (68.47)	2763 (86.64)	86.64
K-2 Words :	82 (15.30)	95 (13.19)	156 (4.89)	91.53
K-3 Words :	38 (7.09)	44 (6.11)	63 (1.98)	93.51
K-4 Words :	19 (3.54)	22 (3.06)	73 (2.29)	95.80
K-5 Words :	11 (2.05)	12 (1.67)	16 (0.50)	96.30
K-6 Words :	6 (1.12)	7 (0.97)	11 (0.34)	96.64
K-7 Words :	9 (1.68)	11 (1.53)	22 (0.69)	97.33
K-8 Words :	3 (0.56)	4 (0.56)	4 (0.13)	97.46
K-9 Words :	1 (0.19)	1 (0.14)	1 (0.03)	97.49
K-10 Words :	2 (0.37)	2 (0.28)	2 (0.06)	97.55
K-11 Words :	3 (0.56)	3 (0.42)	5 (0.16)	97.71
K-12 Words :	1 (0.19)	1 (0.14)	2 (0.06)	97.77
K-13 Words :	3 (0.56)	3 (0.42)	5 (0.16)	97.93
K-14 Words :				
K-15 Words :				
K-16 Words :				
K-17 Words :	1 (0.19)	1 (0.14)	2 (0.06)	97.99
K-18 Words :				
K-19 Words :				
K-20 Words :				
Off-List:	??	21 (2.92)	64 (2.01)	100.00
Total (unrounded)	536+?	720 (100)	3189 (100)	≈100.00

Figure 4-6: British-literature lecture vocabulary profile

Based on the corpus data as a whole (Figure 4-1) and the 'tokens'[20] column, the largest numbers of words (94.7%) mostly come from bands K1, K2 and K3 of the BNC, i.e. high-frequency words, with most of them being K1 words (86.92%).

By looking at individual vocabulary profiles for each lecture, some slight differences are apparent. For example, 95.83% of the lexis of the *Sociolinguistics* lecture and 96.11% of the *Techniques* lecture are high-frequency words. Meanwhile, 92.76% of the lexis of the lecture on the *Nineteenth-century Literature*, 95% on

[20] 'Types' refer to word forms, whereas 'tokens' indicate occurrences of word forms.

Poetry and 93.51% on *British Literature* are high-frequency words. The literature lectures appear to have a lower percentage of high-frequency lexis than the two linguistics ones.

Furthermore, the corpus contains mid- (K4–K8) and low-frequency (K9+) words, albeit in small numbers, compared to high-frequency words. Figure 4-1 shows that these range from the K4 to the K17 frequency band in this corpus: 3.44% mid-frequency words, 0.85% low-frequency words. According to the individual vocabulary profiles, the lowest mid-frequency percentage is 2.98% for the *Poetry* lecture, followed by the *Techniques* lecture (3.41%) and the *Sociolinguistics* lecture (3.48%), whereas the highest is 3.95% for the *British Literature* lecture.

The lowest proportion of low-frequency words percentage was found for the *Techniques* lecture (0.14%) and *Sociolinguistics* lecture (0.21%), whereas the highest was 1.74% for the *Nineteenth-century Literature* lecture and 1.36% for the *Poetry* lecture. Literature lectures thus appear to contain slightly more mid- and low-frequency words than linguistics ones.

4.3.3 Technical vocabulary

Mastering technical (disciplinary) vocabulary is an integral part of subject-matter learning (Basturkmen & Shackleford, 2015; Crawford-Camiciottoli 2007; Gablasova, 2015; Woodward-Kron, 2008). Nation (2001) defines technical vocabulary as words 'recognisably specific to a particular topic, field or discipline' (p.198). According to Chung and Nation (2004) and Nation (2001), technical vocabulary usually comprises low-frequency words that are not often encountered in other disciplines, they are typically restricted to a particular discipline. They can also be high-frequency words that have a specialised sense.

Gablasova (2015) argues that disciplinary vocabulary is usually considered to be one of the most challenging areas for NNS students. Several studies (e.g. Evans & Morrison, 2011; Basturkmen & Shackleford, 2015; Gablasova, 2015) show that NNS students seem to struggle to understand, learn and use technical words, or 'jargon'. Woodward-Kron (2008) believes that disciplinary vocabulary imposes a cognitive load when processing it; for example, students doing science encounter Greco-

Latinate affixes and roots, while humanities students encounter abstract words and concepts, which may raise a barrier to comprehension. Conversely, Gablasova (2015) states that difficulties with processing technical vocabulary might be due to low L2 mastery, particularly, a small vocabulary size. Next, the instrument used and the procedure followed to identify technical vocabulary in this study and the analyses are described.

Chung and Nation (2004) suggest four methods to identify technical vocabulary in a domain: 1) specialists can determine whether a word meaning is closely related to the subject using a four-step-rating scale, 2) using technical dictionaries, 3) searching for clues provided by the writer when referring to important terms, or 4) performing a computer-based comparison of the frequency or non-frequency of its occurrence in specialised texts with that in a large general corpus. For this study, I selected a computer-based approach to generate a discipline-specific wordlist from the linguistics-literature corpus because this method is quick, easily applied and does not require deep knowledge of the subject area being examined (Chung & Nation, 2004).

I decided to run a non-technical comparison of the technical corpus (linguistics-literature corpus) and a large technical corpus consisting of British Academic Spoken English (BASE[21]) and Brezina and Gablasova's (2013) New General Service List (New-GSL).[22] I downloaded all the BASE transcript files from the University of Warwick's BASE webpage and generated a wordlist (1,504,215 tokens) using WordSmith Tools (WST) (Scott, n.d.). BASE lecture transcripts from the same specialised areas (linguistics, English, applied linguistics and teacher training) were deleted. A comparison was run on the wordlists of the linguistics-literature corpus (generated from WST) and the other two non-technical lists (New-GSL and BASE) using WST's match-list tool. This tool allowed all the entries that occurred in the non-technical lists to be filtered out. Thus, the remaining words could be classified as technical vocabulary based on the frequency criterion, which holds that technical

[21] BASE consists of 1,644,942 tokens from 160 audio-recorded and video-taped lectures and 40 seminars compiled from a variety of departments at the Universities of Warwick and Reading.

[22] The New-GSL consists of 2,500 lemmas and is based on a comparison of four language corpora. New-GSL is regarded as useful for receptive and productive vocabulary (Brezina & Gablasova, 2013).

words ‘occur only in the technical corpus (a ratio of infinity)’ (Chung & Nation, 2004, p.259).

The results are presented in Appendix E. Out of 22,018 tokens[23], 239 words, most of which are nouns and adjectives, remained that can be considered technical vocabulary. The list contains words from both literature- and linguistics-oriented lectures. The top words in this list, which are mentioned about five times or more in the corpus, belong to literature lectures: e.g. ‘simile’, ‘thematic’ and ‘stanza’. The list also includes words that do not seem to be discipline-exclusive, e.g. ‘eagle’, ‘punctuation’, ‘lessen’, ‘poems’ and ‘rhyme’, and can also be found in everyday language, yet they are considered to be technical vocabulary because they are conceptually important in their context.

4.3.4 Formulaic expressions

Formulaic expressions refer to multiword units which have a meaning that is different from that of their separate words (Révész & Brunfaut, 2013). Conklin and Schmitt (2008) found that multiword units might cause ‘a processing advantage over creatively generated language’ (p.72). This is probably because, as Kuiper (1996) believes, the more one relies on formulas, the easier it is to retrieve something from long-term memory rather than construct it anew, particularly when processing speech that might impose greater demands on WM because it occurs in real time.

Kremmel, Brunfaut and Alderson (2015) found that phraseological knowledge is a much stronger predictor of FL reading than syntax or lexis. Brunfaut and Révész (2015) likewise detected that passages containing larger numbers of K3 frequency band multiword expressions (e.g. ‘rely on’), the most frequent multiword expressions in a general written genre (e.g. ‘deal with’) and less frequent multiword expressions in written academic genres (e.g. ‘in fact’) significantly facilitate listening processing. Meanwhile, multiword expressions that rarely appear in written academic genres (e.g. sort of) prove significantly more taxing for L2 listeners. The next paragraphs explain how formulaic expressions were determined and what was found in this study.

[23] Excluding fillers and false starts.

Here, formulaic expressions are identified based on Simpson-Vlach and Ellis (2010) Academic Formulas List (AFL) of the 200 most-frequent two-, three-, four- and five-word sequences, using a file-based concordance tool in WordSmith which enables matching the expressions appearing in their list with those in the study's corpus. Simpson-Vlach and Ellis's list seems to be useful because it is based on two spoken corpora, BNC and MICASE[24] (which includes real lectures), unlike other lists, e.g. the Phrasal Expressions list from Martinez & Schmitt (2012), used in Révész and Brunfaut (2013), which is based only on the BNC, which does not contain lectures. As shown in Table 4-3, all the identified multiword expressions were then grouped according to the discourse-pragmatic functions classified by Simpson-Vlach and Ellis (2010) (see Appendix F for a list of formulaic expressions that appeared and those that did not).

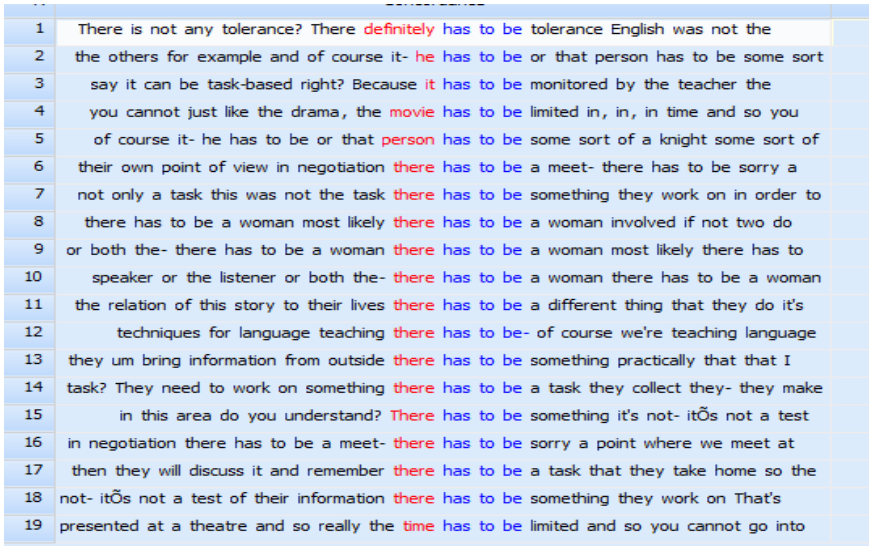
Table 4-3: Formulaic expressions grouped by function and frequency

Group A Referential expressions
(1) Specification of attributes (a) Intangible framing attributes this kind of (1)[25]
(2) Identification and focus this is the (9) and this is (2) so this is (8) has to do with (1) there was a (4) it's gonna be (1)
(3) Contrast and comparison to do with (3) to each other (1)
(4) Deictics and locatives and the end of the (1) the end of the (1) the end of (1) at the end (3) the end of (1) the end of the (1)
Group B Stance expressions
(1) Hedges it could be (1) it might be (1) a kind of (4)
(2) Epistemic stance you know what I mean (18) you can see (4) what does that mean (2)

[24] Michigan Corpus of Academic Spoken English

[25] Number of occurrences

what do you mean	(2)
and you can see	(1)
and you can	(2)
do you know what	(8)
(3) Obligation and directive	
has to be	(19)
you want to	(3)
it has to be	(1)
we have to	(2)
tell me what	(1)
(4) Expressions of ability and possibility	
so you can see	(2)
be able to	(3)
you can see that	(2)
that you can	(1)
you're trying to	(1)
(5) Intention/volition, prediction	
if you want to	(2)
I wanted to	(1)
Group C Discourse organizing functions	
(1) Metadiscourse and textual reference	
we're talking about	(2)
we talked about	(5)
we'll talk about	(1)
to talk about	(2)
what you're saying	(2)
talk about the	(2)
we talk about	(1)
talking about the	(2)
(2) Topic introduction and focus	
look at the	(13)
you have a	(14)
you look at	(1)
if you have	(2)
first of all	(2)
let's look at	(10)
look at it	(1)
looking at the	(1)
we're looking at	(1)
if you have a	(1)
look at this	(2)
we look at	(2)
(3) Topic elaboration (non-causal)	
come up with	(4)
you know what	(18)
so if you	(1)
come up with	(4)
what happens is	(1)
(4) Discourse markers	
oh my god	(1)
yes yes yes	(1)
at the end of	(1)
and then you	(3)
and if you	(1)



1	There is not any tolerance? There definitely has to be tolerance English was not the
2	the others for example and of course it- he has to be or that person has to be some sort
3	say it can be task-based right? Because it has to be monitored by the teacher the
4	you cannot just like the drama, the movie has to be limited in, in, in time and so you
5	of course it- he has to be or that person has to be some sort of a knight some sort of
6	their own point of view in negotiation there has to be a meet- there has to be sorry a
7	not only a task this was not the task there has to be something they work on in order to
8	there has to be a woman most likely there has to be a woman involved if not two do
9	or both the- there has to be a woman there has to be a woman most likely there has to
10	speaker or the listener or both the- there has to be a woman there has to be a woman
11	the relation of this story to their lives there has to be a different thing that they do it's
12	techniques for language teaching there has to be- of course we're teaching language
13	they um bring information from outside there has to be something practically that that I
14	task? They need to work on something there has to be a task they collect they- they make
15	in this area do you understand? There has to be something it's not- itÕs not a test
16	in negotiation there has to be a meet- there has to be sorry a point where we meet at
17	then they will discuss it and remember there has to be a task that they take home so the
18	not- itÕs not a test of their information there has to be something they work on That's
19	presented at a theatre and so really the time has to be limited and so you cannot go into

Figure 4-7: Sample of concordance output for 'has to be'

Based on Table 4-3, the study's corpus contains 68 out of 200 formulaic expressions from Simpson-Vlach and Ellis's list. The most frequent phrase is 'has to be' (Figure 4-7), a verb phrase that is often used to direct the listener to attend to something in the message (Simpson-Vlach & Ellis, 2010). The second most frequent phrase is 'you know what I mean', indicating an epistemic stance formula associated with thoughts, knowledge claims and beliefs (Simpson-Vlach & Ellis, 2010).

Most of the expressions in Table 4-3, however, are associated with the 'discourse organising function' group, particularly the subcategory 'topic introduction and focus'. The former subcategory has 12 phrases, such as 'look at the', 'first of all' and 'let's look at', which are often used to introduce an upcoming segment of discourse (Simpson-Vlach & Ellis, 2010).

4.3.5 Speech rate

Scholars such as Buck (2001) believe that a fast speech rate (SR) may affect L2 listening, often as a result of 'a lack of processing automaticity' (p.38). Research on SR has yielded mixed findings. Some research (Griffiths, 1992; Zhao, 1997; Brindley & Slatyer, 2002) supports the hypothesis that the faster the SR, the lower the L2 comprehension. For example, Griffiths (1992) found that a SR higher than 250 words per minute (wpm), regarded as fast, and an average SR of 188 wpm negatively affected the comprehension of ESL lower-intermediate participants listening to

stories. But when listening to a passage spoken at 127 wpm, the participants performed well on comprehension questions.

Other studies, however, have shown that a slower SR does not necessarily benefit L2 listeners (Blau, 1990; Derwing & Munro, 2001; King & East, 2011; Révész & Brunfaut, 2013). For example, King and East (2011) observed that listening to input played once at a slow SR did not appear to influence listening, as measured by multiple-choice and fill-in-the-blank tests. Participants did not perceive this condition to be easier than the other two test conditions (listening once at normal speed and listening to input played twice, which was perceived as the most preferred condition and had a significant positive impact on scores). The following paragraphs describe how SR was analysed in this study, along with the analyses themselves.

To analyse the SR, I opted to follow past research in calculating wpm to give SRs (e.g. Crawford-Camiciottoli, 2007; Nesi, 2001). I divided the number of total words in a transcript by the duration of a lecture in minutes (Table 4-4). Despite the inaccuracy of wpm calculations, which treat monosyllabic and multisyllabic words as equal (Bloomfield et al., 2011; Révész & Brunfaut, 2013), they have been used with long lectures for practical reasons. It is hoped that wpm calculations provide a global picture of the range of SRs in this TLU situation. A few very short pauses, oral readings and writing sections on the whiteboard were not subtracted from lecture duration because the length of the lectures would make this task extremely labour-intensive.

Table 4-4: Speech rates

Lecture	Word count	Minutes	WPM
Teaching techniques	5,683	45.72	124.30
Nineteenth-century Literature	5,066	50.66	100.00
Poetry	5,056	41.00	123.31
Sociolinguistics	3,272	23.32	140.30
British Literature	3,514	24.47	143.60
Mean	**126.30**		

Based on Table 4-4*, Nineteenth-century Literature* lecture, which had the slowest SR (100/wpm), included reading aloud the entire prelude of *Middlemarch*, followed

by explanations after each excerpt. *British Literature* lecture, which had the highest SR (144/wpm), followed a traditional lecture style, in which the speaker dominated. *Techniques* and *Poetry* lectures had similar SRs (124 and 123/wpm, respectively), and both speakers, as observed, often wrote on the board. Although the *Sociolinguistics* lecture had a more conversational style, it had the second highest SR (140/wpm); the lecturer referred frequently to PowerPoint slides but did not read text out loud or write on the board.

As seen in Table 4-4, and following Tauroza and Allison's (1990) SRs classification, based on analysing 22 lectures given by British NSs to NNSs, none of the lectures in this corpus were faster than normal (185/wpm), moderately fast (160–185/wpm) or slower than normal (100/wpm). For this corpus, the mean SR was 126/wpm, towards the low end of the continuum for average SR (125–160) and almost at the high end of the moderately slow category (100–125) in Tauroza and Allison's classification. Individually, three of the lectures fall within the moderately slow category, whereas the other two lectures are solidly in the average category.

4.3.6 Non-restrictive 'which' clauses

While researchers such as Flowerdew and Miller (2005) and Vandergrift and Goh (2012) believe that syntactic knowledge is not always essential because, for example, successful listeners allocate more attention to semantic cues which carry more meaning than grammatical cues that might contribute less to the meaning of a passage (Vandergrift & Goh, 2012), the opposite view is held by other researchers. For example, Kostin (2004) and Révész and Brunfaut (2013) hypothesise that syntactic complexity might affect L2 listening because the more complex the grammar, the more difficult it is to process.

Studies investigating the relationship between syntactic knowledge and L2 listening have produced different findings. For example, Mecartty (2000) correlated the scores of learners of Spanish on a comprehension test of the main and supporting ideas in two expository texts with their performance on two assessment tasks (a grammaticality judgement task and a sentence-completion multiple-choice task); however, there was no correlation between listening and grammar. Meanwhile, Joyce (2011) correlated the scores of Japanese learners of English on composite KEPT-

TOEFL with a commercially produced grammar aural test (LCT) and found that syntactic knowledge made the greatest independent contribution to listening (r=0.81).

One area of syntax that is somewhat complex, regardless of its type, is the relative clause[26] (RC) (MacDonald, 2013). It is believed that RCs, unlike simple sentences, can create processing problems for L2 learners in terms of both comprehension and production (Yamashita, 1994). The more information that is added, the more complicated the utterance/sentence becomes (Yamashita, 1994), and this might lead to processing difficulties mainly due to WM capacity limitations (MacDonald, 2013). For example, Romeo (2008) generally found that longer sentences (subjects' and objects' RCs), as measured by reaction-time instruments, take more time to be processed in L2 listening than shorter ones.

Given the importance of RCs in academic listening, I examined the use of *which*- as a non-restrictive relative clause (WNRRC) in terms of types and functions. Interest in this grammatical structure comes from the realisation that NRRCs[27], as Tao & McCarthy (2001) and Yamashita (1994) indicate, are typically seen as a complex feature in spoken grammar, since the referent of the antecedent is not defined/identified. Also, NRRCs are separated by a dash or comma in written form (Tao & McCarthy, 2001; Yamashita, 1994), but L2 listeners might not recognise them in speech due to the absence of such visual cues (Crawford-Camiciottoli, 2007). Crawford-Camiciottoli (2007) argues that NRRCs are important in lectures, as lecturers often use them 'to signal important content and not just to mark omissible information as described in standard grammars' (p.72). The focus on WNRRCs was adopted because it was expected to occur more than other types of NRRC (starting with *who*) in this corpus, and to serve as an example of this syntactic feature.

Here, I first searched for all utterances with *which* using the concordance tool in WordSmith. Then, I studied all instances of *which* and deleted all which-restrictive clauses, 'which' in questions and the expression 'in which'. Table 4-5 presents WNRRC instances according to their structures as identified by Crawford-Camiciottoli (2007).

[26] Relative clauses are noun modifiers including a verb (MacDonald, 2013).

[27] An example of an NRRC is 'Have you seen her new house, which she bought last year?' (Crawford-Camiciottoli, 2007, p.68). The 'which' clause is unimportant to the first clause that identifies the house.

Table 4-5: Which non-restrictive, relative clause

WNRRC structures	Frequency
Which + Copular be	
-is/are	7
-was/were	1
-has been	0
-would be	3
Which+other verb	4
Which+modal verb	2
Which+modal expression	1
Which+discourse marker	0
Total	**18**

As Table 4-5 shows, 18 occurrences of WNRRCs were found in four lectures except the *Sociolinguistics* lecture, and most of them were in the *Nineteenth-century literature* lecture. The most frequent type was 'which + copular (is)', with seven instances. According to Tao and McCarthy's (2001) classification of the roles of WNRRCs as 'expansive', 'evaluative' and 'affirmative', most of the WNRRCs employed in these lectures were used to expand and offer additional information. Below are two examples of WNRRC:

Quote/4.1
'…Such hindrances are the social restrictions imposed upon the lives of women *which* act as obstacles in the way of realising their dreams of glorious lives, of epic lives, of lives of great achievements'. (*Expansion* – Lecture/2/*Middlemarch*).

Quote/4.2
'His books are full of unimportant details and they're very, very long, they have so many repetitions as well, they're written in the form of letters *which* are exchanged between characters, and this method because, you know in a letter if you're sending a letter to a friend or a relative, you would pour your feelings and thoughts freely into it'. *(Expansion* – Lecture/5/*Rise-of-the-novel*).

4.4 Analysis of discourse (Part 2)

This section explains how corpus data were analysed and what was specifically found from a discourse perspective.

4.4.1 Setting up a coding scheme

The qualitative analyses used for this phase and the following phases are based on thematic analysis (TA). Braun and Clarke (2006) identify two primary ways to begin TA: inductive bottom-up and deductive top-down. According to Saldaña (2013), applying coding in a deductive or inductive manner – a process typically called provisional coding – allows for the creation of 'a provisional start list' of codes (p.144). Such a provisional list, as Miles and Huberman (1994) mention, can be developed based on existing theoretical frameworks/models. The researcher thus anticipates some of the codes and categories that may emerge in the data (Saldaña, 2013) and forces the data into already identified codes (Miles & Huberman, 1994). Maxwell (2012) and Miles and Huberman (1994) warn against neglecting prior analytical theoretical frameworks, as their absence might cause the researcher to miss important theoretical insights. At the same time, Maxwell (2012) and Miles and Huberman (1994) assert that using codes based on a conceptual framework should not be exclusively imposed on the data; rather, new insights can be added based on already known concepts from the literature. Finally, Creswell and Plano Clark (2011) conclude that the use of a theoretical foundation in mixed-methods studies can work as 'a stance or lens or a standpoint to provide the researcher with direction' (p.47).

Based on the above discussion, the transcripts were first imported into ATLAS.ti. After reading them thoroughly, I coded the data deductively in a top-down approach. I started with codes based on Field's (2013) model and tried to link them to the data. During this stage, I broke down Field's processes into their constituents (sub-skills) based on the functions of these processes. Whilst trying to apply these initial codes, I found that Field's lower-level processes could not be applied as they appear in his original description, as they are highly implicit in lectures and are only coded when vocalised by the speaker, e.g. 'What does this word mean?' This indicates a lexical search process. I also found that Field's redundancy is expressed in general terms, which risks reducing information. Therefore, redundancy was separated into four

codes taken from Chaudron (1998): synonyms, exact repetition, paraphrasing and glosses. Further, I used Halliday and Hasan's (1976) cross-referencing and conjunctions lists to look for these features in the transcripts, because cross-referencing and conjunctions in Field's model are expressed in general terms. Further, WordSmith was used to find these items because the manual use of such lists is subject to human error.

Keeping in mind that I should be open to new ways of thinking about the data, I attempted to link aspects in the data not covered by Field to other models. Because Field's (2013) model lacks aspects of intertextuality, I used the contextualised dimension explained by Flowerdew and Miller (2005), that was later linked to Khalifa and Weir's (2009) model. Further, Young's (1994) model was used to elaborate other aspects found in the data, e.g. interaction, discourse structuring, examples and summarising, which Field does not include. The theory/content code based on Young's (1994) model was removed, because a lecture in its entirety primarily delivers such content that would be hard to isolate. I also added two cognitive strategies (transfer and translation) from Vandergrift and Goh's (2012) model. Moreover, new codes emerged at this stage. For example, comprehending metaphors, voice-tone inferences and decoding student speech were inserted into the codes list, to be grouped later via a suitable process using classification reasoning. Finally, after later coding rounds, I developed a more bottom-up approach and drafted a coding scheme containing 38 codes for cognitive processing (Appendix G). I also grouped these codes together and created higher-level codes based on the cognitive processes in Field (2013) and Khalifa and Weir (2009). This coding scheme was used while coding the five lectures.

While establishing codes, I frequently used gerunds to connote action at work during lectures in the text (e.g. 'drawing attention to…' or 'recognising…'). Such a coding method is known as 'process/action coding' (Saldaña, 2013). I inferred what sub-skills were employed (in relation to cognitive listening processes) because processes and sub-skills are usually embedded and considered to be 'things people do rather than something people have' (Willig, 2008, p.164). Additionally, several sub-skills often occurred simultaneously, thus the same quote was associated with multiple codes. This process, as Saldaña (2013) mentions, is called 'simultaneous

coding', which requires splitting data rather than lumping them together to allow a more nuanced analysis.

For example, in the excerpt in Figure 4-8, 12 different codes are linked to it. For instance, the lecturer was talking about the differences in the way literature (novels) was written in the earlier part of the 18th century, when writing literature was based on the classical school, compared to the tools used by writers during the second half of the 18th century, when they abandoned those earlier rules. During this part of the lecture, the listener needed to recognise differences in works of art across the ages; therefore, it was coded as identifying similarities and differences between ideas. As another example, because the lecturer mentioned things relating to the higher and middle classes and democratic ideals, the listener needed to bring in general information/world knowledge to understand what was being said. Therefore, the text was coded as activating world background knowledge. Finally, to check the intra-reliability of the coding, I re-coded two lecture transcripts after about two months. The following overall reliability coefficient results were gained, producing acceptable agreement scores: p (agreement) .87, expected p (agreement) 0.90 and Brennan-Prediger .75. Of note, upon completing the analyses of this phase and the following phases, I presented a data sample with codes, quotes and definitions to the researcher's supervisor, who is an expert on language cognitive processing. She left comments and suggested changes, which were then implemented.

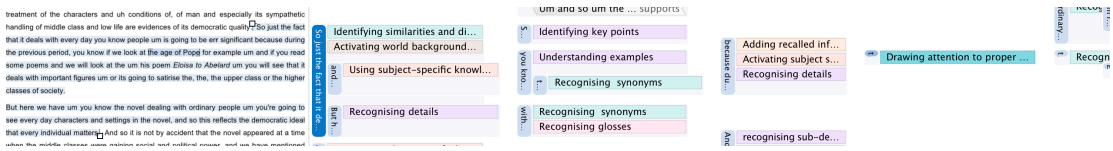


Figure 4-8: Example of coding in Phase 1

4.4.2 Analysis of discourse findings

According to the literature reviewed in Chapter 2, listening cognitive processing combines two stages: 1) *lower-level processing* incorporating input decoding, lexical search, and syntactic parsing and propositional meaning, and 2) *higher-level processing* involving inferencing, building a mental model, creating text-level and intertextual representations. Further, as noted in 2.3.3, these processes are described in terms of their constituents, i.e. processing sub-skills (see 2.3.2 & 2.3.3 for a detailed description of these processes).

Overall, the linguistics-literature corpus analysis reveals that those listening to these lectures from five courses in situ required 37 sub-skills, linked to seven cognitive processes (Chapter 2), which fall within higher- and lower-level processing stages. Also, some lecturers used one cognitive strategy (translation & transfer). However, the lecture transcript analyses mainly show higher-level and explicit lower-level processes due to the implicitness or difficulty in observing automated, lower-level processes, which are usually assumed to underlie higher-level processing.

Generally, the analyses show that some sub-skills prevail across linguistics-literature lectures, e.g. perceiving prominence, resolving anaphors, connecting utterances using conjunctions, distinguishing main points and details, considering redundancy and decoding students' speech. Some are more apparent in literature classes, e.g. connecting to textbooks, preparatory reading and recognising proper nouns, whereas others are more apparent in linguistics classes, e.g. exemplification. Sub-skills that occur less frequently include metaphor comprehension and voice inferring. Furthermore, more sub-skills are found to be associated with the two higher-level processes: building a mental model and creating intertextual representation, as opposed to making inferences.

Below, a more detailed presentation of these results is provided, namely an explanation of these cognitive demands, along with quotations demonstrating them at work during lectures, and the numbers of their occurrences. (In the tables, numbers in black are raw frequencies for the occurrence of particular sub-skills in lectures. The data in blue represent the numbers of occurrences of these sub-skills per 1,000 words

of lecture transcript (frequency of occurrence/total number of lecture transcript words)*1000.

4.4.2.1 Lower-level cognitive listening processes

The three processes carried out at this level include input decoding, lexical search and syntactic parsing. Each one is described below.

1. Input decoding

As shown in Table 4-6, this process includes, based on what has been found in this phase, five sub-skills: perceiving accenting, phoneme-decoding, decoding students' speech, recognising questions and voice inferring. Regular input decoding is expected to occur automatically whilst listening.

Table 4-6: Input decoding sub-skills

Process	Sub-skill	Frequencies (percentages)				
		Techniques	19-c. Lit.	Poetry	Socio.	Brit. Lit.
Input decoding	Paying attention to accented words or phrases in the speaker's speech	**W*=64** 11.26 **Ph.*=73** 12.84	**W=83** 16.38 **Ph.=82** 16.18	**W=117** 22.38 **Ph.=107** 20.47	**W=66** 19.82 **Ph.=33** 9.91	**W=100** 30.33 **Ph.=18** 5.46
	Paying attention to specific articulated phonemes				**1** 0.30	
	Using general pitch movements to distinguish between rhetorical Qs and Qs which need responses	**R**=10** 1.75 **Q**=62** 10.90	**R=11** 2.17 **Q=77** 15.19	**R=21** 4.15 **Q=69** 13.64	**R=11** 3.36 **Q=38** 11.61	**R=2** .56 **Q=1** .28
	Using a high-pitched tone sentence as a question	**4** 0.70	**14** 2.76	**37** 7.31	**8** 2.44	
	Decoding students' speech/voices	**122** 21.46	**133** 26.25	**159** 31.44	**109** 33.31	**17** 4.83
	Inferring from voice tone	**1** 0.17		**1** .19	**6** 1.83	

W=word, Ph.=Phrase, **R=Rhetorical question, Q=Question and LT=Lecturer's turn

a. Perceiving accenting

According to Arnold (2013), the prosodic prominence of words changes during speech. Prosodic prominence means that some words are pronounced with emphasis (with a pitch accent) whilst others are unaccented/reduced in emphasis. Such prosodic marking may affect processing. One of the functions of prosody can be to signal to the listener information about the speaker's intended message. Acoustic information can also help to identify the 'informational status' of content in speech, i.e. accented words usually convey new information, whereas unaccented words may refer to given (old), predictable or accessible information (Arnold, 2013). An example from the lecture corpus is:

> ***Quote/4.3***
> 'Would you please open your books? The PRELUDE at the beginning just before the beginning of Book 1. Okay, last time we talked about this very short prelude.' (Lecture/2/*Middlemarch*)

In Quote 4.3, the word shown in capital letters indicates speaker emphasis. The second mention of 'prelude' is shorter, lower-pitched and less intelligible than the first one. In contrast, the first utterance of 'prelude' is longer and more prominent. Also, in the corpus, not only are words accented, but also phrases. During the same lecture, the speaker stated:

> ***Quote/4.4***
> 'We said that it [Prelude] foretells the CONTEMPORARY CHARACTER of THERESA the – or the IDEALISM OF THE MAIN CHARACTER the – the FEMALE PROTAGONIST here of the novel, DOROTHEA BROOKE.' (Lecture/2/*Middlemarch*)

The lecturer delivered these words in a high-pitched tone. This was the main topic of the lecture, so perhaps the speaker used this phonological cue to help the listeners distinguish this information from the rest and perceive it as a main topic and its importance to the overall meaning.

b. Phoneme decoding

Explicit examples of instances where phonemic decoding would explicitly be required are rare, as this is a more automatic process which is expected to be more implicit at

this level of study. However, one example of this is a question posed by the lecturer in the course of providing an example of minimal pairs:

> ***Quote/4.5***
> 'Same pronunciation except for one position like for example when you say had and hat, yes?' (Lecture/4/*Age-and-gender*)

c. Recognising questions

Questions are often deployed in lectures to define concepts and stimulate thought (Crawford-Camiciottoli, 2007). The listener is required to use their knowledge of general pitch movements in speech to distinguish how questions function in lectures (Field, 2008a). For example, interrogative questions (those that need an answer from someone other than the speaker) are usually used to check comprehension (Thompson, 1998) and to predict meaning (Smith, 1987); rhetorical questions (those answered by the speaker) are usually used to focus the audience's attention (Young, 1994). In total, there are 247 interrogative and 55 rhetorical questions in the corpus.

An example of a question signalled in the transcript with a question mark, concerning a task-based approach, is:

> ***Quote/4.6***
> 'What language skills are we working on?'
> *[After the student answered by saying the classroom was working on writing, the lecturer continued with]*
> 'Writing and reading so in class we did a lot of listening and speaking… .' (Lecture/1/*Task-based*)

One rhetorical question surfaced when the lecturer was discussing the novel *Pamela* by Samuel Richardson:

> ***Quote/4.7***
> 'So it became very popular in England, why? It's not because of the, you know, moral of the story. It's not because it was didactic, it's because of the treatment or how he treats the characters and the analysis of motives and feelings.' (Lecture/5/*Rise-of-the-novel*)

Sometimes, the lecturers also used sentences with rising intonation, indicating questions that require responses. Thus, students, as listeners, needed to use their knowledge of intonation patterns to infer that these were questions, rather than rely

upon their knowledge of the typical syntactic structure of interrogatives. An example is:

> ***Quote/4.8***
> 'We talked about turn-taking and interruption. We said there are two types of interruption. If you want to interrupt someone you could interrupt them? (Pause).' (Lecture/4/*Age-and-gender*)

d. Decoding students' speech

According to Field (2008a), 'the more voices there are […] the more difficult a listening task becomes' (p.159). Listeners do not only need to distinguish voices but also to form ideas about the voice characteristics of each speaker (speech rate, pitch-setting, loudness) (Field, 2008a). In this corpus, although most of the responses from students are short, except when reading a text aloud, students take many turns in speaking. Some lectures contain many student turns, others do not. For example, the *Nineteenth-century literature* lecture includes 133 student turns, whereas the *British-literature* lecture involves minimal student talk. Further, the students who took turns, as observed, were few, about ten different students, out of about 35, spoke in a lecture.

e. Voice inferring

Also noticed in the corpus, albeit rarely, is that listeners need to draw inferences from the speaker's tone. For example,

> ***Quote/4.9***
> 'So examples would be, I think, instead of, you know, think of the utterance, 'I think she's not telling the truth', or 'I think you're not telling the truth'. Compare it to 'you're not telling the truth', of course apart from the high-pitched voice. It's, it's a little, you know, harsher, right?' (Lecture/4/*Age-and-gender*)

In this extract, the lecturer explained the effect of hedging by giving examples. She said 'I think she's not telling the truth' in a softer tone so that the listeners could infer why 'I think' is used as a hedge, whereas she said, 'You're not telling the truth' in a more assertive, stronger tone to enable the listener to differentiate phonologically between the two examples.

2. Lexical search

Table 4-7 illustrates that the lexical-search process includes three sub-skills, as found in this corpus: retrieving a word's meaning, paying attention to specific information and processing metaphors. A regular lexical search is expected to occur automatically.

Table 4-7: Lexical search sub-skills

Process	Sub-skill	Frequencies (percentages)				
		Techniques	19-c. Lit.	Poetry	Socio.	Brit. Lit.
Lexical search	Retrieving a word's meaning			**8** 1.58	**5** 1.52	
	Drawing attention to English names, places, dates, numbers and titles of books or novels	**7** 1.23	**20** 3.94	**31** 6.13		**51** 14.51
	Comprehending metaphors	**1** 0.17				

a. Retrieving a word's meaning

In this corpus, two lecturers sometimes asked about words' meanings during a lecture to check the listener's vocabulary knowledge, which is expected to allow them to follow the discussion. An example is:

> ***Quote/4.10***
> 'Now Harlem is this city in New York where the civil rights movement began, okay. That means that the African-Americans were involved in a struggle, in a fight, okay, for freedom, for equality. You know what equality is? To be equal with the whites.' (Lecture/3/*Harlem*)

In this quotation, the word 'equality' was key to the meaning of the lecture, and listeners needed to know that word for comprehension.

b. Recognising specific information

It was found, especially during literature lectures, that many Western proper nouns, places, novel or poem titles are mentioned. The listener, therefore, needs to recognise these names, particularly given that speakers do not often provide much context (i.e. note that a given noun represents an English name or novel title); the mention of these names and titles often comes naturally. Most of the names mentioned in this TLU situation would typically constitute culturally unfamiliar lexis to this particular

audience. Nevertheless, processing proper nouns is particularly important while listening. Some empirical evidence suggests that L2 learners generally struggle with understanding proper nouns (Sasaki, 2000). Further, Valentine, Brennen and Bredart (1996) point out that proper names are difficult to remember because the listener does not have alternative similar sounding words to refer to in their lexicon, especially in the case when a lecturer assumes that their listeners will retrieve these proper nouns from long-term memory.

The linguistics-literature corpus includes such names as *Martin Luther King Jr.* and his famous speech *I Have a Dream, The Eagle* by *Lord Tennyson* and the name of the well-known twentieth-century American poet *E.E. Cummings* surface in the *Poetry* class. Names of such novels as *Clarissa, Eloisa to Abelard, Adventures of Joseph Andrews, Virtue Rewarded* and *The Adventures of Robinson Crusoe* surface in the *British-literature* class.

c. Processing metaphors

Carroll (2008) hypothesises that it takes longer to understand metaphors than literal statements. Carroll (2008) adds that some research shows that processing figurative language may involve two stages: (1) recognising that a sentence is literally untrue and rejecting it; (2) detecting implicit similarities between possible metaphorical meanings and the speaker's intended meaning. Meanwhile, other research shows that metaphors can be understood directly, rather than needing to comprehend the literal meaning first (Carroll, 2008). One metaphorical statement is found:

> ***Quote/4.11***
> 'Of course in all cases my ultimate goal is to teach English but here I'm not, I don't get into the class and I tell them I'm teaching you English. I tell them that there is a task that you're going to complete and you will not succeed in this task unless you use English. It's like I'm telling them there is a river and you cannot cross the river – what is the aim? It's to cross the river. It's not to swim or whichever. But you cannot cross the river unless you take this boat. This boat is English.' (Lecture/1/*Task-based*)

3. Syntactic parsing and propositional meaning

Here, this process includes dealing with incomplete utterances as well as processing students' responses containing incorrect grammar (Table 4-8). Regular syntactic parsing and establishing a propositional meaning are assumed to be largely automatic.

Table 4-8: Parsing sub-skills

Process	Sub-skills	Frequency (percentage)				
		Techniques	19-c. Lit.	Poetry	Socio.	Brit. Lit.
Parsing	Dealing with incomplete utterances	**4** 0.70	**1** 0.19	**4** 0.79	**8** 2.44	**3** 0.85
	Comprehending students' speech despite incorrect grammar	**12** 2.11	**5** 0.98	**2** 0.39	**7** 2.13	**1** 0.28

a. Dealing with incomplete utterances

In spoken discourse, and sometimes in this corpus, some utterances are left abandoned/unfinished by the speaker (who moves on too quickly to talk about another point). One example is:

> ***Quote/4.12***
> 'The linguistic choices we make, right? So one can choose to speak either when it comes to- and we said that there was a difference between sex and gender, what is that?'(Lecture/4/*Age-and-gender*)

The listener in this case is expected to predict the unfinished utterance using text, prior knowledge or co-text (Goh, 2000).

b. Processing students' grammatically incorrect utterances

Given that this is an L2 context, there were some students who spoke grammatically incorrect utterances when interacting with the lecturer. The following example displays such an issue.

> ***Quote/4.13***
> Lecturer – 'So what's the difference between second and foreign language?'
> Student – 'Foreign language it's the language from the country itself. The second language is no foreign language is the language that he uses when he travel.' (Lecture/1/*Task-based*)

During a lecture, listeners must comprehend each other (even in cases where speech is grammatically incorrect) to know what content/information is being conveyed. Field (2008a) refers to the issue of 'normalisation' in which listeners need to 'edit out' features in speakers' speech in terms of quality (incorrect grammar could be one) to arrive at an understandable form of what has been said (p.158).

4.4.2.2 Higher-level cognitive listening processes

Higher-level listening processing involves four processes: inferencing, building a mental model, creating a text-level representation and creating intertextual representation. Each one is described below.

1. Inferencing

Regarding inferencing, Table 4-9 shows that listeners may need to bring into play different types of knowledge: world, pragmatic or topic knowledge, which enable them to go beyond explicitly stated information and infer the implicit meanings of propositions. These include:

Table 4-9: Inferencing sub-skills

Process	Sub-skill	Frequency (percentage)				
		Techniques	19-c. lit.	Poetry	Socio.	Brit. lit.
Inferencing	Recognising a speaker's illocutionary intention/ultimate goal (explicit/implicit)	**5** 0.87	**3** 0.59	**1** .19	**2** 0.61	**2** .56
	Adding information from the real world to the literal meaning	**9** 1.58	**7** 1.38	**27** 5.34	**29** 8.86	**18** 5.12
	Recalling information from the same lecture to comprehend another relevant point	**6** 1.05	**6** 1.18	**9** 1.78	**3** 0.91	**10** 2.84
	Comprehending that a student's answer is wrong from the instructor's speech	**22** 3.87	**15** 2.96	**9** 1.78	**8** 2.44	

a. Recognising a speaker's intention

Some utterances convey information, whereas others convey the speaker's attitude towards the listener or the content (Carroll, 2008). For instance, if a lecturer says that s/he brought up a certain item in a past exam, one can understand that the speaker

might have mentioned this to imply that s/he might bring up the same or a similar item in the exam this year, and therefore wants students to focus on it. This can be seen in this utterance:

Quote/4.14
'Now in the exam, we have a question that says: what is the method that focuses on everyday life, and you have these options [Task-based, ALM, CLT]. How do I differentiate between these on the one hand and this on the other hand?' (Lecture/1/*Task-based*)

Additionally, the listener sometimes needs to recognise that a student's response is wrong. Not all students always say the correct thing, and lecturers do not always reject answers. However, one can infer from the way the lecturer replies that an answer is unacceptable, as displayed in this interaction:

Quote/4.15
Lecturer: 'Okay, they are Theresas, yet they did not have epic lives, so this means what?'
Student: 'They have the same name.'
Lecturer: 'Do they have the same name?'
Student: 'Yes.'
Lecturer: 'Is this the point here, having the same name?'
Student: 'Same character, same passions!'
Lecturer: 'Yes. Yes, they were not able to … Yes, realise their own dreams… .' (Lecture/2/*Middlemarch*)

b. Adding world knowledge to literal meaning

Individuals have considerable stored knowledge about the world (outside discipline-specific knowledge) that they rely upon to comprehend large parts of what they hear (Buck, 1995). For example, knowledge about movies in the world was brought up in the *British-literature* lecture:

Quote/4.16
'So imagine you're you know you're watching a movie, and you see that, you know, a character is sad for example. One of the actors is sad you'll only see that, you'll not get a description of it and so you have to understand that the character is sad and, you know, compare it to a character in a novel who is describing vividly how he feels and you know what is causing him to be sad. And so I think with a book, with a description with words it's going to give you more in-depth analysis of the of the character.' (Lecture/5/*Rise-of-the-novel*)

c. Adding information recalled from the same text

Speakers sometimes require the listener to recall something that has been said earlier (in the same lecture) to help them comprehend a new point. An example is:

> ***Quote/4.17***
> 'So the child-pilgrimage because, you know, Saint Theresa at that time, along with her- or together with her brother were children, okay. They were very, very, very young… .' (Lecture/2/*Middlemarch*)

While discussing Saint Theresa's life as a child, the lecturer used 'you know' to refer to information already given earlier in the lecture. The listener was expected to refer to topic knowledge presented earlier to understand a point being heard currently.

2. Building a mental model

As shown in Table 4-10, building a mental model process involves: identifying the topic, key points, details and peripheral information, using redundancy, resolving anaphors, using conjunctions to connect two utterances and recognising when a speaker indicates new points, evaluates information or gives examples. It should be noted that many of the sub-processes described in this section refer to what lecturers do when speaking. While lecturing to their students, lecturers are generally, as Thompson (1994) mentions, aware of the need for a listener to set up a framework for the oral lecture. Often a lecture structure is laid out in lecturers' words in order to help listeners and give them a context to process new information. Thus, a lecturer may use strategies in their speech/ texts, such as indicating new points or giving examples while they are presenting new information or content. However, this then becomes the listener's cognitive need and thereby the listener must create meaning by exploiting linguistic devices, whether they are implicitly inferred or explicitly mentioned by the lecturer, to help the listener extracts important information from texts or the described events.

Table 4-10: Building a mental model sub-skills

Process	Sub-skill	Frequencies (percentages)				
		Techniques	19-c. lit.	Poetry	Socio	Brit. lit.
Building a mental model	Identifying the lecture's title	**1** 0.17	**1** 0.19	**2** 0.39	**1** 0.30	**1** 0.28
	Identifying the central idea in the lecture without explicitly pointing it out	**1** 0.17	**5** 0.98	**15** 2.96	**6** 1.83	**15** 4.26
	Identifying supporting ideas under the central one	**16** 2.81	**18** 3.55	**53** 10.48	**51** 15.58	**63** 17.92
	Identifying peripheral information unrelated to the topic without a lecturer pointing it out	**2** 0.35	**5** 0.98	**1** 0.19	**2** 0.61	**1** 0.28
	Considering redundancy in terms of exact repetition	**25** 4.39	**24** 4.73	**23** 4.54	**12** 3.66	**5** 1.42
	Considering redundancy in terms of synonym use	**22** 3.87	**30** 5.92	**15** 2.96	**13** 3.97	**22** 6.26
	Considering redundancy in terms of paraphrasing	**18** 3.16	**29** 5.72	**24** 4.74	**25** 7.64	**9** 2.56
	Considering redundancy in terms of glossing	**8** 1.40	**14** 2.76	**20** 3.95	**11** 3.36	**8** 2.27
	Integrating/connecting an incoming piece of information and information immediately preceding it	**440** 77.42	**355** 70.07	**423** 83.66	**238** 72.73	**366** 104.15
	Resolving anaphors	**925** 162.76	**793** 156.53	**867** 171.47	**449** 137.22	**572** 162.77
	Recognising when the speaker indicates new points	**3** 0.52	**10** 1.97	**24** 4.74	**11** 3.36	**7** 1.99
	Recognising when the speaker evaluates information before or after transmitting it	**4** 0.70		**4** 0.79		**11** 3.13
	Recognising when the speaker illustrates theoretical concepts by giving familiar examples	**13** 2.28	**2** 0.39	**5** 0.98	**21** 6.41	**6** 1.70

a. Identifying the lecture's title

It was found that lecturers first identify the topic/title at the outset, and some did so in an explicit way, as in this example:

> ***Quote/4.18***
> 'So today we're going to continue talking about the 18th century, especially the second half of the 18th century, and we are going to focus on prose writing, and we're going to specifically talk about the rise of the novel. We already talked about it briefly with Defoe last time but it is really with Richardson and Fielding that we see … the form of the novel developing into its modern form.' (Lecture/5/*Rise-of-the-novel*)

Others began in an implicit way by talking about the previous class's 'age and gender', and the listener in this case needed to understand that the speaker would continue discussing the same subject in the rest of the lecture, as in this utterance:

Quote/4.19
Lecturer: 'Okay, so the last time we actually started talking about?
Students: 'Age and gender.'
Lecturer: 'So we talked about age and gender and we said that… .' (Lecture/4/*Age-and-gender*)

b. Identifying key points, supporting details and peripheral information

The transcripts are also found to have key points and supporting ideas. For example, Figure 4-9 shows two key points: the concepts of hedging and giving compliments based on their use according to gender in the *Sociolinguistics* lecture, and the different supporting details and sub-details that come after them. (The figure below is made on the basis of the lecture and it is not a quote).

Hedges — A key point

- Examples of hedges are given: = Softeners // I think, I guess, you know, maybe, sort of, somewhat... etc *(detail)*
- The effect of the use of hedges; they are not assertive, the effect is to soften… *(detail)*
- Who uses hedges more? *(detail)*
1. Women — *(sub-detail)*
2. Why? — *(sub-detail)*
3. Example — *(sub-detail)*
- Definition — A word or a clause that is meant to lessen the effect of the impact of an utterance. *(detail)*
- Explanation of the definition .. a word or a phrase that is meant to lesson… — *(detail)*
- The use of hedges in general among males and females (no clear-cut distinctions) — *(detail)*
- Example of the use of hedges; I think she's not telling the truth - you're telling the truth — *(detail)*
- Why women uses them more? — *(detail)*
1. Women care more about pursuing a style of interaction based on mutual agreement and support. 'Mutual agreement' — *(sub-detail)*
2. Example — *(sub-detail)*

Giving compliments — a key point

- What is a compliment? — *(detail)*
- Definition: A polite expression of praise or admiration — *(detail)*
- Compliments fall under positive politeness strategies which are directed at: — *(detail)*
1. Approving of the listener's appearance -- (e.g. "I like your hair today!", ability e.g. "excellent shot!", possession e.g. "Nice car!". – *(sub-detail)*
2. Stressing friendliness and the desire of being treated as a member of a group rather than as a single individual. – *(sub-detail)*.
- Who gives more compliments? — *(detail)*
1. Compliments are given amongst people who know each other well — *(sub-detail)*
2. Women usually give more compliments and example — *(sub-detail)*
- Compliments can have different functions: They can express: — *(detail)*
1. Solidarity and example — *(sub-detail)*
2. Admiration and example — *(sub-detail)*
3. Envy and example — *(sub-detail)*
4. Harassment and example — *(sub-detail)*

Figure 4-9: Key points and details in part of the Sociolinguistics lecture (Written as a memo in Atlas.ti)

In this case, the listener is expected to identify these key points and details, relate different points together and differentiate between these points while attempting to build a macrostructure of the lecture.

Further, lecturers sometimes mentioned irrelevant information to the topic and perhaps unimportant, but it is nevertheless brought up. The listener needs to recognise that such peripheral points are not ones to focus on or keep in WM. An example is when, in Lecture 4, the lecturer mistakenly says 'minimal pairs' instead of 'minimal responses'. She then decided to ask about minimal pairs, which the listener needed to realise is unrelated to the current lecture.

c. Using redundancy

Redundancy refers to the repetition of ideas or words already expressed in an oral passage through reiteration (Field, 2008a) or tautology (Ur, 1984). Influence of redundancy on L2 comprehension originated in SLA research, particularly Krashen's (1980) input hypothesis. To be assimilated, language must be made comprehensible through methods such as input modification; otherwise, L2 learners might not understand (Chaudron, 1983). Semantic/lexical modification can be done in various ways, differing in their 'linguistic complexity' and 'psychological salience' (Chaudron, 1983, p.441).

In this corpus, lecturers seem to be aware of the complex nature of the content being delivered and/or the linguistic obstacles of their listeners. Thus, speakers made use of redundancy (n=357) in terms of exact repetition, synonyms, gloss and paraphrasing to make lectures more accessible. Examples include:

Quote/4.20
'It's called alliteration. When you have a repetition of the first consonant sounds, okay, of a word, you remember? Dreams and deferred. Okay, so it's the repetition of the first consonant sound' (**Exact repetition** – Lecture/3/*Harlem*)

Quote/4.21
'Two of his friends, who were publishers, asked him to prepare for them a little volume of letters in a common style … who were unable to indite for themselves. So they wanted him to write letters' (**Synonym** – Lecture/5/*Rise-of-the-novel*)

Quote/4.22
'So he took the advantage of the popularity of Pamela, and make [made] a joke out of it, by turning it into burlesque. And burlesque … is a form of writing where you mock a work or you make fun of it or turn it into comedy.' (**Gloss** – Lecture/5/*Rise-of-the-novel*)

Quote/4.23
'How does it make you feel, I mean psychologically? Does it make you- what kind of mood does it put you in?'(**Paraphrasing** – Lecture/3/*Harlem*)

d. Connecting an incoming piece of information with information preceding it using explicit conjunctions

Connecting utterances using a conjunction is critical to text comprehension (Zwaan & Rapp, 2006). According to Halliday and Hasan (1976), conjunctive elements can take various forms (additive, adversative, causal, temporal, continuative). Based on Halliday and Hasan's (1976) list of conjunctions (Appendix H), the most common type of conjunction in this corpus is 'and', which is also considered to be the simplest type of conjunction (Halliday & Hasan, 1976). 'And' occurs 500 times and is commonly used to connect one sentence to another, thus unifying two or more short statements (Halliday & Hasan, 1976). This is illustrated in Figure 4-10.

Figure 4-10: Dispersion plot of *'and'*

e. Resolving anaphors

Similarly, Zwaan and Rapp (2006) state that processing anaphors is critical when comprehending connected discourse, as it promotes the creation of a coherent mental representation. According to Halliday and Hasan (1976), there are different types of references (personal, demonstrative, comparative). In this corpus, the definite article 'the' occurs most often among all types of references, based on Halliday and Hasan's

(1976) cross-referencing list (Appendix H). The frequency of 'the' in all five lectures is 1,097. This is illustrated in Figure 4-11, below. Upon hearing 'the', the listener is expected to hold the antecedent in their WM long enough to search for an appropriate referent (anaphor), whereas the indefinite article, i.e. 'a' or 'an', is typically used to introduce a new entity (Zwaan & Rapp, 2006). Carroll (2008) hypothesises that the distance between antecedents and anaphors is a sensitive issue while listening. If it is too long, this might impose a considerable burden upon WM, which might ultimately result in disrupting understanding.

Figure 4-11: Dispersion plot of *the*

f. Recognising when a speaker indicates new points

The listener needs to recognise that the speaker is announcing a new direction whilst lecturing, the sub-skills (f, g, h) are based on Young's (1994) model. The component of hierarchical structure in Field (2013) and Khalifa and Weir (2009) overlaps with some aspects of Young (1994). While Field (2013) and Khalifa and Weir (2009) focus more on a global level (i.e. identifying central, supporting and peripheral ideas), Young focuses more on the local features of lectures, advocating that the listener should be guided by the linguistic cues articulated by the speaker, since the lecture structure is usually conveyed by the speaker's words, so the listeners need to understand. For instance:

> ***Quote/4.24***
> 'Let's turn to Richardson who is, really the book describes him as our first novelist but, you know, again it's really hard to define the margins of when a novel was written.' (Lecture/5/*Rise-of-the-novel*)

The discourse marker (a phrase) 'let's turn to', at the beginning of the utterance, introduces a key point, and the listener is expected to use such an explicit marker to

recognise that the speaker is going to discuss a new idea and that the listener is expected to start thinking about this idea from now on.

g. Recognising when a speaker evaluates information

Sometimes, the speaker evaluates information covered in a lecture by indicating their personal agreement or disagreement with a notion, or by offering an opinion regarding the content (Young, 1994). For instance:

> ***Quote/4.25***
> 'When we study poetry, it's important for you to keep on this side the elements [writing on board] you're going to look for ... For example, you have word choice and word order … the voice … the tone … imagery … so all the time, when you're reading a poem, these are the things. You're going to do it step by step. Now it's difficult to extract all these meanings from a poem … So, it's difficult to extract all of these from the poem. So it's best to take it step by step… .' (Lecture/3/*Harlem*)

In this excerpt, the speaker evaluated a key issue to which the listener needs to pay attention by giving explicit judgements, using words such as 'important', 'difficult' and 'best'.

h. Recognising when a speaker uses examples

Lectures are often interspersed with examples to help simplify abstract points. In this corpus, particularly, the two linguistics lectures contain more examples than the literature ones. The frequency of using examples ranges from two times in the *Nineteenth-century* lecture to 21 times in the *Sociolinguistics* one. A lecturer sometimes indicated that they were going to give an example by using verbal cues, e.g. 'like', 'such as', 'for example' or 'for instance', or asking the listener to 'imagine'. One example is:

> ***Quote/4.26***
> 'I'll give you an example. I'm going to give them a task about movies and actors and I would put a group- a group of names of movies and a group of names of actors and actresses… .' (Lecture/1/*Task-based*)

3. Creating a text-level representation

According to the data in this phase, this process involves:

Table 4-11: Creating a text-level representation sub-skills

Sub-skill	Frequencies (percentages)				
	Techniques	19-c. lit.	Poetry	Socio	Brit. lit.
Reviewing flow of ideas for the whole text	**1**	**1**	**1**	**1**	**1**
Discovering similarities and differences between ideas	**1** 0.17		**10** 1.97	**6** 1.83	**8** 2.27
Recognising when the speaker summarises points made earlier	**5** 0.87	**4** 0.78	**5** 0.98	**3** 0.91	**4** 1.13

a. Reviewing flow of ideas for the whole text

Building a mental model process – described above – should lead to creating a hierarchy of propositions after the whole text is processed. For example, someone who has finished listening to a lecture from the *British survey* course is expected to end up with a discourse structure, as shown in Figure 4-12, in which the topic is identified and key points are listed, followed by details, and even by sub-details adding information to the details. (The following figure is made on the basis of the lecture, not a quote.)

The structure of the British survey class:

Topic: The rise of the novel during the second half of the 18th century (Richardson and Fielding) (Modern form of the novel)

1. An overview of the things taht have been covered so far in terms of prose — **key point**
A. A certain amount of prose fiction produced during the early modern period: Romantic, didactic, works show realism. — **detail**
B. First half of the 18th century: emphasis was on biographies and turning historical figures into fictitious narratives.— **detail**
Example: Defoe's works 'The Adventures of Robinson Crusoe' and ' Journal of the Plague Year' — **sub-detail**
Defoe rejected romance conventions, and adopted tone and actual biography, and came 'VERY NEAR' to the genuine novel. — **sub-detail**
Defoe is today classified under crime novels or adventure novels — **sub-detail**
2. The book intends that, no one, not even Defoe, had yet written a novel of contemporary, socail, domestic life. — **key point**
3. A novel produced by Richardson 'Pamela' reflects ordinary people in a familair setting. — **key point**
4. The actual beginnings of the novel in England — **key point**
A. it's firm establishment and popularity from second half of the 18th century - 'SO REALLY with' Richardson - 'The greatest achievement of that age'. — **detail**
4. The popularity of the novel — **key point**
A. Dependent upon the grwoth of a varied reading public — **detail**
B. With Richardson that prose fiction passed in its modern form — literature then begins to outgrow the limitations of classicism — **detail**
- Classic school (rigid, certain rules to follow) — **sub-detail**
- Examples: A pastoral poem (had a certain form) — **sub-detail**
Pope (description of nature is copied from the Greek and Latin writers, instead of him describing the nature of his country) — **sub-detail**
5. The novel gave writers 'freedom' to write without the limitations of the classic school. — **key point**
A. In the epic and drama it was impossible that writers reject the authority of antiquity but with the novel that authority can be ignored — **sub-detail**
6. The rise of the novel was really a result of the democratic movement in the 18th century. — **key point**
A. Works of art or literature reflect the historical, social and political aspects of life (A factor) - **detail**
- The democratic movement in England and Europe (people become aware of the ideas of liberty, freedom, and importance of every individual) — **sub-detail**
7. The comprehensiveness of the novel — **key point**
A. includes ordinary people in familair setiings — **detail**
b. free treatment of the characters and conditions (sympathetic handling of middle and low life = democratic quality) — **detail**
8. Novel is significant — **key point**
A. because it is not like the previous period (the age of Pope) that deals with important figures (the upper class of society) — **detail**
- so novel appeared at a time when middle classes were gaining social and political power — **sub-detail**
9. The form of the novel gives a wider scope than is allowed by the drama for the treatment of motives, feelings, and inner life. — **key point**
- Drama: is presented at a theatre, time is limited, cannot go into much depth, presented in from of audience — **detail**
Soliloquy — **sub-detail**
- Novel: The narrator is going to describe everything and anything that happends inside or outside of a character — **detail**
10. Richardson —> first novelist — **key point**
- hard to define the margins of when a novel was written — **detail**
- Defoe and Swift are considered novelists — **detail**
11. How Richardson wrote his novel Pamela — key point
A. Two publishers asked him to prepare a little volume of letters — **detail**

Figure 4-12: A text-level representation for the beginning of the British-survey lecture

b. Understanding similarities and differences

Based on most of these lectures, a listener is also expected to understand how the different pieces of information presented by the speaker are similar and dissimilar to each other. For example:

> ***Quote/4.27***
> 'And so if we look at his work we see that Fielding was much concerned about the structural principles of prose writing. A matter to which neither Defoe nor Richardson had given much attention, so he's really or he was really preoccupied with the novel as a literary genre and the principles that govern it. To him the novel was quite as much a form of art as the epic or the drama, he was a social satirist and a moralist as well, and so both Richardson and Fielding are moralists but in different ways.' (Lecture/5/*Rise-of-the-novel*)

Here, the listener has to identify this point presented by the lecturer, clarifying how the style of the actual created text (novel) differs between Fielding and other authors of his time, such as Defoe and Richardson.

c. Recognising when a speaker summarises points made earlier

The speaker sometimes summarises points after giving an explanation, to ensure that the listener understands the most important concepts (Young, 1994). For example, the *Nineteenth-century* course instructor, after a long explanation, said:

> ***Quote/4.28***
> 'So this is, briefly speaking, the character of Dorothea, and very briefly, her story. This is her story. Okay, she is the Saint Theresa of her society, of Middlemarch. She is the do-gooder of her society. She has plans and, you know, she has schemes... .' (Lecture/2/*Middlemarch*)

To conclude a point, the lecturer may also ask a student to read a PowerPoint slide after explaining a concept, as in this example:

> ***Quote/4.29***
> 'So this is what hedges are. Who's going to read the definition? [from a PowerPoint slide] Yes, Okay.' (Lecture/4/*Age-and-gender*)

4. Creating an intertextual representation

As explained earlier, processes and sub-skills – discussed above – concern processing information provided in the *same* text, whereas creating intertextual representation concerns processing information from *multiple* texts/modals from outside and/or within the lecture. As Table 4-12 shows, some additional activities can occur in parallel to listening in academic settings.

Table 4-12: Creating intertextual representation sub-kills

Sub-skill	Frequencies (percentages)				
	Techniques	19-c. lit.	Poetry	Socio.	Brit. lit.
Connect to a previous lecture: revision of existing rather than new knowledge	**5** 0.87	**1** 0.19	**11** 2.17	**4** 1.22	**15** 4.26
Recall (preparatory) reading(s)		**1** 0.19			
Connect to clues given on the blackboard	**8** 1.40		**33** 6.52		
Connect to information given in PowerPoint slides				**11** 3.36	
Connect to information in a textbook	**10** 1.75	**15** 2.96	**48** 9.49		
Constructing meaning from different speakers	***LT= 121** 21.29	**LT= 139** 27.43	**LT= 191** 37.77	**LT= 109** 33.31	**LT= 17** 4.83

*Lecturer-turn

According to what has been found in this phase, these may include connecting to information given in:

a. Previous lectures

As seen in all the lecture transcripts, the listener might need to recall information provided in previous classes (existing knowledge) to process new expository discourse. In this corpus, this is usually expressed through the use of words such as 'remember', 'we said', 'we talked', 'I told you' or 'last time'. For instance:

> ***Quote/4.30***
> 'Now let's look at the images. Let's look at the images here. Okay, remember, the images appeal to your five senses… .' (Lecture/3/*Harlem*)

b. Preparatory reading

Professors might ask students to do preparatory reading before class, particularly for literature lectures. In this case, the listener is expected to engage in lecturer talk (and possibly student talk) related to what they read before listening, thereby combining what they hear with their recollection of their reading. For example, the *Nineteenth-century* class lecturer asked the students to read some chapters from the *Middlemarch* novel:

> ***Quote/4.31***
> 'Have you read, did you read the first six chapters? ... What do you find in these six very- the beginning, at the beginning? Let's say chapter one, deals with what?' (Lecture/2/*Middlemarch*)

c. Words written on the whiteboard

Two lecturers, from the *Techniques* and *Poetry* classes, simultaneously wrote keywords on the board whilst talking. The poetry instructor, for example, wrote the following underlined words.

> ***Quote/4.32***
> 'For example, you have word choice and word order. You have the voice or on the- in other words, the speaker. The speaker has the tone, okay. And the way he speaks gives you the mood. Okay? You have to look for imagery. You have to look for figures of speech… .' (Lecture/3/*Harlem*)

d. PowerPoint slides

As observed, PowerPoint slides were used in two lectures. The *British-literature* instructor did not explicitly point to the slides, whereas the *Sociolinguistics* instructor often referred to them. For instance, the underlined words (in the extract below) appeared on the screen and the listener had to engage with them while the instructor explained the definition of minimal responses.

> ***Quote/4.33***
> Lecturer: 'Okay, so let's take it one by one. They are monosyllabic, monosyllabic. What does mono mean?'
> Student(s): 'One.'
> Lecturer: 'One. Syllabic, what is syllabic? Taken from syllable … One syllable, okay. Utterances, this means something that is actually said by a person, it's uttered … examples [are] yeah and huh or uhuh, associated with cooperative language use.' (Lecture/4/*Age-and-gender*)

e. A textbook

As observed, textbooks were used in four of the lectures so that students could follow the discussion. Listeners needed to combine what they were listening to with what they read or was being read by a student or lecturer from their textbook simultaneously. Examples are:

> ***Quote/4.34***
> 'Let's reread one, two, three, four, five, starting from the sixth line again. Okay, the fifth, so the little girl walking forth one morning hand-in-hand with her, yes, still smaller brother to go and seek martyrdom.' (Lecture/2/*Middlemarch*)

> ***Quote/4.35***
> 'How was the rhyme scheme? How did it progress? For the first three lines, the first stanza, it was what?' (Lecture/3/*Harlem*)

Thus, lecture content presented in writing (particularly vis-à-vis (c), (d) and (e), above), knowledge of 'sound–spelling matching', frequently needed in academic settings, is critical as Field (2008a, p.170) indicates. According to Field (2008a), the listener needs to connect the sound of a word produced in speech to the series of letters that represents that word's written form. This process is likely to help listeners fix a mental, written representation of the word in memory, since the phonological form of a word seems to be unreliable for some L2 learners, especially unfamiliar

words (Field, 2008a). In such a language event, the visual representation is often limited to a word or a few words, and the contextualisation or broader meaning resides in what the lecturer articulates, such that, with only the written text, the listener would not understand.

f. Constructing meaning from different speakers

Dialogic episodes (between instructor and students) are often deployed in lectures to facilitate understanding (Crawford-Camiciottoli, 2007). Interactive dialogue can be seen in all of the lectures in this corpus, ranging from 17 turns in the *British-Literature* lecture to 191 turns in the *Poetry* one. In fact, with the exception of the *British-literature* lecture, all lectures can be considered 'highly interactive', based on Csomay's (2002) classification of more than 25 episodes of verbal exchange between lecturers and students. As observed, the *British-literature* instructor holds the floor mostly uninterrupted, perhaps because it was given to a large class. Lecturers generally initiated contact by asking the whole class or individual students questions, perhaps to improve their understanding. An example is:

> ***Quote/4.36***
> Lecturer: 'Do you think it's an applicable method? [Task-based]… .'
> Student: 'Yes.'
> Lecturer: 'Yes? So you're the teacher and tomorrow you have a class in the task-based method. What task are you going to give your students?'
> Student: 'Make them do the timetable.'
> Lecturer: 'What? Another task. Timetable is just an example [this was given earlier by the instructor]. Create another task … Timetable is a kind of task ... Content-based was about geography. It's just an example. It can be physics, it can be mathematics, it can be history, whatever. So timetable is just a kind of task the teacher created in order for the students to interact. Think of another task!' (Lecture/1/*Task-based*)

Although these were short comments, students sometimes asked for clarification/questions or contributed to the lecture. For instance, one student asked the lecturer:

> ***Quote/4.37***
> Student: 'Now we have a movie for the same story but without a book. Is it the same story that we- in the book that we have! Some parts explain more, explained more in the book, so, but of the same events?'
> Lecturer: 'I think that's up for debate depending on how you look at it… .' (Lecture/5/*Rise-of-the-novel*)

4.4.2.3 Cognitive strategies

Finally, it is noticed that the lecturers, albeit rarely, used one cognitive strategy, i.e. using L1 in two ways: transfer and translation (Table 4-13). Based on Vygotsky's sociocultural theory, using L1 in an L2 class is thought to be a valuable cognitive tool to 'scaffold' students' learning (Anton & DiCamilla, 1998).

Table 4-13: Cognitive strategy

Strategy	Frequencies (percentages)				
	Techniques	19-c. lit.	Poetry	Socio.	Brit. lit.
Relating a word mentioned in L1 to ongoing speech	**5** **0.87**	**1** **0.19**		**5** **1.52**	
Explicitly transferring a similar idea in L1 to L2				**3** **.91**	

a. Transfer

O'Malley and Chamot (1990) define the transfer of knowledge from L1 to L2 as 'the use of previous linguistic or prior skills to assist comprehension or production' (p.120). For instance:

> ***Quote/4.38***
> 'It's grammatical gender, like for example, the door and the table in Arabic 'Tawlah and Bab'. What makes the door in Arabic masculine? Is there something about the door that makes it masculine? Does it have a moustache, for example? No. So it's actually only for the reasons of grammar, whereas when it comes to the table it's the same, but when it comes to 'Rajol Emra'ah', yes, it's biological. There is something about the anatomy or the biology of this that gives the gender.' (Lecture/4/*Age-and-gender*)

In this example, the lecturer used the Arabic words 'Tawlah' and 'bab' as examples to explain the definition of grammatical gender in English.

b. Translation

Some lecturers translated single words from English into Arabic to verify if the listener understands their meanings, for example:

Quote/4.39
Lecturer: 'Do you know what harassment is?
Student(s): 'It's the opposite of a compliment.'
Lecturer: 'I have to say it in Arabic, Taharosh.' (Lecture/4/*Age-and-gender*)

4.5 Summary

The phase 1 analyses took an in-depth look at the spoken language corpus as a starting point to gain a first impression of the TLU. From the five lectures gathered for this study's TLU situation, the first type of analysis conducted, corpus-based analysis, showed that ELL listeners are expected to process lengthy aural texts that seem to be linguistically complex because they contain technical vocabulary, low- and mid-frequency words, and complex grammatical structures; they are also information-dense. The second type of analysis, discourse analysis, revealed a total of 37 sub-skills to be linked to seven processes (input decoding, lexical search, parsing, inferencing, building a mental model, creating text-level and intertextual representations) needed to process the five lectures, as well as one cognitive strategy (translation and transfer) used by lecturers themselves. However, the discourse analysis indicated only explicit lower-level sub-skills that can be seen in the data. Thus, this analysis emphasised numerous complex higher-level sub-skills that listeners in this situation are expected to activate. Examples are recalling information perceived and understood already in the same text to understand another piece of information being said now, linking what is heard to world knowledge, and recognising different spoken pieces of information in the text (main points, details) at a local level and integrating these at a global level to gain an in-depth understanding of the lecture.

The next chapter (5) covers Phase 2, whose input materials for the stimulated-recalls are taken from the corpus developed during Phase 1. Phase 2 focuses on real-time processing problems.

Chapter 5 Stimulated recall analyses (Phase 2)

5.1 Introduction

This chapter presents the stimulated recall findings, Phase 2, of the current study. In this phase, I explore 'real-time processing problems' that prevent participants from achieving complete and accurate comprehension during listening to audio-recorded real-world lectures, i.e. students' present listening needs. According to Goh (2000), the term 'real-time processing problems' refers to what a participant does incorrectly and/or fails to do in trying to understand oral material, problems that can then be associated with the cognitive operations occurring at the different stages of comprehension (p.56). This is done to answer *RQ1c*: 'What real-time processing problems do ELL undergraduates experience when listening to lectures in the ELL programme?'

Section 5.2 describes Phase 2's methodology, and Section 5.3 the findings. Finally, the chapter is summarised in 5.4.

5.2 Data collection and analysis

5.2.1 Conducting stimulated recalls

In order to investigate processing problems when listening to lectures, this study employs verbal protocols (i.e. stimulated recalls). Kasper (1998) defines verbal protocols as 'oral records of thoughts, provided by subjects when thinking aloud during or immediately after completing a task' (p.358). Based on information-processing theory, Ericsson and Simon (1993) contend that verbal reports are of significant benefit in the study of cognitive processes, as they can provide vital data about past experiences, as well as retrieve knowledge that may not be easily accessed by other traditional observations. According to Ericsson and Simon, there are two forms of verbal reporting. A concurrent verbal report, or a talk-aloud or think-aloud report, involves asking a participant to directly verbalise information during cognitive processing while performing a task, while in retrospective reports, participants

immediately recall mental processes they have just finished, with the expectation that certain retrieval cues may remain in short-term memory. Ericsson and Simon warn that the longer the interval between cognitive processing and retrospective reporting, the more difficult and incomplete recall will be. Gass and Mackey (2000) therefore recommend that researchers use stimuli to help participants recall their thoughts, which can be accomplished by inviting participants to watch a video, listen to an audio recording, look at a piece of writing they have just finished or, as Ren (2013) and Goh and Taib (2006) did, answer specific questions that encourage participants to verbalise how well they felt they performed a task.

With listening understood as a 'covert activity' (Laviosa, 2000), a large body of research has developed that uses different kinds of verbal protocols to investigate the cognitive behaviours of L2 listeners and how aural language is processed. This research has collected useful data on processes, sources of knowledge, strategies and problems related to listening (e.g. Goh, 2002; Goh & Taib, 2006; O'Malley et al., 1989; Vandergrift, 2007, 2003; Vandergrift & Tafaghodtari, 2010; Graham, Santos & Vanderplank, 2008, 2010; Laviosa, 1991, 2000; Rukthong, 2016; Field, 2012). For example, Goh and Taib (2006) encouraged immediate retrospection guided by questions such as 'What prevented you from getting the correct answer?' and 'What were you listening to?' in a study of primary school pupils concerning factors that influence their listening (i.e. task metacognitive knowledge) and how strategies can be used to facilitate their listening (i.e. strategy metacognitive knowledge).

Verbal protocols have both strengths and limitations. In essence, a key advantage of verbal protocols in listening is that they seem to reveal cognitive processes and strategies that participants engage in while performing a task, whether this was activated successfully or unsuccessfully (Field, 2012; Vandergrift, 1997, 2003, Rukthong, 2016; Goh, 2000). Particularly, verbal recall can reveal several listening processing problems, as has been evidenced in Laviosa (2000), who argues that 'some processes and strategies are more evident when comprehension breaks down; on the other hand, they may go undetected and unreported when the message is decoded correctly' (p.139).

Despite these advantages, certain concerns have been raised concerning verbal reporting, such as the issue of incomplete data. Ericsson and Simon (1993) indicate

that verbal reports allow for the 'bringing [in of] information ... then, when necessary, converting it into verbalizable code, and finally, vocalizing it' (p.16). Due to this, Kerchner (2013) writes, an individual may report only details that are in the range of their conscious attention. Furthermore, as Field (2012) argues, certain listening processes may be automatically activated yet fail to be reported by participants due to their being less easily accessible in terms of mental processes, which has been confirmed in various studies, such as that of Barkaoui, Brooks, Swain and Lapkin (2013). Furthermore, as Kerchner (2013) indicates, one verbal report may affect subsequent verbal reports due to the repetition involved in this technique, as well as a participant's familiarity with the procedure. As language used for verbalisation may affect the completeness of a study's data (Goh, 2002; Field, 2012), it is recommended that a participant should be allowed to use their L1 if possible. Finally, as some cognitive processes are only indirectly and partially represented in verbal reporting, researchers have to make inferences on cognitive processing data, as indicated by Kasper (1998). As the aim of this phase was to investigate real-time listening processing problems, a verbal report method was used, and great care was taken to avoid certain potential pitfalls of this technique.

In practice, a stimulated recall technique was used for this phase. This technique involved listening to four lectures taken from Phase 1 – two from literature-oriented and two from linguistics-oriented courses. However, the recordings used as listening material in these recalls were not entire lectures, as in the original event. Rather, only the lectures' beginnings were used; using complete lectures seemed impractical due to time constraints and the cognitive load that a verbal protocol procedure places on participants. From each lecture, I chose a substantial portion that could stand as an excerpt, starting from the lecture's beginning to create the sense that participants were listening to an actual lecture. Then, I broke each lecture sample into segments, with the divisions designed so that each segment contained a full idea unit, thus listeners would not experience any disruption to their thoughts (Table 5-1 shows the number of segments in each lecture and their length in minutes).

Table 5-1: Length of segments used in recalls

Poetry lecture		**Nineteenth-century literature lecture**		**Sociolinguistics lecture**		**Teaching techniques lecture**	
Whole SR* lecture sample	18:03**	Whole SR lecture sample	18:16	Whole SR lecture sample	11:28	Whole SR lecture sample	18:08
Section/1	3:18	Section/1	5:57	Section/1	2:13	Section/1	1:30
Section/2	1:07	Section/2	3:02	Section/2	1:49	Section/2	1:17
Section/3	1:27	Section/3	3:45	Section/3	1:14	Section/3	3:54
Section/4	3:30	Section/4	5:01	Section/4	3:25	Section/4	2:38
Section/5	1:57			Section/5	2:01	Section/5	4:45
Section/6	1:22			Section/6	2:06	Section/6	4:00
Section/7	5:09			Section/7	1:26		

*SR=Stimulated recall
**Length in minutes

Immediately after listening to each segment, a participant was asked to recall their experience while listening to the segment for the first time using the following questions as a guide.

1. Was it difficult or easy for you? Why? How? What was the problem?
2. Did you get a good understanding of what it was about? If so, why?
3. How did you listen to this segment for the first time?
4. Is there any aspect you would prefer they handled differently to help you understand better?
5. Would you like to tell me anything else?

As the lecturers had also used written materials in their lectures, these materials were collected while I observed them in Phase 1, and used as part of the input materials in the stimulated recalls, namely, the *Poetry* lecture was accompanied by a copy of the poem *Harlem* by Langston Hughes, the *Nineteenth-century literature* lecture by an excerpt from George Eliot's *Middlemarch*, the *Teaching Techniques* lecture by Chapter Ten from Larsen-Freeman's book *Techniques and Principles in Language Teaching,* which contains a section about task-based instruction, while the *Sociolinguistics* lecture had contained PowerPoint slides which were based on Janet Holmes' book, *An Introduction to Sociolinguistics.*

Piloting

The stimulated recall was piloted with two PhD students, from Lancaster University, on two lectures. Unfortunately, it was not possible to conduct the pilot with the target population due to my research base in the UK (and only occasional visits to the research site). Each pilot participant listened to a different lecture, following the procedure described in the previous subsection. The objective was to confirm that the lecture excerpts were understandable since, sometimes, lecturers used information from a previous class. This was something that could not be controlled for when establishing the corpus, because the lectures were organic. Another potential issue, which needed to be evaluated, was the division of segments; namely, whether the divisions affected comprehension and whether it was possible to grasp the full idea from one segment. During piloting, because one lecturer wrote on the whiteboard during the original lecture, but I had put these words on a separate sheet, the pilot participant felt this might distract the listener and suggested that a PowerPoint presentation be used instead and that the appearance of the words be synchronised to the lecturer mentioning them. Another issue that emerged was the importance of directing the listener's attention to the listening rather than the reading aspect, especially with literature-oriented lectures. These pilot recalls did not cause listening problems because I conducted them with proficient listeners. But they did assist me with optimising the recall procedure and gave me an idea of the time needed to conduct recalls (about 60 min. per participant).

Participants and procedure

As Table 5-2 shows, the main study's stimulated recalls were conducted with seven ELL students. To ensure a variety of participants in terms of listening ability, first, an IELTS listening test was administered to students from different levels of study in this research TLU (only the participants' scores who took part in the recall are reported). Based on their scores, some participants from different years of study and proficiency levels were randomly invited by email to take part. Each participant was given stimulated recall input matched to their year of study. It was ensured that they listened to a lecture they had not heard before but which they might encounter at their level of study.

Table 5-2: Bio-data of stimulated-recall participants

Participant	Year/Level	Age	IELTS listening score out of 40	Lecture listened to
P1	Y1/L3	19	16	Poetry – Harlem
P2	Y3/L7	23	17	Nineteenth-century literature – Middlemarch
P3	Y2/L5	20	16	Sociolinguistics – Age and gender
P4	Y2/L5	22	15	Teaching techniques – Task-based
P5	Y2/L6	20	28	Teaching techniques –Task-based
P6	Y1/L4	19	31	Poetry – Harlem
P7	Y3/L7	23	35	Nineteenth-century literature – Middlemarch

Each stimulated recall was conducted individually in a language lab at KSU. A laptop and a Bose speaker were placed on a nearby desk to ensure the sound was clear when playing listening materials. Before recall began, information sheets and consent forms were signed. Each participant listened to the lecture sample as a whole, took notes while listening, and then provided an oral or written summary according to their preference after the recording ended. Subsequently, each student listened to a lecture segment. Questions were asked after each segment (following the guide presented above). Recalls were audio-recorded and six participants spoke in Arabic, except P7 who spoke in English, based on their preference and to ensure that L2 proficiency did not affect the data. An example of a stimulated recall transcript can be found in Appendix I.

Coding

The stimulated recalls were transcribed and then imported into Atlas.ti. Data analysis was conducted on the Arabic transcripts to avoid data loss from translations. However, English translations were also made for inclusion in this thesis. It should be stressed that the stimulated recall data analysis is not concerned with how learners successfully activate listening processes and strategies. Instead, the analysis focuses on unsuccessful operations of processes and strategies to reveal inefficient L2 listening processing. A coding scheme drawn from the literature was used to analyse the data (Appendix G). As cognitive processes are indirectly verbalised (Kasper, 1998), I often made inferences about heeded information. This was mainly done by listening to the same part of the text corresponding to the participant's remark. I also

used notes and summaries during the coding to supplement the verbal reporting (but it should be noted that only the stimulated recall data were fully analysed). Following Gass and Mackey (2000), the stimulated recall data were categorised into segments and plausible units. In this study, this usually comprised a section of a transcript related to a segment of a lecture that a participant listened to. I coded listening problems reported by the participants in relation to their first listening process. However, sometimes these problems remained even after a second listening, so this was also coded as long as it was a problem. If the participant repeated the problem in another section whilst listening, it was coded again. Quite frequently, several listening problems occurred simultaneously; each of these was identified, quoted and linked to a code. For example:

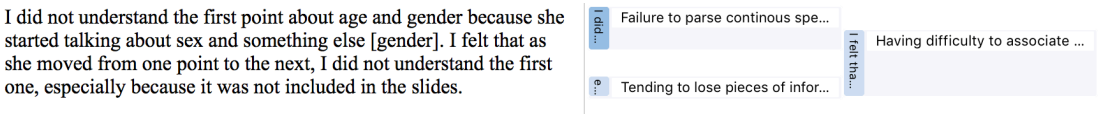


Figure 5-1: Coding example – Phase 2

In the text of Figure 5-1, three problems were identified and thus three codes were allocated. The participant did not understand an idea in the first listening but did so in the second listening. This suggested difficulty in parsing continuous speech. In addition, the participant had difficulty associating two different pieces of information relevant to each other to grasp the main idea here. The participant also seemed to lose information that was not presented in writing. An external coder—a PhD student with experience analysing verbal data, particularly on cognitive listening processing—double coded one stimulated recall. The coder received the coding scheme as well as audio recordings of lecture segments that were used in the recall. The data was translated into English. Each section after each recall was added to a table, and the inter-rater agreement was 81.82%. We then discussed agreements and disagreements, and I analysed the rest of the data independently.

5.3 Stimulated recall findings

Overall, the stimulated recall analysis shows that, when processing real-world lectures, different participants seem to find it difficult to engage in 22 processing sub-skills, which are tied to seven lower- and higher-level processes (see 2.3.3). The

analysis also suggests that certain participants did not use certain strategies successfully (directed attention, comprehension monitoring, elaboration), or used ineffective strategies (fixation, translation). These real-time listening problems were generally experienced by less-skilled listeners, rather than highly-skilled ones.

Below are more detailed findings for present listening problems regarding lower-level (5.3.1) and higher-level (5.3.2) processes and strategies (5.3.3). These findings are illustrated by quotes and frequency of mentions and, occasionally, lecture excerpts, notes and summaries.

5.3.1 Lower-level cognitive listening processes

Certain participants were found to experience lower-level processing problems related to input decoding, lexical search and parsing and establishing propositional meaning processes.

5.3.1.1 Input decoding

Problems associated with decoding include difficulty in recognising the acoustic shape of words in relation to their phonetic/phonological representations, as found in the phonological system of the language being heard (Field, 2004a). In this analysis (see Table 5-3), four decoding sub-skills were experienced as difficult by less-skilled listener participants.

Table 5-3: Input-decoding problems

Total	P1	P2	P3	P4	P5	Difficult processing sub-skill	P6	P7
3	2			1		Decoding/recognising a known word		
6	3	1	2			Decoding a word(s) in continuous speech		
2		2				Discerning prosody		
5	1		1	3		Processing several pieces of information in real time		

The following stimulated recall statement from P1 on the *Harlem* lecture shows that she did not recognise a (technical) word ('personification'), which she may have known already. Consequently, she could not immediately interpret its meaning:

> ***Quote/5.1***
> When she [the lecturer] personified it with a human being who was running, but in fact that is not so. <u>But the first time I did not understand [recognise]</u>

the word, and then I remembered it … It's personification … because I forgot this word. (P1/*Harlem*)

According to Goh (2000), two explanations can be given for such a listening problem. First, the participant may have already studied this term in a course, but perhaps only in written form, and neglected its pronunciation, thus resulting in difficulty in quickly recognising it through sound alone. Second, the participant's linguistic base may have yet to develop automatic 'sound-to-script relationships' in connection with the word. That is, the sound of the spoken word has not been stored effectively in her LTM. Another explanation could be that the participant lacked automatic 'word-referent relationships' via which known words are slowly activated (p.61).

Similarly, in listening to the *Task-based Language Teaching* lecture, P4 did not recognise the word 'method' (a word she was probably already familiar with) in continuous speech when listening to the lecturer's statement, 'we have three more methods to go'. However, P4 stated the following:

Quote/5.2
The first thing she said that there are three different tasks… . (P4/*Task-based*)

Another decoding hurdle may occur when an unknown word is inaccurately recognised. In the lecture on *Harlem*, when P1 heard 'there was a famous preacher at that time ... Martin Luther King, Jr.', she stated the following:

Quote/5.3
I expected him to be his president or the president of this city… . (P1/*Harlem*)

P1 did not appear to recognise the word 'preacher', which was possibly unfamiliar, and mentally substituted it with another phonologically similar word, 'president'. As the word 'preacher' was decoded as 'president', perhaps P1 trusted her top-down processes (i.e. her recollection of what she understood so far, regardless of whether it was correct or not) more than her decoding ability (Field, 2004b). Another explanation may be that because 'preacher' and 'president' share the same beginning sound, and 'the phonological space of possible words' can make it difficult for certain listeners to distinguish one word from another, the number of possible words that can be triggered upon hearing a word can be great (McQueen, 2005, p.6). Indeed, words

that share a similar sequence of sounds, such as alliterative words that begin with the same sound, words that rhyme, or even longer words with shorter ones embedded in them, may cause difficulties for some listeners (Lynch, 2009; McQueen, 2005).

Another decoding problem may occur when a listener is unable to decode or retain the sounds of words in their WM because they cannot recognise unfamiliar sounds in a connected speech stream (Field, 2004a), so they become unable to produce English words heard orally which indicate a decoding problem (a problem known as difficulty of vocalisation) (Graham et al., 2008). When listening to the *Sociolinguistics* lecture, P3 inferred that two types of grammatical gender were mentioned, but did not recognise or reproduce the terms 'gender-specific' and 'gender-neutral', which the lecturer stated in relation to what she was discussing. In response to this, P3 stated the following:

> ***Quote/5.4***
> I understood the second point in general, how to tell whether a word is masculine or feminine, this is divided, I think, into two types [she did not say the terms nor write them in her summary] … I understood that because it was written [on the slides]. If this was presented only orally … I wouldn't understand at all because I have to see the word [in written form]. (P3/*Age and Gender*)

Perhaps this problem occurred because, when P3 listened to the segmented lecture again, it was not accompanied by the lecture's slides, and she could not see the terms anymore. It is considered useful to use a written modality when listening to fill in missing words (Goh, 2014), as P3 did when listening for the first time. Furthermore, the fact that the listener could not isolate the pronunciation of unfamiliar terms from other words surrounding them in the speech stream (on a second listening), as can be inferred from her lack of reproducing them either orally or written, may reveal a problem at the decoding level.

Additionally, in the *Middlemarch* lecture, P2 reported difficulty identifying prosodic features in the lecturer's voice:

> ***Quote/5.5***
> Also, in the way she speaks, the tone of her voice goes up then down. This is confusing! ... I was concentrating, but then a sudden voice, my ideas get lost. (P2/*Middlemarch*)

Quote/5.6
She is stressing, she seems to get excited about some words, I feel she is trying to convey something but I feel she cannot. (P2/*Middlemarch*)

P2's perceptual recognition appeared unstable, as she appeared to be confused with regard to understanding phonological cues in the input, which may reflect her lack of the implicit phonetic knowledge necessary to recognise how and why speech can be produced in a stressed/accented manner (Carroll, 2008).

Finally, P4 appeared to have difficulty processing her listening in real time, as she expressed the following in her stimulated recall:

Quote/5.7
There were lots of words I could not keep up with … I could not understand what she was saying, should I understand the previous sentence? Or the one she is currently saying? (P4/*Task-based*)

5.3.1.2 Lexical search

Incomplete lexical search occurs when listeners are unable to retrieve what is known as a 'lexical entry' from their lexicon. A lexical entry includes information about a particular word, such as its meaning, spelling, part of speech, morphology and pronunciation (Field, 2004a), which is an important part of understanding aural texts. Table 5-4 shows the three lexical search sub-skills of difficulty, as experienced by the three less-skilled listeners.

Table 5-4: Lexical search problems

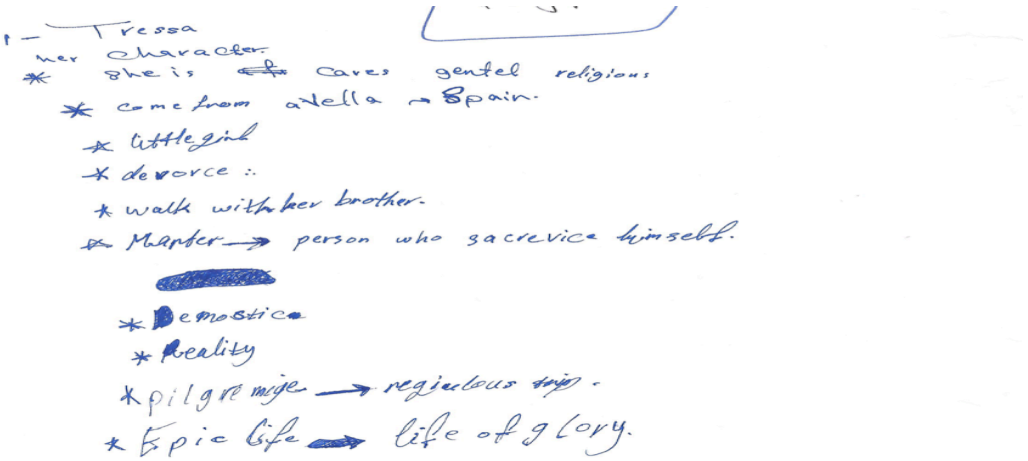
Total	P1	P2	P3	P4	P5	Sub-skill	P6	P7
8	3	4	1			Allocating meanings to words		
1	1					Understanding a synonym		
1		1				Linking an aural word to its written form (spelling)		

In stimulated recall, P2 reported that when reflecting on her experience of listening to *Middlemarch* as a whole, she did not comprehend half of the spoken text. Although this participant wrote keywords in her notes (see Note/5.1), she describes being overwhelmed by difficult words/terms in the following excerpt:

Quote/5.8

I understood 50/50 of the text ... I feel the vocabularies are difficult for me … I mean the language of the [literary] analysis [of the text], because when she talks normally [not when analysing a text], I understand her, but when she is analysing the novel itself I feel the words are hard… . (P2/*Middlemarch*)

Note/5.1



(P2/*Middlemarch*)

P1 had a similar experience when listening to the following excerpt:

Lecture excerpt/5.1

> Lecturer:…okay now let's look at the images. Let's look at the images here. Okay remember the images appeal to your five senses so look at this- so look at these lines and tell me what appeals to your senses. What can you hear? What can you see? What can you feel? Okay so *does it dry up like a raisin in the sun?* You know what a raisin is? Okay a raisin is a grape, okay, that shrivels and shrinks into something else. It becomes black. Okay now here we also have a simile correct? A simile is using what? 'Like' okay do we have more than one simile? Okay the whole poem, the whole poem is a simile. Okay so when you have the dream drying up like a raisin in the sun, you should have this image of a raisin, okay, under the sun. Now why do you think he uses this simile okay? It represents his dream dying; but remember we're in the civil rights movement, and who were described as being black? African-Americans! The African-Americans. Correct, and they had to do what? They had to do manual labour so they had to work long hours under the sun, okay, so that made their skin even darker so this associates - this connects between those African-Americans who work long hours in the sun. Okay, and it's also telling you that this dream- now whose dream is it? African-Americans. African-Americans, okay, and what do you think the dream they have, what is the dream they have? Freedom. Equality. They have a dream of equality…

P1 stated the following in her stimulated recall:

Quote/5.9

> This was hard. Honestly, I already have a problem with understanding these things like similes [figures of speech] … I understood that he is sitting under the sun, or the people are sitting under the sun, and they would become darker but I do not understand how this is related [to the discussion already given] … Perhaps because I did not understand 'raisin'. I know she is talking about the dreams … their dreams are like that, they are evaporating under the sun, or something like that, or even it disappeared under the sun … what is the relation of being becoming darker under the sun and the dreams? (P1/*Harlem*)

Based on the above quote, P1 was most likely focusing on listening to high frequency/familiar words, such as 'simile', 'dream', 'sun', 'sit', 'darker', 'African-Americans' and 'die', while having difficulty allocating meanings to less familiar words, such as 'raisin', 'grape', 'shrivel' and 'shrink'. Her attempt to create new lexical entries (i.e. meanings for unfamiliar words) can be seen when she interprets the words 'shrink' and 'shrivel' as 'disappear' and 'evaporate' to fill in gaps in her understanding. These interpretations are inaccurate (but not unreasonable), which

suggests a weakness in her lexical searching process, resulting in a fragmented comprehension of utterances at the local level.

In another issue involving lexical searching, P2 did not know how the word 'martyr' was spelled, as her notes show (5.1) her to have written 'marter'. From this, it can be concluded that she did not link the aural word to the written form 'martyrdom' in the written text as articulated by the lecturer, who said 'to go and seek martyrdom, what is martyrdom? What is martyr? A person who sacrifices… .' P2 stated the following in her stimulated recall:

> ***Quote/5.10***
> I understood that she is discussing Theresa's character, her qualities, and when she went with her brother, and the martyr, this person … I feel there was something that wasn't clear … Surprisingly, they jumped to discuss 'martyr', and she asked, 'Who is a martyr'? What does 'martyr' mean? They explained its meaning, a person who sacrifices himself ... I understood the meaning, but is this martyr are there with them? … I do not know what the relationship of this [martyr] is with Theresa and her brother. (P2/*Middlemarch*)

Finally, in her stimulated recall, P1 reported that she did not understand the meaning of a word that was used as a synonym to clarify a word in the written text. P1, who heard 'deferred means postponed', stated the following:

> ***Quote/5.11***
> The word deferred, I think she explained it, but I did not understand it. (P1/*Harlem*)

5.3.1.3 Syntactic parsing and propositional meaning

Weak parsing occurs when listeners fail to segment the speech stream and combine words according to their syntactic structures, resulting in a failure to obtain semantically meaningful text units ('propositions'), which make up parts of parsing output (Field, 2004a). As can be seen in Table 5-5, the less-skilled and average-level listeners were found to have difficulty parsing continuous speech so as to construct the meaning of a proposition.

Table 5-5: Parsing problems

Total	P1	P2	P3	P4	P5	Sub-skill	P6	P7
13	6	2	2	2	1	Parsing continuous utterances and constructing the meaning of an utterance semantically		

For instance, in the *Harlem* lecture, P1 did not appear to parse and construct the propositional meaning of the utterance chunk 'a place where', which is a (location) relative adverbial pronoun that introduces a relative clause in the following part of the lecture:

Lecture excerpt/5.2

Now Harlem is this city in New York where the civil rights movement began, okay? That means that the African-Americans were involved in a struggle in a fight, okay, for freedom for equality. You know, what equality is? To be equal with the whites. Okay, so Harlem was the centre of this movement; Harlem was also a place where there was a big black population; you had a very large African-American population there.

P1 stated the following in her stimulated recall:

> ***Quote/5.12***
> I know it's correct that Harlem is a city in New York, but is he or his name Harlem as well? What I understood is that there were problems at that time between blacks and whites, and Harlem, the one who is talking here, was doing something. (P1/*Harlem*)

At the same time, there may be a higher-level processing problem as well. P1 understood that Harlem is a proper name, but did not understand that, whenever the word was referred to, it was strictly the place, which could be related to issues of meaning-making, including syntactic processing across utterances.

Another example of weak parsing occurred when P3 appeared to listen to utterances word by word instead of assembling them into grammatical structures and grouping words in a speech stream in a quick, fluent manner (which unskilled listeners/readers tend to rely on (Field, 2004a). Regarding this issue, P3 reported:

> ***Quote/5.13***
> I just need to first try to understand each word and what it means, and then I combine them together to understand the piece of information… . (P3/*Age and Gender*).

The issue of listening to utterances word by word also seemed to stem from P3's use of the 'online translation' cognitive strategy, as will be shown in 5.3.3.

5.3.2 Higher-level cognitive listening processes

Certain participants were found to experience higher-level processing problems related to inferencing, building a mental model, creating a text-level representation and an intertextual representation.

5.3.2.1 Inferencing

Ineffective inferencing occurs when a listener fails to relate individual, literal propositions to one another by adding different types of information (background, topic, pragmatic knowledge) to enrich the raw meaning of propositions (Field, 2013). This analysis shows that there are five inferencing sub-skills that can cause difficulty (Table 5-6)

Table 5-6: Inferencing problems

Total	P1	P2	P3	P4	P5	Sub-skill	P6	P7	Total
1					1	Understanding a speaker's implicit intention			
1	1					Drawing a parallel between what is said literally and metaphorical meaning	1		1
3	3					Understanding a text that is irrelevant to background knowledge		1	1
3	1	1			1	Making inferences to understand			
2					2	Making unclear parts of input comprehensible		1	1

Speakers' intentions are an aspect of communication sometimes conveyed without the speaker overtly stating or even directly implying them, and it is important that listeners correctly infer intentions to make meaning, as indicated by Rost (2014). Implicatures, or 'pragmatic accent', are 'aspects of our talk that we assume are communicated without being said ('intersubjectively understood expectations')' (Rost, 2014, p.138). For example, when listening to the following part in the *Task-based Language Teaching* lecture:

Lecture excerpt/5.3

The *lecturer*: 'Do you think that the task- this task will be a linguistic one? We're expecting, we're just thinking do you think that this task will be a linguistic one? In other words do you imagine that the task will be transforming sentences from active to passive for instance? What do you think?'
Student: 'It will be about that subject matter'.

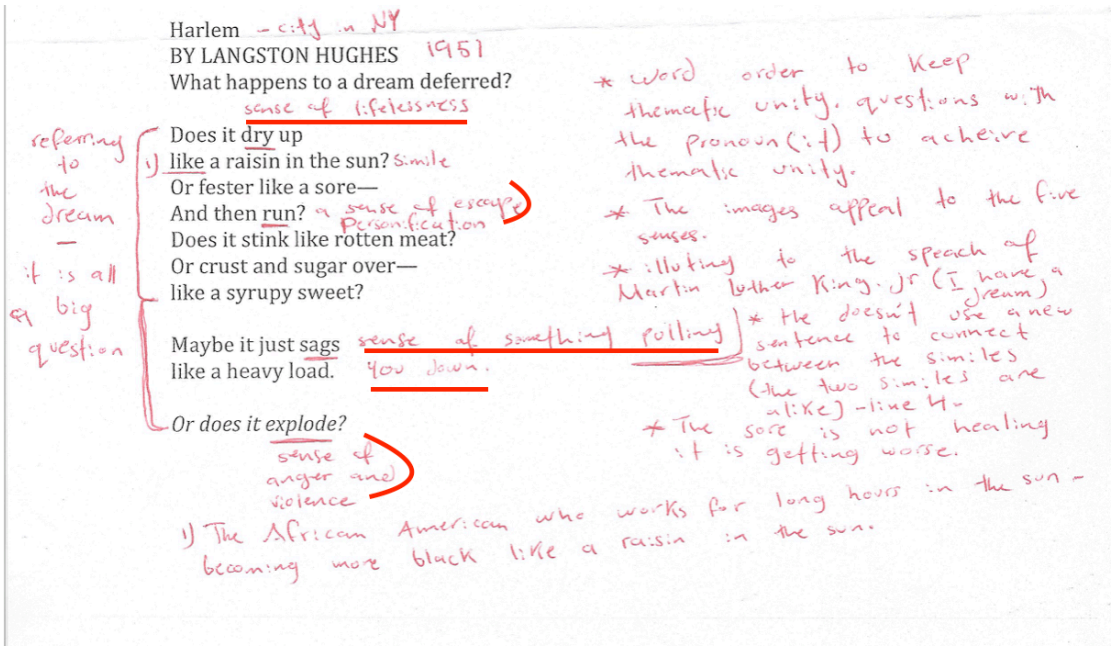
P5 said:

> ***Quote/5.14***
> I understood this in the first listening, in which they learn something based on the tasks they are given, tasks above their level, challenging tasks … tasks that may contain new terminology for any subject ... subject matter, given in the second language, not in their first language. (P5/*Task-based*)

Based on the stimulated recall statement above, P5 failed to infer the speaker's intention by supplying pragmatic information, despite the fact that the lecturer was strongly hinting what the expected answer was; however, the student in the class didn't realise this, and neither did P5.

In addition to failing to supply necessary pragmatic information, listeners may also construct incomplete meanings by failing to draw upon knowledge of entities and ideas when the speaker refers to them (Field, 2013). For example, P6 did not seem to grasp the connection between the literal and the metaphorical meaning of some of the ideas mentioned in the *Harlem* lecture (see Lecture excerpt/5.1). In this case, the lecturer expected the students to go beyond the literal meaning of what she was saying and appreciate things that were implied by drawing on their knowledge regarding the characteristics of entities and the information provided in the discussion. P6 did, however, seem to follow and understand that certain words in the text have metaphorical meanings, as her notes (5.2) show:

Note/5.2



(P6/*Harlem*)

But P6 stated the following in her stimulated recall:

Quote/5.15

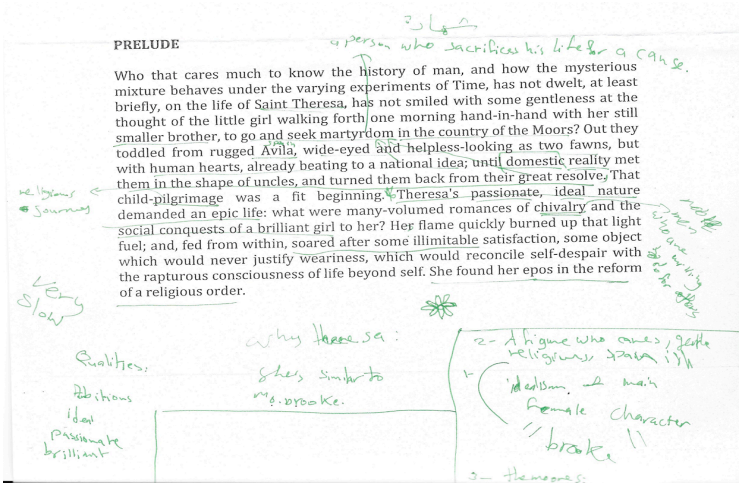
<u>It was a bit difficult to comprehend the question: How does it appeal to the five senses? She didn't explain the five senses; I know hearing, talking ... but then she made a point which I felt was disconnected from the initial question asked.</u> If I was attending the lecture, I would have asked, 'How does it appeal to the five senses?' She made a point and then jumped to another point without explaining how it all connects. It was unclear. (P6/*Harlem*)

This statement suggests that P6 managed a literal interpretation of the speaker's utterance, especially the question 'how does it appeal to… ?' based on her notes and recall; however, she did not seem to understand the speaker's intended meaning, which required the addition of semantic information drawn from world knowledge. Thus, P6 experienced difficulty with achieving a deeper level of comprehension by appreciating the implied meaning behind the raw words and activating a visual representation of the concept, and her understanding remained casual and at surface level (Zwaan, 2015). In summary, processing metaphorical information seemed to cause difficulty for P6. Comprehending metaphors/analogies not included in the poem but mentioned in the class discussion requires listeners to supply semantic information from world knowledge. This type of information seemed to be

unavailable to P6, and thus she failed to notice connections between literal and metaphorical meanings.

Additionally, based on P7's notes (5.3) and oral summary (5.1), following Enright et al.'s framework (2000), she seemed to achieve *basic comprehension* by comprehending and inferring the lecture's key points. She also correctly processed many details with accurate identification of their location, thus achieving *detailed comprehension*, a level beyond the main theme, and succeeded in demonstrating *coherent comprehension* by being able to integrate propositions and link different pieces of information heard, ignoring peripheral information.

Note/5.3



PRELUDE

Who that cares much to know the history of man, and how the mysterious mixture behaves under the varying experiments of Time, has not dwelt, at least briefly, on the life of Saint Theresa, has not smiled with some gentleness at the thought of the little girl walking forth one morning hand-in-hand with her still smaller brother, to go and seek martyrdom in the country of the Moors? Out they toddled from rugged Avila, wide-eyed and helpless-looking as two fawns, but with human hearts, already beating to a national idea; until domestic reality met them in the shape of uncles, and turned them back from their great resolve. That child-pilgrimage was a fit beginning. Theresa's passionate, ideal nature demanded an epic life: what were many-volumed romances of chivalry and the social conquests of a brilliant girl to her? Her flame quickly burned up that light fuel; and, fed from within, soared after some illimitable satisfaction, some object which would never justify weariness, which would reconcile self-despair with the rapturous consciousness of life beyond self. She found her epos in the reform of a religious order.

(P7/*Middlemarch*)

Oral summary/5.1

> Okay. So um well this lecturer is like I think she's - she's introducing the novel to - to her students and so um, the - at the beginning of the novel the writer was speaking about [Saint Teresa] and how she - what is this? I can't read my handwriting. Anyway. Uh, that's [laughs] why I use the laptop.
>
> Oh, right.
>
> Uh, so…
>
> That's fine.
>
> Uh, yeah, so um Saint Teresa is here um, just - um, what was I gonna say? [Pause] What was I gonna say [laughs]? Sorry. Um, she's described, yeah. Lack of sleep is bad. She's described as um, a person who is seeking [shahada]. Um, she - um she gives - basically she gives all her life to - she wants at least to give all her life to - to - for a national idea. Uh, and - and - here they - they put it as an idea which - which emphasises the - the important (sic) of - of this thing to her.
>
> Um, um uh, she's described as passionate, ideal um, ambitious, brilliant, um and then she - she pointed out - uh, I mean the professor pointed out why they chose um, Saint Teresa and uh, she says that it's because she's similar to the main character in the novel, which is [Ms Brook]. Um, [pause] um, she - she represents the idealism of the main character. This is - this I think was said in the beginning of the uh, lecture.
>
> Uh, [pause] yeah, um, yeah that; - that's uh, yeah and - and it says here that um, she's an - she - she's um described as a person who's in a religious journey as a child and that this religious journey stayed with her - with her and - and she continued to have this feeling that she wanted to always act upon and she did. Um [pause] as it said here, the reform of religious order. Yeah, that's - that's all I got.
>
> (P7/*Middlemarch*)

However, she reported the following:

> ***Quote/5.16***
> It was focused on very small details and I think … this distracted the attention from the bigger picture and an understanding of the text as a whole … I might now understand every tiny detail but, in terms of the overall text, I will have to go through it myself to understand it. And so I don't think the lecturer helped me at all with that. (P7/*Middlemarch*)

P7 seemed to struggle with 'the ability to use the information acquired from the text productively in novel environments', namely, 'learning from [oral] text' (Kintsch, 1998, p.290). Her indication that the lecturer did not help her grasp the content might be due to the lecturer's style or the absence of prior knowledge about the context (situation) of the novel *Middlemarch* (i.e. religious beliefs and their application, along with pilgrimages of saints to the Spanish town of Avila). Hence, P7's 'good situation model', often created by relying on general, world and domain knowledge to fill gaps in comprehension, was incomplete (Kintsch, 1998).

Finally, a listener might not supply meaning from speaker-omitted content (Field, 2013). This problem was evident when participants had difficulty making unclear

parts of input comprehensible. P5 had difficulty clarifying some parts of the content delivered in the lecture, particularly if not enough direct information was mentioned. For example, although the lecturer reviewed the language-teaching techniques that students learned in previous classes and made sure the reviewed information was clear, it seemed to confuse P5, who reported:

> ***Quote/5.17***
> I do not usually have a problem with comprehending new information being presented, but because she was talking about things that the students had already studied, this is hard, and I still feel that I needed to attend to the previous part or read it. (P5/*Task-based)*

P5 seemingly felt she could not filter and discriminate between new information and information already given, nor could she infer why the instructor was including old content from a previous lecture. Because the instructor was reviewing previous information in a less detailed way, P5 seemed to have problems understanding the whole lecture meaningfully and making the content clear for herself, even after a second listening.

5.3.2.2 Building a mental model

Difficulties with building a mental model occur when the listener finds it difficult to integrate incoming utterances into a mental representation of the text (Khalifa & Weir, 2009). This analysis shows that there are three difficult sub-skills related to this process that participants did not seem to engage in successfully (Table 5-7).

Table 5-7: Building a mental model problems

Total	P1	P2	P3	P4	P5	Sub-skill	P6	P7	Total
7		3	2	1	1	Associating different pieces of information to keep up with a main point expressed in a section	1		1
4			1	2	1	Recognising supporting details			
3	2	1				Recognising a discourse marker			

Associating different pieces of information beyond an utterance level might be challenging for certain listeners. For example, P2 seemed to make meaning by picking out keywords from the section to which she listened, such as ‘pilgrimage’, ‘passionate’ and ‘epic life’, but she failed to make meaning from different utterances related to each other or to keep up with the main point expressed in a section. P2 said:

Quote/5.18

I did not really understand this part, even now [after a second listening]. I only got some terms, some words, I didn't grasp anything … I only understood the terms, such as 'pilgrimage' … I forgot … I was focused but I cannot remember because I cannot formulate an idea about this … I'm trying to relate the one before [previous section], but I feel it does not work. (P2/*Middlemarch*)

So, P2 also seemed unable to engage in associating what had been said (new information) with existing knowledge (what has been understood in a previous section).

Another example of difficulty in making meaning based on different utterances is when P2 listened to the following part in the *Middlemarch* lecture:

Lecture excerpt/5.4

Lecturer:	Okay, and how are the uncles described? No, before that. U*ntil domestic reality met them in the shape* - or in the form - *of uncles*. What is domestic reality? What is reality? What is reality? Real life, okay. Domestic means? Yes, with, you know, anything close, with the home. Domestic reality, the reality surrounding them, local reality, what is related very close with them, what is related to the home. This is *domestic reality met them in the shape of uncles*. And what did their uncles do?
Students:	They turned them back.
Lecturer: had made.	Yes, *from their great resolve*. From this great decision that they

Quote/5.19

I understood that Teresa went with her brother to sacrifice, then it is like someone came to them, she said her uncle but not really her uncle. I am unsure here. (P2/*Middlemarch*)

Furthermore, identifying supporting details related to a key point might also be difficult. When listening to the *Sociolinguistics* lecture, P3 seemed to focus on the example mentioned by the lecturer but ignored the supporting theoretical detail related to it, which was about seeking mutual agreement in society via speech; the lecturer repeated it three times in this excerpt:

Lecture excerpt/5.5

Yes, so basically when we use hedges as females, we feel like there is mutual agreement. Mutual agreement, this is what we see women generally seek in society, mutual agreement. That is why once a woman goes and says I have a headache, the other one, I have a headache too. I have - I feel you know sad today. I feel sad too. You see? So basically you say something, she would feel the same, just like you. Why? Because this is how to seek agreement. We want to be in harmony. We want to actually feel that we are part of a whole and not a single individual. Do you understand?

Yes.

Okay. Not like the guy, if one guy says I have a car, the other one would say I have two cars, so they challenge. It's not like- uh when it comes to gender, men are more challenging, but females seek agreement. We're the same, do you understand?

Yes.

This is what they say; we're the same, okay, I feel what you feel, I understand what you say. That is why yes, uhuh, uhuh, they are more supportive. Do you understand?

Accordingly, P3 stated:

Quote/5.20

This is related to what was said before. She is just applying, men like challenge in general, for example when they say not just one car but two cars, while women are the opposite they are supportive. (P3/*Age and Gender*)

Finally, recognising a discourse marker might not be easy. P1 listened to a section starting with a lecturer saying 'What do you notice about the sentence structure here?' to announce that she was beginning to discuss the structure of the written poem; however, P1 did not seem to recognise such a discourse-structuring phase, and reported:

Quote/5.21

I did not understand [this part in the first listening]. For example, it uses 'it' a lot to refer to the dream to make it a lot I did not understand this ... I was only focusing on the story she was talking about, then when I re-listened I realised she was talking about other things [such as] … the use of questions, then it. (P1/*Harlem*)

5.3.2.3 Creating a text-level representation

Problems experienced when creating a textual-level process occur at a more global level. These problems are mainly related to the listener's difficulty with creating a discourse-level structure on the whole text just processed (as a final process) by

recognising its propositions in a hierarchical structure so that different parts of the text fit together and propositions are arranged in terms of their centrality to the text's meaning. That is, the listener might understand some meanings at a proposition level but cannot build a mental discourse (macro-structure) representation of what is said, largely due to a limited linguistic base and a lack of schematic knowledge in general (Kintsch, 1998). This analysis shows three problems related to this process (Table 5-8).

Table 5-8: Creating text-level representation problems

Total	P1	P2	P3	P4	P5	Sub-skill	P6	P7	Total
4	1	1		1	1	Ending up with a coherent meaningful construction of what has been heard			
1	1					Associating different pieces of information in the whole text			
5	1	3			1	Processing a lecture presented in an unfamiliar way		4	4

In this phase, the main indication of participants' unsuccessful ability to create a text-level representation is an incoherent, disorganised representation of the main point of the text as provided in the summary of the lecture that a participant listened to. For example, when listening to *Harlem* (as Oral summary/5.2 shows), P1 did not seem to connect individual spoken pieces of information coherently or to link them to the gist of the topic because she did not understand the main point in the way P6, a high-scoring listener, did when listening to the same lecture. P6, for example, started her summary (see Written summary/5.3) with the lecture's main theme: African-Americans' struggle in the US, their dream of equality, and when the poem was written; she followed this by giving more details such as similes and personification based on the discussion she understood accurately.

Oral summary/5.2

Based on the general story of the poem, the teacher was talking about a black person, and in that time they were suffering from racism. I think that the whites were controlling, or dominating them. I think he was a worker, and he was working really hard, and his hands were hurting him, and even he got pimples on his hands. He was planning to do something, and his dreams were something like he is not going to achieve them. His dreams were destroyed. Based on the poem, I expect the dream to be something related to him, and people around him, too. There is a main question in the poem, and everything relates to this question. Also, there is a simile that honey has changed and became like sugar, or something hard like glass, something bad because of its old nature, which has changed. There is also a dash used in a sentence. The dash used between the question and a sentence to complete it as they do in poetry. Because I think it is a simile. Such as in this stanza: Like a raisin in the sun? Or fester like a sore-- .

Basma: I understood many details but I feel I have forgotten them (Said by the participant after producing this summary).

(P1/*Harlem*)

Written summary/5.3

The poem is about the struggle of African-American people who are separated from white people and not having their rights. It was written when the movement of getting their rights was started. The speaker, who is also a black person, has mentioned that his people's liberty and freedom is like a dream, he then explains what will happen to the dream? Will it be postponed? Or will it dry up like a raisin in the sun? There is a simile here between a raisin in the sun and the African-Americans who work hard labor and for long hours to become even more black. There is also a personification, where the speaker says that the sore will run giving the sore the human quality of running.

(P6/*Harlem*)

Also, P1 reported during her stimulated recall that she thought that ideas heard in the lecture were disconnected from one another, which might reflect that she had difficulty associating different pieces of information at a global level. She stated:

> ***Quote/5.22***
> I feel the poem [analysis] is confusing, it moves from one thing to another, I feel it is disconnected. (P1/*Harlem*)

Finally, another hurdle facing certain listeners was difficulty in processing a lecture presented in an unfamiliar style; for instance, P7 stated:

> ***Quote/5.23***
> 'So the style I prefer, as I said before, is for the whole text to be kind of previewed and then commented upon so I can understand the whole text and then we can even go into detail after kind of previewing the whole text and not by vice versa.' (P7/*Middlemarch*)

5.3.2.4 Creating an intertextual representation

In terms of inefficient processing, and based on this phase, incomplete creation of the intertextual representation process may occur when a listener cannot associate the meaning derived from a lecture (aural speech) with other (written or aural) input in the lecture hall, e.g. a textbook, slides or linking speech (content) from different speakers (other students). Table 5-9 shows that there are three sub-skills to use while listening, related to those used in creating an intertextual representation, that lower-scoring listeners and one high-scoring listener had difficulties with.

Table 5-9: Intertextuality problems

Total	P1	P2	P3	P4	P5	Sub-skill	P6	P7	Total
1			1			Linking aural input to written material (slides)			
3	2	1				Linking what the speaker is elucidating to written material (textbook)			
6				5	1	Linking discussions or input from other speakers (students)	2		2

In the *Sociolinguistics* class, P3 heard the expression, 'Let's take it one by one', but this caused her difficulty, and she reported:

> ***Quote/5.24***
> Initially, she stated the first type [of minimal responses], one syllable and then talked about it, then what is the second type [that] deals with two syllables? She did not discuss it or give examples on it. (P3/*Age and Gender*)

The instructor was referring to the definition of minimal responses presented in the slides and had split them into parts to explain their meanings. P3 mistakenly thought the speaker was going to mention two different types of minimal responses, revealing a potential problem with following or connecting aural input simultaneously with written information (slides).

Another example came from P1, who followed the *Harlem* poem as a text accompanying the discussion, but it seems that she had a problem processing the meaning of the discussion and connecting it to the text quickly enough to keep up with the lecture, especially when there was dense information in the section she heard (several points to be processed at one time), so she reported:

Quote/5.25

I was focusing on the first question [What happens to a dream deferred? written in the text], then she said 'Does it dry up?' and then I looked for it … it moves from one place to another, and this makes it a bit hard to understand. (P1/*Harlem*)

Another issue reflecting ineffective intertextuality is listeners' difficulty coping with high levels of interaction. That is, some listeners might be sensitive to any diversion from the main lecturer's speech, as experienced by P6, who said:

Quote/5.26

I was focused; there was nothing that could have taken my attention away from the lecture. However, if the girls had interrupted, I would not have been able to function. It was really easy for me to pay attention to this particular lecture. Other students sometimes ask questions that are off-topic and then I feel unfocused… . (P6/*Harlem*)

Based on this quote, P6 reported being able to understand the lecture because it did not contain much input from multiple speakers. P6 seemed to find it difficult to link contributions from students to what the lecturer is saying because students might go off-topic, and this might interfere with her concentration and, consequently, her comprehension (based on her general listening experience in this discipline).

P4 also seemed to have difficulty understanding other students; she reported:

Quote/5.27

She interacted with the girls a lot, and when they answered, this distracted my attention a bit … because I could not hear their talk, [the voices] were unclear, and what happens is that only the teacher understands them … This usually affects my comprehension of the entire lecture … students do not usually give complete answers. (P4/*Task-based*)

Although P4 refers to a physical audibility issue that may be due to the lecture environment, she also expressed difficulty with linking students' short, incomplete responses to the discourse representation she was trying to form. Thus, it could be concluded that listening to multiple speakers in addition to the main speaker in a lecture has a negative influence on her attentional resources

5.3.3 Ineffective strategy use

Table 5-10 shows two metacognitive strategies (directed attention, comprehension monitoring) that certain participants did not use or used unsuccessfully, as well as two

ineffective cognitive strategies (fixation, translation), and so another cognitive strategy elaboration appeared to be used.

Table 5-10: Ineffective strategy use

Total	P1	P2	P3	P4	P5	Strategy	P6	P7	Total
5	2	2			1	Directed attention		2	2
4	2		1		1	Comprehension monitoring			
1			1			Fixation			
4			4			Elaboration			
3	1		2			Mental translation			

5.3.3.1 Metacognitive strategies

1. Directed attention

The directed attention strategy helps listeners to refocus their attention upon realising that it has slipped and to make a clear choice to intensify their concentration (Goh, 2002). The analysis showed four participants did not successfully use directed attention strategies when they were needed.

Directed attention strategy requires a listener to continue listening despite having difficulty understanding input. When P1 heard an unfamiliar technical term and consequently did not grasp what followed, she reported:

> ***Quote/5.28***
> When I re-listened I noticed she is talking about other things … For example, there are words she used I did not get like thematic unity … because it is the first time I encountered it … you know when you face an odd word I get stressed and then I miss the next [chunk of what is said]. (P1/*Harlem*)

The above quote shows that P1 gave up when faced with a lexical processing problem, and that her attention was probably lost.

Another potentially problematic issue affecting participants' attention occurred when linguistic redundancies were used in *Middlemarch*. P7, for instance, appeared to be using directed attention strategy, yet too late for its success, as stated in the following:

> ***Quote/5.29***
> Yes [I lose concentration], because of dwelling too much on certain areas, then you lose focus and when you pay attention again they've moved on

> from the point they were dwelling on … in terms of understanding? I understand fully. In terms of concentration I faced a very hard time trying to concentrate. And I think if it wasn't for me trying to listen because of this kind of situation I wouldn't have tried to listen anyway. (P7/*Middlemarch*)

Furthermore, P2 appeared unable to self-monitor her attention while listening when seeking to elaborate a problematic part of a text. As such elaboration appeared implausible, it was difficult for her to regain her attention easily, as she reports in this excerpt:

> ***Quote/5.30***
> When I do not understand, I try to elaborate on it [the idea] in my mind, and when it does not work, I lose attention. (P2/*Middlemarch*)

Finally, P5 reported that she found it difficult to direct attention during the first listening, yet she said that her second listening helped her to improve her focus and better direct her attention:

> ***Quote/5.31***
> I grasped a bit more [now] … on a first listening I was a bit lost, I did not feel I got the idea of this beginning section … but when I tried to focus more I understood … and I even discovered that I understood something wrong [on a second listening]. (P5/*Task-based*)

2. Comprehension monitoring

Comprehension monitoring requires the listener to verify and check their comprehension while listening in order to ascertain whether it has truly occurred and make any necessary adjustments (Goh, 2002). As Table 5-10 shows, two participants failed to discard irrelevant interpretations by verifying initial hypotheses in relation to later information or by determining hypotheses to contradict information heard when listening.

P1 did attempt to question her comprehension and realised she had problems with comprehending the proper noun 'Harlem'. However, she appeared unsuccessful in determining the meaning of utterances. She understood Harlem to be a city/district in New York, but she also thought Harlem was a person referenced in the discussion and poem, which the following quote shows:

Quote/5.32
At first, I did not understand what Harlem is. I thought Harlem was his name, but now I discovered Harlem is a city in New York but does Harlem refer to both his name and the city? Am I wrong or right? But is his name Harlem as well … Is his name also Harlem? (P1/*Harlem*)

However, after re-listening to the lecture, P1 still did not discard her illogical interpretation of Harlem by verifying her hypotheses in relation to what she heard or by recognising that her hypotheses did not fit the meaning conveyed in the lecture, despite the fact that she recognised that she had problems understanding what Harlem is.

In addition, P3 did not correct an incorrect meaning she constructed from the aural message in relation to the information written on the slides, despite being aware that her interpretation contradicted the written information, as the following comment shows:

Quote/5.33
Also, when I read [the slide], I felt that there is no second type despite that she said [what] the first type is and she talked about it, but I was waiting for the second type, but she continued talking about the idea in general… . (P3/*Age and Gender*)

5.3.3.2 Cognitive strategies

1. Fixation

Fixation involves dropping everything else to focus all of one's attention on comprehending a small part of a text during listening (Goh, 2002). The analysis reveals only one participant to be using a fixation strategy to cope with a problematic aspect of the input (Table 5-10).

P3 appeared to fixate, whilst listening, on remembering familiar and/or unfamiliar word spellings. This problem was especially evident when slides were not available, which happened during her recall session. Taking time to spell words and then constructing meaning at a propositional level appeared to cause her to miss incoming information, which can been seen in her stimulated recall statement:

Quote/5.34
Certainly when I was listening with slides is much better because I see the word itself and have it orally! But if I am only listening to it, this would

weaken it [my understanding] because I will first try to remember the same word and its spelling, then I will try to connect it with the meaning she is conveying, but then what happens is that I miss the [other] explanations... . (P3/*Age and Gender*)

2. Elaboration

In the elaboration strategy, a listener draws on their general knowledge (from outside the text), relating it to new knowledge gained to fill gaps in their understanding (Goh, 2002). This analysis revealed that only one participant used elaboration, yet in a way that suggested difficulties with lower-level processing (Table 5-10). While trying to construct meaning from the *Sociolinguistics* lecture, P3 appeared to activate relevant background knowledge to understand the aural material, which the following remarks illustrate:

Quote/5.35
This [section two] was easier [than the previous section] because it does not only depend on the oral thing! It contains general information but it was said in English, information we already understand from our culture, like women always support when they talk, while men don't do that. I felt that she talks about something real. (P3/*Age and gender*)

Quote/5.36
I understood everything in general, but if you ask me to recall everything, I will not be able to connect the ideas together. I understood it but I cannot explain it. (P3/*Age and Gender*)

Quote/5.37
[General discussion] the topic is easy, something from the society … it does not require effort like to memorise because I could relate it to another thing [general knowledge] and it works. (P3/*Age and Gender*)

The above quotes suggest that the majority of P3's comprehension may derive from her knowledge of the topic 'gender and language', as well as using logic and common-sense elaborations. However, her remark '*but if you ask me to recall everything, I will not be able to'* suggests that excessive use of world elaborations led to the emergence of another problem: her inability to ensure precise comprehension (detailed recognition) or memorise what has been said. P3 appeared to focus only on the general idea of pieces of information, resulting in her having difficulty recollecting what she heard, in her own words: '*I understood it but I cannot explain it'* (generating knowledge is an indication of comprehension). The latter may be a sign of superficial interaction with an oral text, in which case, as Vandergrift (2003)

argues, ‘a strong conceptual framework never develops, and […] understanding remains incomplete’ (p.483).

3. Mental translation

L2 learners have (at least) two languages at their disposal – their L1 and the target language. Kern (1994) writes that translation involves a mental reprocessing of L2 forms into familiar L1. This strategy stems from a ‘lack of automaticity in word recognition as well as working memory span limitations’ (Kern, 1994, p.448). Based on L2 reading, Kern (1994) found that mental translation can facilitate semantic processing (i.e. fragmented meaning in L2 can be semantically consolidated in L1). Thus, Kern emphasises that translation does not always hinder comprehension. But listening is unlike reading, because readers can reread sentences to translate them but listeners cannot always re-listen. Goh (2002) argues that translation prevents listeners from keeping up with the input, resulting in slow processing. Specifically, as Vandergrift (2011) indicates, their WM resources are not used adequately to hold meaning, to apply background knowledge and to integrate meaning. Hence, many scholars discourage using this strategy while listening (Vandergrift et al., 2006; Graham & Macaro, 2008) for the development of effective listeners (Vandergrift, 2011). This analysis shows two participants engaging in translation (Table 5-10).

In her stimulated recall, P3 mentioned:

> ***Quote/5.38***
> This section is easy now [on a second listening], but I did not really understand it when I first listened to it … because [in the first listening] I did not have the time to keep up with it, and translate every word … Yes, generally, I translate the word quickly so I can relate it to the other. In first listening, I understood it in general, in general. (P3/*Age and Gender*)

> ***Quote/5.39***
> But literature classes may have been more difficult for me to understand because I usually translate the word, and then I understand. But [in the case of literature] this sometimes does not work, because my translation turns out to be wrong, and I discover that I related it to a different topic … It is easier to follow a linguistics lecture because the content is not literary and the ideas in it have a strong relation to society, but literary language, literary terms and words are not understandable... . (P3/*Age and Gender*)

P3 seemed to rely overly on word-for-word translation, and had to rapidly translate to keep pace with increasingly overwhelming input, which she may have been unable to do on a first listening. Perhaps this was because the lecturer used unfamiliar words such as 'softeners'. Additionally, this strategy reduced her level of attention and ability to synthesise the meanings of familiar words, which resulted in difficulty in developing an accurate semantic meaning at either a local or a section level. This difficulty was a result of the fact that her WM limits were exceeded during the first listening ('*I did not have the time to keep up'*). Consequently, her remark—'*I understood it in general*'—suggests the utterances were assimilated by translating familiar L2 words and by inferring unfamiliar words based on meanings generated from translated words. Translating words into L1 and then semantically combining them may suggest the use of 'L1 chunking processes', as P3 indicated: '*I can relate it to the other*'. Kern (1994) explains if translation works well at the word level and the semantic level, then the comprehension process might fully proceed in L1. P3's remark that the lecture was easy and sociolinguistics tackles universal topics she can relate to may suggest that translation allowed this listener to assemble meanings at a discourse level in L1. P3's approach seems to support Kern's (1994) view that translation is used 'not so much for control of vocabulary but rather for control of propositional content' (p.450). Hence, using this strategy may indicate a processing problem during the establishing propositional meaning process.

5.4 Summary

The Phase 2 analyses provided insights into seven listeners' current listening needs (i.e. PSA). The analysis showed 22 types of real-time processing problems related to seven cognitive processes that listeners seemed to fail to successfully activate during lecture-listening. Some metacognitive (comprehension monitoring, directed attention) and cognitive strategies (elaboration) were used unsuccessfully, or ineffective strategies (fixation, translation) were utilised. Mainly low-scoring listeners encountered these problems rather than high-scoring ones (although there were just two), and they showed a few higher-level processing problems. Almost all low-scoring listeners, although they attempted to understand the lectures, had problems with lower-level processes, e.g. parsing continuous utterances and constructing the meaning of an utterance semantically, which then led to problems with higher-level

processes, including associating different pieces of information to keep up with a main point expressed in a section and ending up with a coherent meaningful construction of the lecture. Therefore, for certain listeners, particularly low-scoring participants, it can be concluded that they have limited knowledge on how to listen in terms of engaging in cognitive processes and strategy metacognitive knowledge. Finally, although Field (2012) argues that studying effective listeners' behaviour can lead to understanding the processes underlying the listening construct, the phase 2 analyses revealed that unskilled listening can also indicate the academic listening processes required.

Chapter 6 Interview analyses (Phase 3)

6.1 Introduction

This chapter presents Phase 3 of the study, covering semi-structured interviews with five lecturers and three students to answer *RQ1**d***: 'What do lecturers perceive to be the target, present and language-learning academic cognitive listening needs of ELL undergraduates?', and partially answer *RQ1**e***: 'What do ELL undergraduates themselves perceive to be the target, present and language-learning academic cognitive listening needs?'.

Section 6.2 describes Phase 3's methodology and Section 6.3 the findings. Finally, the chapter is summarised in 6.4.

6.2 Data collection and analysis

6.2.1 Conducting semi-structured interviews

Long (2015) specifies that interviews are widely used for ESP NAs. In L2 listening, Vandergrift (2015) notes that interviews can gather data about listeners' decision-making processes during comprehension. For example, Graham (2006) utilised a semi-structured interview designed based on questionnaire findings to investigate listening comprehension difficulties.

Kvale (1996) defines interviews as an interchange of views/opinions between at least two individuals on a specific topic, emphasising the centrality of human interaction for knowledge production. They differ from everyday conversations in that, according to Cohen, Manion and Morrison (2007) and Kvale (1996), interviews have specific purposes and structures, which the interviewers primarily control. The participants have different roles; the interviewer carefully asks questions and listens to the interviewees' responses, which should be as explicit and detailed as possible so that the interviewer can obtain thoroughly tested knowledge (Cohen et al., 2007; Kvale 1996).

Interviews can take a variety of forms according to a pre-determined structure and the number of participants (Dörnyei, 2007). For example, there are: focus-group interviews and individual ones, as well as structured interviews, in which the interviewer closely covers a prepared set of questions; unstructured interviews, in which the interviewer does not predetermine the content but decides on questions during the interview; and semi-structured interviews, in which the interviewer asks questions determined in advance but also deviates from them to follow up on interesting remarks. In this study, I utilised semi-structured interviews for Phase 3. This format was thought suitable because some insights had already been gained from Phases 1 and 2 and thus some topics could be specifically targeted in Phase 3, but the picture was not comprehensive yet so unanticipated information might be revealed. Phase 3 thus forms a halfway position between the unstructured Phase 1 and the structured Phase 5.

Morgan (2014) argues that the interview strength lies in its 'dual subjectivity' (p.54), as it emphasises the participants' beliefs and increases the researcher's understanding of the research topic as s/he tries to make sense of the data. Nevertheless, several pitfalls regarding interviews have been identified. Interviews can be time-consuming, often requiring 30–60 minutes per participant (Dörnyei, 2007). Also, data obtained from interviews can be subject to bias during data collection, as participants may say what they think the interviewer expects or the interviewer asks leading questions; or during data analysis, the researcher may interpret data according to his/her own perceptions (Long, 2015). However, Edwards and Holland (2013) argue that leading questions may not necessarily influence interviewees' responses as 'interviewees are perfectly capable of telling' (pp.73-74) that something included in the question is not what they think. They also note that researchers can verify data, such as by comparing what a participant says with official records or with what other participants say (triangulation). Researchers can also increase the trustworthiness of analysis by having at least two researchers double-code a data sample to ensure that the coding is accurate (Arksey & Knight, 1999). Additionally, as Long (2015) states, interviewers and interviewees sharing the same race, cultural background and gender – which was the case in this study – might help ensure collecting good data.

Interview guide

Preparing for the semi-structured interviews involved designing a guide that was organised into three parts – TSA, PSA and LCSA, which correspond to this study's NA approaches (Appendix J). The first two parts included general questions aiming to explore lecture-listening experiences and specific questions about topics emerging from Phases 1 and 2. A 'funnelling' method was used – general to more specific – to structure questions (Minichiello, Aroni, Timewell, & Alexander, 1990, p.116). The last part contained questions based on the LCSA approach; data were not gathered for this approach previously. All parts required 'unstructured responses' (Cohen et al., 2007, p.359). The contents of these parts are described below.

1. Part I aimed to identify *target needs,* including questions about: how to listen to lectures in the ELL department in order to derive the most benefit; the lecture's main objectives; how lectures are useful to students; how information from lectures can be used; what makes a good listener in class; how listeners can prepare mentally for listening; and aspects of lectures to which listeners must pay attention. Subsequently, I asked about sub-skills and whether listeners need these to follow a lecture, which include; recognising the lecture's organisation in terms of topic, central points, supporting details, examples and conclusion; English proper nouns; recognising phonological features (e.g. stress); understanding phonological features in, for example, phonology classes (only for linguistics lecturers); abstract ideas, as in metaphors (only for literature lectures); writing on the board; and relating preparatory reading to listening.
2. Part II aimed to establish *present needs* via questions regarding: how well they think lectures are understood; why some students get low grades in exams and whether or not problems understanding lectures play a role; and determining problems through activities such as quizzes/assignments to show listening problems. Next, I asked them to comment on specific difficult sub-skills, including understanding certain points but having difficulty integrating information to form a complete understanding; relating to background knowledge; recognising redundancy (synonyms, paraphrasing); understanding students' speech; attention and concentration problems; amount of

information; quickly relating lecturers' speech with written materials; and seeing how a lecture relates to a future activity (e.g. exam).

3. Part III aimed to establish *learning needs* by asking about: whether or not students are aware of their academic listening ability; students' willingness to improve their listening; the greatest listening needs for learning; and the best way to teach listening.

Piloting

The guide was piloted with two informants - one with a master's degree in English literature and one pursuing an MA in Phonology. These informants had previously worked in the ELL programme for a year as teaching assistants and had graduated from the same department. I interviewed them together for approximately 100 minutes. The initial plan was to interview only one of them; however, as they are friends and arrived together, I interviewed them concurrently to save time. When asking questions, I had them answer them one at a time. Their responses were based on their experiences as staff members and former students. Accordingly, some modifications were made to the guide as it became clear that not all findings drawn from previous phases could be included. Due to time constraints and to avoid interviewee fatigue, I prioritised certain points and discarded issues that emerged from previous phases, such as: recognising words, sounds, complex grammar; relating subject-specific knowledge; using slides; understanding pronouns; difficulty in catching words already known; understanding the speaker's intent; relating a translated word to the surrounding text; listening to single words; mental translation; and recognising multiword phrases, issues which I felt I had already gained a lot of information on during previous phases.

Participants and procedure

To conduct the main study interviews with staff members, I approached three linguistics lecturers and one literature lecturer based on a referral from the Head of Department and contacted another lecturer who delivered a lecture I used in Phase 1 in order to include another literature lecturer teaching at a higher year of study. As Table 6-1 shows, these lecturers covered a variety of subjects, and levels and years of study.

Table 6-1: Bio-data of lecturers interviewed

No	Specialism	Interview length in mins.	Nationality	First language	Highest degree	No. of years working as a lecturer	Levels taught (study year)	Subjects taught
L1	Linguistics	76:00	Saudi	Bilingual	Doctorate (USA)	4	7,8 (3)	Syntax/Composing research
L2	Linguistics	60:00	Saudi	Bilingual	Master's (UK)	8	3,4,6 (1+2)	Phonetics/Phonology /Sociolinguistics
L3	Linguistics	59:00	Saudi	Arabic	Master's (UK)	7	3,5,6 (1+2)	Morphology/Language acquisition/Applied linguistics
L4	Literature	76:00	Saudi	Arabic	Master's (USA)	9	4,5,6 (1+2)	Romantic poetry/American literature/Literary criticism/Advanced translation
L5	Literature	36:00	Egyptian	Arabic	Doctorate (Egypt)	25 (9 at KSU)	6,7,8 (2+3)	British Victorian novel/Modern British novel/Modern literary criticism

To recruit participants for the student interviews, I randomly emailed some students who had provided me with their contact information in Phase 2. Three agreed to participate, each from a different level and year of study (Table 6-2). Five lecturers and three students were hoped to be sufficient because I had already gained lots of insights from the students via the stimulated recalls (Phase 2) and the lectures via discourse and corpus-based analyses (Phase 1).

Table 6-2: Bio-data of students interviewed

No	Interview in mins.	Age	First language	Year/Level	English-speaking country experience	IELTS Listening Score (40)
S1	73:00	22	Arabic	Y1/L3	3 years in the UK	25
S2	63:00	22	Arabic	Y2/L5	1 year in Australia	18
S3	103:00	23	Arabic	Y3/L8	None	18

The individual interviews with lecturers were conducted in their offices, whereas student interviews took place in a language lab. Before the interviews began, information sheets were given, consent forms were signed and background questionnaires were completed. A single guide (Appendix J) was used for lecturers and students; questions were asked in the same order; however, if a participant discussed an issue that I later had a question about, I would not repeat my question.

Interviews were audio-recorded. Lecturers spoke in English, whereas students spoke in Arabic. An example of an interview transcript can be found in Appendix K.

Coding

The interviews were transcribed verbatim, excluding false starts and pause fillers, as suggested by Arksey and Knight (1999), since the analysis focuses on content meaning rather than how views are expressed. As Roulston (2014) emphasises, generating codes and categories should be based on a firm prior theoretical understanding of the topic. Yet Roulston (2014) also notes that researchers should also be 'open to what is in the data' (p.305) and not just depend on concepts drawn from the literature. Therefore, the interview data were analysed qualitatively using a coding scheme consisting of seven main categories (i.e. lower- and higher-level cognitive processes) and each process was sub-divided into sub-skills; there is also a category for cognitive and metacognitive strategies (Appendix G). This scheme is based on several frameworks (Field, 2013; Khalifa & Weir, 2009; Aryadoust et al., 2012; Young, 1994; Vandergrift & Goh, 2012) (see 2.3.3).

To code the data, I imported the transcripts into Atlas.ti and then allocated codes from the coding scheme; these codes were originally sourced from this study's model (see 2.3.3), e.g. following a lecture's structure, integrating information from multiple texts, note-taking and understanding accents. I also developed additional codes that emerged directly from the interview data, e.g. understanding technical words, fast speech and unfamiliar ideas, as well as connecting the current lecture to the next. Lastly, I made decisions on how to code listening strategies. Selective attention as a metacognitive strategy—i.e. requiring a listener to notice specific parts in the input such as repetition, structure, intonation, discourse markers, intonation, familiar content words, and words in a group (Goh, 2002)—was not included. This is because there is overlap between this strategy and the two listening processes of building a mental model and input decoding, which are cognitive in orientation. Building a mental model as a cognitive process involves identifying and noticing specific aspects in the input such as main points, anaphors, and discourse markers, whereas input decoding as a cognitive process involves a listener recognising the phonological representation of words and paying attention to intonation and prosody. Selective attention generally captures these sub-processes in one strategy. However, this study

focuses more on what a listener does automatically while listening to a lecture, linking these sub-processes and categorising them according to the automatic processes of listening rather than listening strategies. As indicated in the literature (e.g. Vandergrift and Goh, 2012), strategies are in fact cognitive processes. However, when used in a conscious controlled manner to manage and assist comprehension they are considered to be strategies, particularly in the case of L2 linguistic deficiency (Goh, 2002). As Grabe (2009) mentions, strategies are also on their way to becoming automatic processes and sub-processes. Additionally, elaboration as a strategy differs from the inferencing sub-skill of linking input to world knowledge that is already part of the core lecture. But when a speaker refers to (or a listener uses) something from the listeners' prior experience/world knowledge that is not part of the content, this is considered to be an elaboration strategy used to facilitate understanding. It should be noted that the coding process was not linear but cyclical, as codes, titles and definitions were amended and refined until I arrived at the list in Appendix G.

I first coded the lecturers' interviews by using 'process coding' (Saldaña, 2013). I inferred what sub-processes listeners need to engage in, or fail to engage in, and linked these issues to suitable codes, and I sometimes linked a quote to more than one code using 'stimulus coding' (Saldaña, 2013). For example, in the text in Figure 6-1 the lecturer noted how new students focus on single words while listening. This was coded as 'listening to single words' and considered a present need. Another example, (see Figure 6-2), highlights: the codes 'understanding technical terms', 'note-taking' and 'noticing prosody' as target needs; 'difficulty in making judgements about the importance/unimportance of information' when the lecturer said some listeners do not realise that a technical term they hear is an important word; and 'difficulty noticing prosody', when stress is used to reinforce a point but is not recognised. These last two are considered present needs.

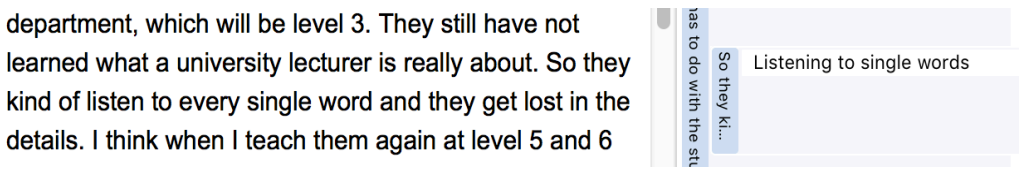


Figure 6-1: A code example in Phase 3

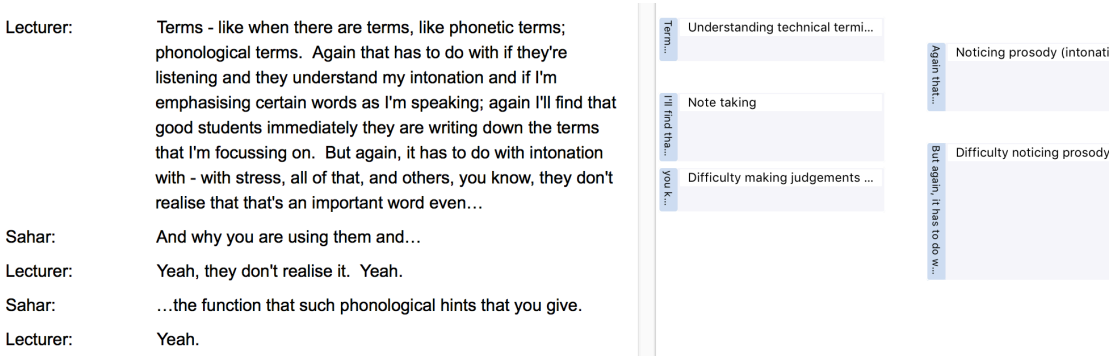


Figure 6-2: Multiple codes in Phase 3

I also found that some participants expressed having no problem with a specific sub-process; this was coded as 'no problem with…' for the purposes of this chapter. Further, while coding learning needs, I used 'descriptive coding' (summarising the idea of the quote) (Saldaña, 2013). Of note is that participants spoke about some sub-skills (covering target or present needs), but these were given a single code for learning needs so as not to mix learning needs with present or target needs, as Figure 6-3 illustrates.

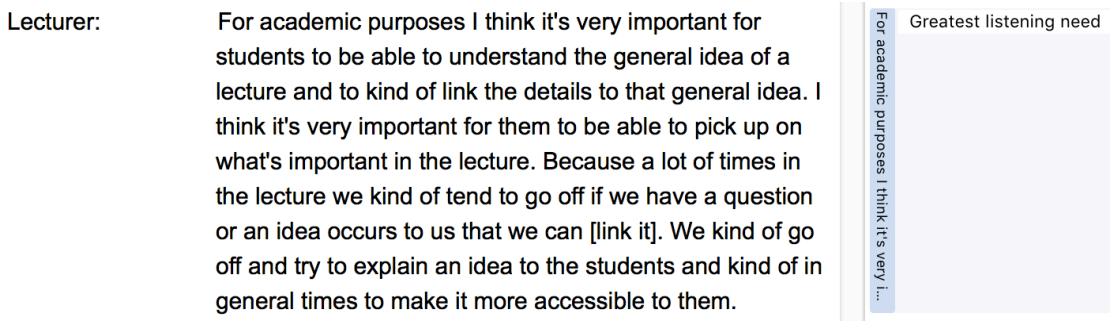


Figure 6-3: A descriptive listening-learning code in Phase 3

Subsequently, I coded students' interviews; the process was relatively straightforward as most of the codes from the lecturers' interview analyses applied. Also, during the coding process, the same external coder from Phase 2 double coded two interviews for Phase 3 using the coding scheme. The inter-rater agreement was 93.27%.

6.3 Interview findings

Overall, the analyses of lecturers' and students' interviews reveal that, between interviewed lecturers, there were 41 sub-skills that listeners are thought to need to process ELL lectures efficiently, while between interviewed students, there were 29

sub-skills. Further, lecturers spoke about 30 sub-skills certain listeners may find difficult, while students mentioned 19. These sub-skills are linked to lower-level and higher-level processes (see 2.3.3). The analyses also suggest that there are three metacognitive (pre-listening preparation, directed attention, comprehension monitoring) and five cognitive (fixation, translation, inferencing, prediction, elaboration) strategies that listeners need to activate or already used. Additionally, views on language-learning wants varied between the two groups of participants; for example, lecturers said only a few students are aware of their listening ability, whereas all interviewed students said they are aware.

Below, subsections 6.3.1 and 6.3.2 provide more detailed findings of the perceived target and present needs regarding lower-level and higher-level processes. Listening strategies and learning wants are described in 6.3.3 and 6.3.4, respectively. These findings are illustrated with quotes and frequencies of mentions.

6.3.1 Lower-level cognitive listening processes

Lecturers and students gave their opinions on lower-level TSUA and PSA listening needs, including input-decoding, lexical searching and parsing.

1. Input decoding

Target needs

As shown in Table 6-3, the lecturers reported six input-decoding sub-skills for listeners to use, while the students only reported three.

Table 6-3: Input-decoding – target needs

Total	L*1	L2	L3	L4	L5	Sub-skill	S*1	S2	S3	Total
14	2**	3	2	7		Decoding other speakers' speech				
12	1	7	2	2		Perceiving prosody (e.g. stress)	2	1	1	4
4		1		3		Recognising interrogative questions				
3		2		1		Decoding fast speech				
2		2				Understanding different accents in English			1	1
2		1	1			Recognising words' pronunciation	2	2	2	6

*L=Lecturer, S=Student

**The number of times a person mentioned this need (each time about a different situation).

The lecturers discussed some situations that come up in their lectures whereby listeners may be required to decode the input of other students' speech such as when a

student reads a written text aloud or during discussions, as illustrated by the following excerpt:

Quote/6.1
'I do have a bit of leeway in one of my courses when there's a bit of a discussion.' (L3)

While it is useful for students to understand each other, the decoding of their speech may not be essential according to the lecturers, as it might result in a kind of cognitive overload when listening to speakers other than the professor, as this quote demonstrates:

Quote/6.2
'It doesn't bother me, honestly … they don't feel it's very applicable to them. … I don't find that particularly problematic … Just, given our circumstances – too many students in one class, too many levels in one class – it's just too much to expect of students to be as attentive as we want them to be.' (L1)

Four lecturers also thought that listeners should perceive prosody and its functions (e.g. stress, intonation) in words or utterances encountered in two scenarios: when prosody is part of a linguistics core lecture (e.g. phonology, phonetics, morphology), and when it is in the lecturers' voices when speaking normally, as speakers can express additional attitudinal meanings beyond an utterance's linguistic content:

Quote/6.3
'Because we actually take these individual chapters in my phonetics and phonology courses anyway … we take stress, simple stress, complex stress; we cover intonation, we take phonological processes.' (L2)

Quote/6.4
'When I want to draw their attention to an important point without telling them that it is important, I just stress the point. I might just say, notice what William Blake said [stressed]. Then I say the point... .' (L4)

Likewise, all three students believe that prosody is something they need to discriminate, as this quote illustrates:

Quote/6.5
We need to pay attention to the voice in general, both intonation and stress … like when a lecturer talks about a funny character and gets excited about it, that attracts my attention. (S2)

Additionally, recognising the role of interrogative questions and differentiating them from, for example, rhetorical ones or other utterances was regarded as an ability that listeners need to activate:

Quote/6.6
'They realise that a rise in intonation will more likely have a question form rather than – they already naturally do it… .' (L2)

Two lecturers commented that listeners should become accustomed, although not always, to many speeds of speaking (particularly fast speech), as well as to listening to and understanding different English accents, such as British and American (which, again, may be part of a phonology course; this was also mentioned by one student):

Quote/6.7
'I tend to speak in a fast way. It's my nature… .' (L4)

Quote/6.8
'When it comes to phonetics and phonology, it deals a lot with pronunciation, the differences between American and British pronunciation.' (L2)

According to two lecturers, listeners should identify the correct pronunciation of words that are heard quickly in connected speech, and even recognise the pronunciation of specific phonemes:

Quote/6.9
'It is very important … to understand every single word that we're saying and to recognise it and pick up on the sounds.' (L3)

Quote/6.10
'For example the correct pronunciation of the plural 's' or past tense 'ed' or whatever it is' … we teach them that the plural 's' has three different ways to pronounce it like… .' (L2)

Similarly, all three students emphasised that speakers should pronounce words clearly because they feel the need to discern words in connected speech, as well as to learn the proper pronunciation of a word, for example:

Quote/6.11
'The first, the most important thing is that the voice of the teacher is loud and clear so we can really understand what she is saying, pronunciation [should be] very clear.' (S1)

Present needs

The lecturers mentioned six input-decoding problems, whereas the students only mentioned three (Table 6-4).

Table 6-4: Input-decoding – present needs

Total	L1	L2	L3	L4	L5	Sub-skill	S1	S2	S3	Total
9	2	1	2	4		Decoding problems in general		2		2
7	1	2	3		1	Decoding other speakers' speech	1	1	1	3
4		2	1	1		Perceiving prosody + understanding only emphasised information + misunderstanding a question's role		1	2	3
3		1		2		Decoding fast speech				
2		1		1		Understanding different English accents				
4			4			Listening to single words				

Four lecturers mentioned that they occasionally repeat what they say, as they feel that some listeners may be unable to process incoming stimuli immediately at the first mention; this is most likely due to weak language proficiency or being new to a discipline suggesting ineffective input-decoding:

Quote/6.12
'But I have to address the needs of the lower proficiency students. In order for me to make sure I'm carrying everyone along with me as I'm moving from one point to another, I find myself having to repeat again and again until I see that glimmer, that click of understanding... .' (L1)

One student stated their desire to see a word written out, along with its pronunciation, in order to better understand it; this may, again, suggest a decoding problem.

Quote/6.13
When Miss X was talking, she was writing on the whiteboard a lot, I feel then I assimilate [content] more and I can remember easily what has been discussed. (S2)

Four lecturers thought that certain listeners may not be interested in, or fail to decode, other students' speech:

Quote/6.14
'They start … asking: what is she saying, what is she talking about? ... Or they just lose their attention.'(L5)

Indeed, all three students expressed having difficulty listening to other students, due to their classmates' language proficiency (which may be higher or lower than that of

the listener). Further, when a student provides input in a way that is unclear, their viewpoint may be erroneously perceived (by other listeners) to be less important than that of the lecturer.

Quote/6.15
Some students speak in an academic style, they use more academic words, so a listener with a lower proficiency level might not understand them … I myself have no problem with that but I noticed it … but sometimes when students themselves do not know how to convey what is in their mind, that might be problematic for me. (S1)

According to three lecturers, listeners may struggle with prosody. As they put it, listeners may not easily distinguish the phonetic features of the different phonological processes (e.g. assimilation, epenthesis) that form part of the content of linguistics lectures. Further, certain listeners may pay more attention to utterances that are phonetically stressed by the speaker than, say, other utterances that receive less stress. Finally, some listeners, albeit rarely, might misunderstand a rhetorical question's role. Each of these issues is illustrated in the following excerpts:

Quote/6.16
'I can give you a specific example. There are two different lessons that I give students in phonology – one on phonological processes, like assimilation, dissimilation, epenthesis – all of these are okay – and one specifically on diacritics. … Now some of the phonological processes have diacritics, like patholisation, aspiration, nasalisation, all of these – and when I came to ask them a question … I had a problem as they just ended up – they brought two of the lessons together… .' (L2)

Quote/6.17
'Sometimes students may understand better points that are emphasised by the instructors and points that are emphasised separately… .' (L4)

Quote/6.18
'I once asked a rhetorical question and then I had students replying with research papers. They took it too seriously, it was just a random question [comment] that I made. … But when I do that, students can usually pick up on it.' (L3)

While one student mentioned their ease in recognising prosody, particularly within a phonology lecture, the other two did express such a difficulty:

Quote/6.19
We study [for example] stress, and I understand that this can change the meaning. However, if I have still not understood them? I sometimes say yes, but

sometimes no! … Probably because I always hear the pronunciation the same way, especially if words have the same spelling and different positions for stress. (S3)

According to two lecturers, certain listeners may struggle with extremely fast speech and unfamiliar accents, such as an American accent, or those that are otherwise different from their L1 background:

Quote/6.20
'Now, on one of the evaluation forms that I gave my students some of them said .. Sometimes you speak too fast or … .' (L4)

Quote/6.21
'…and since we have non-Saudi lecturers, some students feel that their accents may cause some kind of misunderstanding … Sometimes in linguistics courses when they are asked to transcribe something, it's kind of tricky because the way you pronounce the word is … When you have an accent while speaking it's kind of – it won't be clear for the students.' (L4)

Finally, one lecturer observed that certain listeners, especially those who are new to the programme, listen to every individual word:

Quote/6.22
'She would focus on every single word and forget what the whole picture is. She wouldn't listen to the sentence, because she's just focusing on [the words]… .' (L3)

1. Lexical search

Target needs

Table 6-5 shows six sub-skills for lexical searching that were mentioned by lecturers and five mentioned by students.

Table 6-5: Lexical search – target needs

Total	L1	L2	L3	L4	L5	Sub-skill	S1	S2	S3	Total
8	1	2	1	4		Noticing proper nouns	1			1
6	2	1		1	2	Understanding technical words		1		1
4			1	2	1	Accessing word meanings			2	2
3	1	1		1		Understanding technical definitions			1	1
2		1		1		Understanding synonyms				
1		1				Noticing key words	1		2	3

According to four lecturers, students encounter English proper nouns. In this regard, listeners must recognise proper nouns and connect them to surrounding information.

Nevertheless, it seems that usually, in this situation, when a proper noun is mentioned for the first time, it comes with some explanation of what it is referring to, as students might otherwise not recognise it as a name or title. However, if a name has been mentioned in previous lectures, listeners are expected already to be aware of it and related information, as this quote shows:

> ***Quote/6.23***
> 'Usually when I refer to a work I assume that they have already dealt with the work as part of the plan. Or if I'm referring to a work that is not part of the curriculum I just say that it's a poem, for example a contemporary poem, or this is a contemporary author. But that's true, they need to know, especially since this is not their own culture... .' (L4)

Conversely, one student did not seem to consider that proper nouns were of particular importance when processing a lecture:

> ***Quote/6.24***
> I don't care about that. I feel they are unimportant if they are brought up. (S3)

Also, listeners ought to understand technical words heard in both linguistics and literature lectures, which are sometimes clarified by definitions or glossaries:

> ***Quote/6.25***
> 'With syntax, we deal with a lot of technical words. So with that technical terminology, we usually give definitions. You would do that with first language speakers of English anyway… .' (L1)

One student emphasised that she has to recognise technical terms and take note of their meanings as they are provided, as translating complex terms outside the lecture might result in incorrect meanings:

> ***Quote/6.26***
> On the slides I print I add notes. For example, during the British survey class, there is odd terminology such as blank verse … When I translate such terms I do not get the exact meaning. So, I have to understand Miss when she explains/simplifies it in English. (S2)

Three lecturers and one student commented on the importance of accessing word meanings (for non-technical words), for example:

Quote/6.27
'So sometimes I use very sophisticated words, but it's what the occasion necessitates.' (L4)

On that note, listeners might encounter synonyms, which can help them to interpret difficult words:

Quote/6.28
'Sometimes my expectations are way too high and I use very advanced words. Then I realise when I see the perplexed looks in their eyes, I just switch and change the word, I use another synonym for the word.' (L4)

Finally, one lecturer said that she selects key words from her statements and writes them on the whiteboard. Listeners then have to work out and recognise the vital meaning that these words lend to a certain utterance or the lecture as a whole:

Quote/6.29
'I write things on the board – key words or anything that – like small notes.' (L2)

Two students also said that they listen out for key words, as such words may explain the surrounding meaning to the listener as well as prompt them to include them when writing, say, a short answer in an exam:

Quote/6.30
I always focus on key words, always! You know that, when she emphasises a certain word, I know the lecturer wants to see this word in the exam … she will always repeat it. For example, a lecturer was discussing the philosopher [Sir Philip] Sidney who said that poetry moves the person to do virtuous actions … TO MOVE, this word is associated in my mind with Sidney because he is the only one who used this word … this is a technique I use, key words can 'control' the whole meaning. (S3)

Present needs

Table 6-6 shows that the lecturers mentioned three lexical search problems, while the students mentioned two.

Table 6-6: Lexical search – present needs

Total	L1	L2	L3	L4	L5	Processing sub-skill	S1	S2	S3	Total
9	1	3	1	4		Accessing vocabulary				
6		1	1	2	2	Recognising English proper nouns			2	2
2	1	1				Understanding technical words	1	2	1	4

Four lecturers mentioned that certain vocabulary can be an obstacle, for example:

Quote/6.31

'We just had a spelling bee that we announced and I realised when I talked about it that they didn't know what a spelling bee was … with those vacant looks – you can tell from their eyes that comprehension didn't register.' (L1)

Additionally, certain listeners may struggle with recognising the role of a name or to recall unfamiliar proper nouns (based on what a lecturer has seen in exams), and might even confuse them with regular words, for example:

Quote/6.32

'I've taught translation before where we have had students translate names because they did not recognise that it was the name of a place, or it was the name of a person, because it just looks like a regular kind of English word. … in modern linguistics we usually deal with the names of scientists and the names that we use in examples are usually pretty standard John and Mary.' (L3)

Although two students said that they had no problem recognising nouns, the remaining one expressed difficulty recognising unfamiliar nouns, particularly those that are similar in pronunciation, such as John, James and Jane, but this did not apply to familiar ones:

Quote/6.33

If I studied the name before I would know it, like Shakespeare, but if it's new I have to infer! … I confused the names of the characters in a novel, they were John, Jane and James. Later, I realised that they are not the same. (S3)

Finally, technical words may sometimes be a hurdle, particularly those that do not have literal translations/equivalents in the listeners' L1, or terminology that students encounter at the beginning of their studies.

Quote/6.34

'So they're not as clear when I'm talking about quantitative analysis or qualitative analysis. They don't have another Arabic word to fall back on.' (L1)

Likewise, all three students said that it is sometimes difficult to discern technical terms and understand their meanings. As one student put it, the professor has to recall and identify them to allow listeners to notice these technical words:

Quote/6.35
I sometimes do not understand a term despite the fact that I hear it a lot … like syntactic category. I understood only when it was explained to us … I feel it is important that the lecturer specifies it and tell us its meaning because she only sometimes tells us this. (S1)

2. Parsing and propositional meaning

Target needs

Concerning parsing, the lecturers reported one sub-skill (Table 6-7).

Table 6-7: Parsing and propositional meaning – target needs

Total	L1	L2	L3	L4	L5	Sub-skill	S1	S2	S3	Total
6	1	1	3	1		Linking what is heard to syntactic knowledge				

As four lecturers put it, linking information to English syntactic knowledge can be essential, particularly when processing linguistics (syntax, morphology, phonetics) and translation lectures, such as when syntactic trees are constructed in a syntax lecture as this excerpt shows:

Quote/6.36
'So for example, the content material objectives of syntax are for them to be able to parse a sentence in English, for them to be able to identify the major parts … having once identified the major parts, to translate them graphically into a syntactic tree, to be able to talk about that tree using syntactic technical terms.' (L1)

Present needs

As Table 6-8 shows, lecturers stated two sub-skills that may indicate inefficient parsing and establishing a propositional meaning, while one student stated one.

Table 6-8: Parsing and propositional meaning – present needs

Total	L1	L2	L3	L4	L5	Processing sub-skill	S1	S2	S3	Total
3		2		1		Processing complex syntactic structures			1	1
23	1	8	4	6	4	Weak language proficiency				

Complex grammatical structures might also negatively affect understanding, which can then prompt lecturers to use simple structures to avoid confusion:

Quote/6.37
'…like even our structures, like sentence structures; like they're complex because we're in university. … And they want us to simplify… .' (L2)

Finally, all five lecturers regarded listeners' poor language proficiency as an important characteristic that can have a negative effect on their lecture-listening in general, for example:

Quote/6.38
'…since English is not their mother tongue, it's a language barrier. They have this problem with language.' (L4)

6.3.2 Higher-level cognitive listening processes

The lecturers and students also made comments on TSUA and PSA related to higher-level processes, including inferencing, building a mental model, creating text-level and intertextual representations.

1. Inferencing

Target needs

Table 6-9 shows four inferencing sub-skills that listeners should engage in, according to five lecturers and two students.

Table 6-9: Inferencing – target needs

Total	L1	L2	L3	L4	L5	Sub-skill	S1	S2	S3	Total
12	5	5		2		Recalling information from the same lecture to understand another point			2	2
7			3	2	2	Linking what is heard to background world knowledge			2	2
4		1		3		Predicting questions' answers				
6			3	3		Understanding explicit information + processing complex concepts	1		1	2

It seems to be essential that listeners engage in recalling information (that was already given by the speaker and processed by the listener in the same lecture) to process another part of the message, as three lecturers and a student believe. This may occur when a listener is required to perform exercises as part of the lecture, or when relating specific points in the middle of a lecture to a general idea presented at the beginning, for example:

Quote/6.39

'They have to apply what they are listening to actually right there and then, in real time, to their sentence examples. ... So they're really listening intensely for the first ten minutes when we're doing a sample or when we're explaining or revising the main ideas that we want to make sure we implement. So they're taking instructions from the class.' (L1)

Quote/6.40

'I explain the poem after talking about it in general. I explain it stanza by stanza, and at the end of each stanza I ask them if there any features of romantic poetry, if there is anything significant that we can relate to the background.' (L4)

It also seems that there is a need to think about information based on general world knowledge (e.g. history) and connect it appropriately to what is being said:

Quote/6.41

'Literature is an interdisciplinary kind of discourse. … It's related to life. Everything, any – there is a way of relating. Even metaphors, even imagery, figures of speech. … With regard to the, as I said, other branches of humanities, general information, historical, political, religious, sometimes even information in philosophy, knowledge of philosophy even.' (L5)

Listeners may need to predict questions' answers by inferring implicit information from what is explicitly stated:

Quote/6.42

'…by asking questions, and usually I ask a true or false question. Do you think this is correct? What do you think of this situation – not this situation – what do you think of this particular information?' (L3)

However, one lecturer indicated that it might not be necessary to infer information because most content, in her lectures, is elucidated explicitly:

Quote/6.43

'I'm pretty explicit and pretty straightforward.' (L3)

It also appears that listeners need to process complex utterances to obtain representations of the propositions of ideas without the interpretative and associative factors a listener might bring to interpretation through inferencing:

Quote/6.44

For example, during the criticism class, there is nothing logical/intellectual but you should open your mind up. You need to grasp the concepts of philosophers such as Aristotle and Plato according to the philosophers' own ways of thinking… . (S3)

Present needs

Table 6-10 shows three inferencing problems mentioned by the lecturers and two stated by a student.

Table 6-10: Inferencing – present needs

Total	L1	L2	L3	L4	L5	Sub-skill	S1	S2	S3	Total
6		3		2	1	Linking information that is not part of their world knowledge			3	3
1				1		Predicting answers to questions				
6	2		2	2		Processing complex concepts			1	1

According to three lecturers and one student, a problem that may face certain listeners is difficulty making a conscious effort to generate 'elaborative inferences' (Imhof, 2010) to arrive at a detailed mental representation. This is due to their lack of appropriate general world knowledge which, in turn, may cause the speaker to digress and provide some explanation, since such listeners cannot do so internally. An example is unfamiliarity with public figures such as Margaret Thatcher and Hilary Clinton, as this quote illustrates:

> ***Quote/6.45***
> 'We have an example with sociolinguistics. We're talking about … like age and gender and we're talking about the gender of Margaret Thatcher. She had to take lessons to deepen her voice … and they didn't know who Margaret Thatcher was. So like what we try to do is – again they're from different societies … and we can't come – you would find a lot of students, they get it, they understand, but we can't expect them all to, so what we should do, and what we try to do, is not only do we explain who these people are – Martin Luther King and even political figures that they should already know – like some students didn't know who Hilary Clinton is.' (L2)

Predicting answers to questions from the same lecture may be difficult:

> ***Quote/6.46***
> 'For example I ask questions and they answer them and somehow it is a very irrelevant answer.' (L4)

Sometimes a listener may need to revise their general knowledge and ignore real-world facts to make sense of a described event that is beyond their knowledge base (Zwaan & Rapp, 2006), such as a concept presented in the context of supernatural images. However, certain listeners may fail to accomplish this, as this quote shows:

Quote/6.47

'…it is still somehow confusing to them and this tells me that there is a serious problem ... Like I was explaining to them a poem by Coleridge, *Kubla Khan*, and I was telling them that Coleridge loves to adopt shocking images like the – we were going nicely and the poem was going very smoothly and the image of nature was a very bright image. Then suddenly we were introduced to the image of a woman who is wailing for her demon lover. … They could not relate to it. But again it was presented in the context of supernatural images. (L4)

2. Building a mental model

Target needs

Regarding building a mental model process, Table 6-11 shows seven sub-skills needed by listeners when processing lectures, of which students mentioned five.

Table 6-11: Building a mental model – target needs

Total	L1	L2	L3	L4	L5	Sub-skill	S1	S2	S3	Total
13	3	1	4	2	3	Making appropriate judgements about the quality of information while listening			1	1
15	2	3	4	4	2	Recognising paraphrasing (discerning old from new information)	1	1	4	6
9		3	6			Using examples to infer/deduce the meaning of a key, detailed, relevant point			2	2
10	2			3	5	Identifying key points	1			1
6	3		2	1		Identifying details	1			1
4	1	1	2			Identifying and rejecting peripheral information				
1	1					Recognising key points at the outset				

According to all five lecturers (and one student), it is essential that listeners make appropriate judgements about the information contained in a message in a way that will help them separate relevant points from irrelevant ones. Such a sub-process ensures that there is no need to attach equal importance to all the information received during such a lengthy discourse. This can be achieved by, for example, carrying out relevant reading prior to a lecture, or paying attention to the speaker's variations in stress, pitch or tempo. The lecturer may also emphasise certain information by repeating it, or explicitly highlight it by saying 'pay attention to this', for example:

Quote/6.48

'I think it is necessary just to know at which points in the lecture I need to be really alert and at which points I can zone out a little bit.' (L1)

Another target sub-skill mentioned by all the lecturers is that listeners must discern paraphrasing, that is, 'new points versus continuing points' (Field, 2008a, p.248). In general, all the students involved thought that redundancy helped in the reinforcement of information they were trying to understand. One lecturer said:

Quote/6.49
'Depending on the kind of looks I'm getting, in some instances, I just move right along, because I feel like they're with me every step of the way. Other times, I feel like I have to fall back on a paraphrase… .' (L1)

It also seems that examples are used to illustrate points. Accordingly, listeners may need to apply inductive (from concrete to more abstract ideas) or deductive thinking (from a general point to a specific example) (Powers, 1986), for example:

Quote/6.50
In a discourse analysis class, the lecturer discussed how to address the president of a country. She said that we use a number of titles to address our president, whereas in the United States, not so many titles are used. She provided this example and left us to identify by ourselves the point she wanted to make. (S3)

It is considered that the need to recognise key points (whether a lecturer does not state them explicitly, presents them on slides or mentions them at the start of a class) and associated details requires concentration on those specific elements of a lecture. Further, peripheral information must be rejected as lecturers often bring in unrelated information; while this may be intended to facilitate the understanding of the core meaning, these aspects need not be focused on and should not be confused with key points. The following excerpts illustrate these issues:

Quote/6.51
'I would like them to skim and scan, look for the most important key words, the main ideas of what I'm delivering or what I'm telling them.' (L5)

Quote/6.52
'You have so many points [details] in it [argument].' (L3)

Quote/6.53
'Because sometimes I'm just talking about a story to kind of relate the idea, so they can filter that out.' (L3)

Quote/6.54
'Usually the first ten to 15 minutes is where it's just really concentrated, where I basically elucidate the core of what I want to deliver that day… .' (L1)

Present needs

Five problems related to building a mental model were commented on by lecturers, and three were mentioned by students (Table 6-12).

Table 6-12: Building a mental model – present needs

Total	L1	L2	L3	L4	L5	Sub-skill	S1	S2	S3	Total
11	1	3	5	1	1	Making appropriate judgements about information while listening	1	1	2	4
5			3	2		Co-discovering relationships between different ideas while listening	3	2	1	6
3			1	2		Recognising details		2		2
2			2			Recognising paraphrasing				
2		2				Using examples to infer/deduce the meaning of a key or detailed point				

It may be hard to determine which points are important for understanding and which are not, as stated by all five lecturers:

Quote/6.55
'Some students fail to comprehend the importance of this point and the significance of that point.' (L4)

Also, some listeners may fail to integrate different ideas while listening, as two lecturers observed:

Quote/6.56
'…probably because they understand point A and point B, but they don't understand why A and B go together.' (L3)

Indeed, the students also reported that they may fail to make links between ideas:

Quote/6.57
I usually link important points [made in a lecture] together myself at home … While listening, there is no time to do that, should I write? Should I look for links? This is often problematic for me. (S2)

According to two lecturers, listeners may also struggle with processing details, instead paying more attention to constructing a general picture (the gist) of what is being said:

Quote/6.58
'But somehow I encountered the opposite in some of the literature courses. I found that the students would usually understand the general picture but fail to understand specific details or concepts.' (L4)

Although the students did not report it as a difficulty, one lecturer claimed that some listeners may struggle to understand examples and differentiate new points from old ones (redundancy):

Quote/6.59
'But then if I give them the same example, but in a different form, they don't recognise that it's the same.' (L3)

3. Creating a text-level representation

Target needs

Regarding this process, Table 6-13 shows six sub-skills needed by listeners, of which students mentioned four.

Table 6-13: Creating a text-level representation – target needs

Total	L1	L2	L3	L4	L5	Sub-skill	S1	S2	S3	Total
6	2		1	2	1	Following overall lecture structure	2	1		3
3				3		Discovering similarities and differences				
2	1	1				Using speech transitions	1			1
2				1	1	Recognising recapped information				
1	1					Identifying the lecture's topic	1			1
						Inferring the lecture's main idea			2	2

When discussing with the lecturers the idea of following a structure as a way of handling different ideas, one proposed that listeners need to absorb a lecture's sequence of ideas, in terms of its introduction, body and conclusion (this is a more traditional structuring method, as Young (1994) argues):

Quote/6.60
'They are expected to know that this is an introduction, this is a body and this is the conclusion of our lecture.' (L4)

Meanwhile, another lecturer stated that attempting to impose a hierarchical structure might not always be appropriate. Instead, she said, such an approach may be more suited to literature or theoretical linguistics lectures, while a class involving more hands-on exercises such as discussions of noun phrases, with exercises and examples, may not call for the listener to follow a sequence of ideas. Despite her comment,

however, a listener still needs to grasp the development of a structure in terms of recognising example phrases, discussion and making transitions between ideas:

> ***Quote/6.61***
> 'Sometimes you can't really apply that and if you do apply it just looks silly because it really has nothing to do with what you're discussing. Like if you're talking about a noun phrase, there's really not much structure you can give to a noun phrase. You just give them examples and discuss the examples. … I would say that when you're talking about linguistic theory and when you're talking in most literature courses, I do believe that it would be extremely helpful, yes. Yes, to understand lectures you do need to understand the structure.' (L3)

One lecturer also mentioned that listeners should discern similarities and differences between different concepts, and not mingle information:

> ***Quote/6.62***
> 'But when it comes to the more complex ideas like, let's say transcendentalism … I write on the board a poem we've studied, then say here we have an example of transcendentalism and they see it, for example, the line, and show how the line is an example of this specific abstract idea or concept. Then we go into something else that they confuse with transcendentalism and we compare and contrast what are the different features, what differentiates this from that.' (L4)

Additionally, two lecturers said that they incorporate speech transitions while lecturing. For instance, according to one lecturer, such transitions are used to announce a series of procedures (such as how to draw a syntactic tree) and to ensure that listeners comprehend the links between different points at a more micro-structural level. This lecturer uses both English and Arabic transitions to move from one point to another. For example, she uses cues, such as 'when we begin', to initiate the analysis of a phrase-structure tree; 'because' to highlight cause and effect; and 'but remember that it is' to capture listeners' attention:

Quote/6.63

	Now how much of that gets comprehended - I get asked sometimes to repeat what I'm talking about. I find that when I'm explaining a tree, a syntactic tree that, although I'm using English for the entire subject matter, I notice that I do transition, use Arabic transitions. So I will say [spoken in foreign language]. You start with the [CP] from the very top and then you go down. [Spoken in foreign language]. You have to check for the subject lowering. [Spoken in foreign language]. We need to...
Sahar:	Why do you use these specific...
Lecturer:	Yeah. So I've noticed that in myself pretty - like I noticed it about a semester into my teaching when I first got back. That was really interesting to me, because I had been abroad for a really long time. I had gone months without ever using an Arabic word. To find myself doing this and - I think it connected me to them. It made me one of them.
Sahar:	What about the listeners in your class? Do you think that these words are useful to them?
Lecturer:	I think it helps them stay with me as I'm moving from one point to another, because in the tree, we are going from the backbone to the phrases to the bigger part, back to the detail. So I need to tell them where I am in my procedure, in my thinking process. I use English transitions as well, but I notice this. The reason I noticed it was because I was reading about - I had come across a paper that talked about using the L1 to teach the L2. I thought, well, how much of it do I do? When I was conscious of what I'm doing during one day, I noticed that it was always those transitions, so never the subject matter but always the transitions. I think maybe I think it helps keep them with me as I'm moving from one point to the next. I'm not really as concerned with them understanding the subject matter as I am concerned with them moving along with me through the subject matter. I want them to note that I'm moving forward, I'm done with this point.

(L1)

Target sub-skills also include identifying a lecture's title and knowing when the speaker is recapping on previous information:

Quote/6.64
'I think what helps a lot is PowerPoint. PowerPoint shows the major title… .' (L1)

Quote/6.65
'I try to focus on the main points. I try to summarise as much as possible, I try to repeat. So, repetition of main points.' (L5)

Expounding on the need to recognise a lecture structure, one student, when asked what aspects a listener needs to pay attention to, expressed:

Quote/6.66
The introduction, well the first thing the lecturer is saying when she says we will talk about this and that and so on, so I will know what she is going to discuss, so I jot down these headlines to use … of course the major title, the purpose of the lecture, to understand the rest. Also details, I feel everything is important, like when a point is explained, those details coming under a major point will help to understand it. I feel it is important to concentrate on that! (S1)

Present needs

Table 6-14 shows that lecturers reported two issues indicating ineffective creation of a text-level representation, while students reported two.

Table 6-14: Creating a text-level representation – present needs

Total	L1	L2	L3	L4	L5	Sub-skill	S1	S2	S3	Total
2				1	1	Following a lecture structure	1			1
1			1			Discerning similarities and differences				
						Constructing the main idea			1	1

Certain listeners may have difficulty discerning a lecture's structure:

> ***Quote/6.67***
> 'Then they will recognise it, but if the group is a poor one they will feel like they are not getting it, they do know that this is the introduction for example.' (L4)

> ***Quote/6.68***
> It depends! If a lecturer does not explicitly introduce [at the beginning of a lesson] what she will discuss, I may take time to figure the organisation out. (S1)

Further, one lecturer spoke about how some listeners cannot distinguish how ideas can be similar or different from each other in long arguments. For example, when comparing the findings of more than one study, some students cannot easily notice such differences or similarities:

> ***Quote/6.69***
> 'Where I find that students don't really listen well to a complicated topic, they don't understand it very well. … I'll give you an example. There was an issue in a study where we were studying if inhibition played a role in language learning success. We discussed a study where ... Later on this study was – it was heavily criticised by one of the original researchers. It was criticised, they said … So they did another study … This is an idea that was really difficult for the students to understand … because it kept going back and forth... .' (L3)

Finally, one student mentioned difficulty with constructing the gist of a lecture based on the many points it contained:

> ***Quote/6.70***
> Sometimes, the main gist is not clear … lots of talking but what is the gist? I must work on this when I read [notes/materials] after class … because I have no time, I try to concentrate on understanding those specific difficult points. (S3)

4. Creating an intertextual representation

Target needs

Table 6-15 shows 12 sub-skills concerning creating intertextual representations, which lecturers require listeners to use before, during or after a lecture. Of these, students reported nine sub-skills.

Table 6-15: Creating intertextual representations – target needs

Total	L1	L2	L3	L4	L5	Sub-skill	S1	S2	S3	Total
14	2	3	2	7		Connecting content from different speakers				
11		3	3	3	2	Linking related reading to current lecture	1		3	4
9	1	1		7		Linking previously heard subject-specific knowledge to current lecture	1		2	3
10	3	2	1	2	2	Connecting aural input to a textbook while listening		1		1
10	2	5		2	1	Completing assignments/exams after listening	1		3	4
8	1	4	1	2		Connecting aural input to clues given on a whiteboard while listening		2	1	3
5	1		1	2	1	Connecting information heard in a lecture to other materials after listening (e.g. references, textbooks)			1	1
6	4			2		Connecting aural input to clues given on slides while listening		1	1	2
6		3	2		1	Taking notes while listening	3	2		5
5	2			3		Connecting current lecture to next lecture(s) while listening				
5	2	1		2		Integrating information from multiple lectures after listening	1			1
2				2		Integrating information from different aural texts while listening (videos)				

Four lecturers mentioned situations in which listeners are expected to listen to other students, e.g. when students work together in groups or discussions:

> ***Quote/6.71***
> 'I think what our lectures do is to allow students ample opportunities for interaction, especially with a course like syntax where we're applying a lot. I don't do a lot of talking, so we do a lot of group work … it's not one on one interaction, but it's definitely a lot more interaction than I think goes on in other more theoretical classes. They get to hear a lot of English.' (L1)

As four lecturers and two students believed, it seems necessary to conduct relevant reading on the subject matter of a lecture before listening to it, in order to invoke the text read and make connections between it and the lecture while listening. Activating this sub-skill can facilitate comprehension and reinforce understanding of the content:

Quote/6.72
'It is definitely a need [preparatory reading] because they get an initial idea, then they come to class and they reinforce the idea… .' (L2)

Listeners are also expected to bear in mind related subject-specific knowledge (perhaps heard in previous lecture(s)/course(s)) and correlate it to new information to build an overall understanding, according to three lecturers and two students:

Quote/6.73
'Sometimes I start by asking questions about the previous lecture to remind them of what we said.' (L4)

Lecturers and students also reported situations in which listeners can potentially make connections between aural input and written material, such as short notes written on a whiteboard, on slides or in a textbook. This may not happen all the time, but occasionally, the lecturer will start reading the main point on a slide and then digress to explain it further. In this sub-process, listeners have to follow a sequence, as each connection linking the aural message to written content will lead to another, for example:

Quote/6.74
'If I have PowerPoint, that makes it really simple, because then I have my main points. Then we breeze through that and then those will be our focal points for discussion… .' (L1)

Four lecturers and two students thought that future assessment activities, such as assignments and exams, would usually be based on information heard in class. For instance, from their lectures, a student might predict how to answer a question in, say, an exam, or how to prepare an assignment, and they would be able to invoke additional knowledge while doing so. This might tell lecturers something about their comprehension of the content absorbed in class, for example:

Quote/6.75
'I like to see it [information in a lecture] in action. So if it's a research class, I would like to see what I talked about when it comes to synthesising information in the literature review that they're handing me later in the week. I'd like to see the methodology section, that they have seen several samples of, consolidated into their own. So what we talk about I look for in application. Usually that tells me how much of what we talked about that they have grasped.' (L1)

Similarly, four lecturers said that learned knowledge/meaning from lectures should help a listener to build their understanding and engage in other non-assessed activities, such as reading related texts (references/exercises) or other aural extracurricular activities.

Quote/6.76
'I don't like to limit what we do in classes to exam papers and grades. So I try to encourage them to do other things like online projects, like extracurricular activities, like – now we are developing a new idea of the human library … The lecture is the basis of what they are building.' (L4)

Further, three lecturers and two students stressed that note-taking is essential. According to the former, listeners must comprehend what is heard before noting information down, as well as discern the most important points, as not every single detail needs to be recorded. One student said that they used these notes at a later point to enhance their understanding of their textbook, for example:

Quote/6.77
'I believe that they should be able, first of all, to take notes efficiently. Take down notes. In lectures, the idea of being able to focus, as I said before, on the main issues of the lecture … the main points. This is usually my, let's say, principle aim.' (L5)

Two lecturers also said that some information heard needs to be carried forward and brought to mind when needed to better understand subsequent lectures:

Quote/6.78
'A new technical term and then a definition and just making that connection, studying it at home and then just being able to use it for the rest of the weeks. (L1)

As a final result, when one course comprises many lectures, three lecturers and one student said that the information each contains should be integrated together, as in this excerpt:

Quote/6.79
'…the students are expected to – by the end of the semester, not the lecture, the students are supposed to know what romantic poetry is, to know the major characteristics of romantic poetry; for example, to be able to analyse romantic poetry. So the students should know all of these things. So the objective is that the student is going to know by the end of the semester all of these things. (L4)

Present needs

Table 6-16 shows that lecturers reported nine sub-skills indicating ineffective creation of intertextual representation, while students reported seven.

Table 6-16: Creating intertextual representation – present needs

Total	L1	L2	L3	L4	L5	Sub-skill	S1	S2	S3	Total
12	2	5	2	1	2	Completing assignments/exams	2	2	2	6
8		2	2	2	2	Lack of understanding in the case of no prior reading being undertaken on the subject-matter of the current lecture			1	1
7	3	1	1		2	Integrating information from multiple lectures	1	3	2	6
4	1	1	2			Taking notes while listening		1		1
2				1	1	Linking previously heard subject-specific knowledge to the current lecture				
2	1			1		Connecting aural input to the textbook while listening	1	2		3
7	1	2	3		1	Connecting content from different speakers	1	1	1	3
3			1	1	1	Connecting information heard in lectures to other materials after listening			1	1
1	1					Understanding until applying theoretical knowledge				

According to all the lecturers, certain listeners may be unable to grasp how a lecture can help them study for exams or do assignments. Indeed, all interviewed students said that they sometimes lose grades because they cannot tell from a lecture what might be covered in an exam. The following excerpts illustrate these issues:

> ***Quote/6.80***
> 'I actually just gave the students the results for the first mid-term today and I had a couple of students who were like, well, what we talk about in class is not what you ask in the exam … because in our lectures, for the acquisition course I give them factual information and we discuss and give information, stories … Now in the exam I will ask them about those facts, but what they were listening to was all stories and everything like that. So they don't know how to relate that to the actual course material... .' (L3)

> ***Quote/6.81***
> 'I may expect some things in exams and study everything the lecturer explains in class. But later, I find that what I have studied is only useful for my knowledge, but unimportant for an exam.' (S3)

Four lecturers also stressed that when listeners do not do prior reading, they may encounter processing problems:

> ***Quote/6.82***
> 'Those students that don't read have absolutely no idea. They don't understand 70 per cent of what I'm saying.' (L2)

Four lecturers, based on what they had seen from completed exams and assignments, said that collating information from multiple lectures might be problematic for some listeners:

Quote/6.83
'That's why you'll find that they do really well on objective parts of the test. The true and false is not a challenge. The multiple choice is not a challenge. The fill in the blank to them is a piece of cake. When it comes to short questions, essays, any kind of synthesis exercise, that's where you lose them.. .' (L1)

The effective taking of notes might pose a challenge, according to three lecturers and one student:

Quote/6.84
'One issue we have a huge problem with – and probably one of the other instructors will tell you – is students not taking notes. … Yeah, they're not taking notes, which I find weird. So I wonder, if you don't have to take notes in class, are you really listening? If you don't have that pressure on you to grasp something while you're in there, do you really need to be there cognitively, mentally?' (L1)

Quote/6.85
I cannot write quickly, neither in Arabic nor in English. (S2)

Two lecturers also mentioned that certain listeners may fail to recall relevant subject-specific knowledge and sometimes need to have their memories jogged:

Quote/6.86
'Like yesterday I asked them do you know *The Man He Killed* and they paused. It's a very good group that I asked. So I asked them do you know *The Man He Killed* and they said no. Then I said it's a poem that is written by, and I mentioned the name of the poet, and I talked a little bit about the poem. Then they said: 'Yeah we remember, we studied it two semesters ago but we forgot the title.'' (L4)

Additionally, some listeners may struggle to relate coherently what is said in a class to the relevant text, unless the speaker overtly explains the connection:

Quote/6.87
'Unless I drew their attention to the fact that we are speaking about the first stanza, the first or second line; this way they are going to relate.. .' (L4)

Although one student reported no problems with relating input to textbooks, two students expressed that they did encounter such difficulties, for example:

Quote/6.88

I feel when the lecturer talks too quickly when talking about a certain point in the textbook, to move on to another one, and then a third and a fourth one which might be more important than the previous ones. Here, I may get lost because this was done too quickly and many points are discussed. (S1)

Another hurdle might occur during assimilating content delivered by other speakers:

Quote/6.89

'Back to my acquisition course … there is a lot of back and forth between the students and me. I do notice that I lose a good number of students when it comes to that kind of discussion, because they just can't follow the discussion. … They give good input and I do use some of their input in my lectures ... I even notice that they just – they kind of lean back in their chairs. They're not following the conversation. … I think they don't understand that whatever a classmate has to do as valid input... .' (L3)

One lecturer said that some listeners might fail to use the information garnered from a lecture to deepen their understanding of their textbook after listening. Indeed, one student reported that she does not always do so, instead relying on the notes and slides:

Quote/6.90

'Some of them are very honest and say we understand in class but when we go home we cannot relate what we understood to the book. So the book – you have what we can call very dry material. During classes and in the slides that I provide them with, we try to break parts into smaller parts, we connect things in a different way.' (L4)

Other listeners may not carry out additional reading in English in general, which may be required to understand the broad subject area of their lectures:

Quote/6.91

'I think this is mainly because most students do not read … Even though they are students of literature.' (L5)

One lecturer claimed that what is heard in class will be effectively understood only when students undertake a theoretical knowledge, such as in assignments:

Quote/6.92

'I'll tell you, in my composition class, I don't think it has come together as a big picture yet. I don't think it will come together as a big picture until they finally write their results section and see their paper come together.' (L1)

6.3.3 Cognitive and metacognitive strategies

Table 6-17 shows three metacognitive and five cognitive strategies that listeners are thought to use or need to engage in, as mentioned by lecturers and students.

Table 6-17: Metacognitive and cognitive strategies

Total	L1	L2	L3	L4	L5	Strategy	S1	S2	S3	Total
8	4		1	3		Pre-listening preparation	3		2	5
13	1	1	6	2	3	Directed attention	2		1	2
18	5	3	4	6		Comprehension monitoring			4	4
7	1	2	3	1		Fixation	2	1	1	4
4		1	2	1		Translation				
1	1					Inferencing			2	2
9	2	3	1	3		Prediction	1		1	2
5	2	2	1			Elaboration			1	1

Metacognitive strategies

1. Pre-listening preparation

Pre-listening preparation refers to listeners preparing themselves mentally and emotionally for a listening task (Goh, 2002). Based on what will be said during the lecture, listeners can establish the necessary conditions for successful listening by encouraging themselves internally and making a conscious decision to listen. They can motivate themselves by taking an interest in the subject matter before listening, clearing their minds of any distractions and readying themselves to focus completely on what is being said, for instance:

> ***Quote/6.93***
> 'Interest, motivation and I think - I've had students take a class with me and fail and then come back and do super well. I just think what happened was they made a decision to pay attention. They felt maybe the first time around that it was probably one of those courses I could pass without putting in as much effort. They were surprised with the F and then, the second time around, they're sitting in the front. They're front and centre. They're asking questions. They remember some of what they've done before, remember their problems during the final and are asking excellent questions. So it ended up not being a cognitive or a content challenge. It just had been a motivational one or just a decision.' (L1)

> ***Quote/6.94***
> 'It is important that a student is enjoying what is said. Actually, a student coming to a class needs to say [to herself] I want to listen and concentrate, prepare themselves.' (S1)

2. Directed attention

The analysis shows that the lecturers consider the directed attention strategy highly importan: that students can listen to a 50- or 100-minute lecture and give it their undivided attention without becoming fatigued. Listeners must learn to redirect their attention when it drifts for any reason. One student also said that when a listener takes the time to process a point and write it down at the same time, their attention can be sidetracked and should be redirected to the speaker:

> ***Quote/6.95***
> 'I think it has to do with attention span. She just can't listen for a long period of time. Sometimes in a lecture I need your attention for at least 50 minutes, like in one sitting . Then you can space out for like a couple of minutes, but I want you to come back to me for another 15 minutes and listen.' (L3)

> ***Quote/6.96***
> I feel I sometimes I focus on a certain part so I can jot it down after I have processed it, then [I find] the lecturer has already continued talking. Although I get confused, I try to [recover] quickly and as much as I can to listen to what is being said. (S1)

3. Comprehension monitoring

The analysis reveals that four lecturers spoke about situations in which listeners need to use such a strategy. Comprehension monitoring can be used to check new interpretations derived from listening against their prior understanding of the topic gained from conducting background reading for the lecture. Listeners can also use it to identify and clarify words/ideas they do not understand, so they may ask the lecturer to explain a certain point or quickly ask their classmate about a word's meaning. They can also invoke this strategy when another student asks a question and the lecturer answers. Thereby, the new information gained can enable listeners to address any discrepancy in their own understanding, for example:

> ***Quote/6.97***
> '…reading before coming to class is very useful and it paves the way for a better understanding. But the students who really read come to me and tell me that they notice the difference and some of them are students with a very low GPA level and they want to do whatever it takes to improve. So they come and tell me we notice the difference and I ask them to read again after

the lecture and see the difference. Did you understand it the same way as you understood it the first time? This is what I keep asking them.' (L4)

Quote/6.98
'…some students will just ask: Do we have transcendentalism here Miss, is it pantheism? So I answer them, yes or no, transcendentalism is this and that, and I give them an example from a poem that we studied to make it clear in their minds.' (L4)

Cognitive strategies

1. Fixation

Based on what three lecturers and three students reported, this may occur when certain listeners fixate on minor elements in a lecture, such as stopping to think about high-level words (their meanings or pronunciation) or stopping to think about words' (familiar or unfamiliar) pronunciation and spelling. Certain listeners may also stop to think about the meaning of specific parts of the input. Such fixation may cause later sections to go unnoticed and therefore be absent from the listener's understanding, as illustrated in these quotes:

Quote/6.99
'So when I use these [sophisticated] words I repeat the information and use other words but the students just stop at these words.' (L4)

Quote/6.100
'It affects their later understanding because she will understand part of it and then she will just put in the rest with whatever she understands from anything else. … I have like– the inhibition example I just gave you, we dealt with that like three weeks ago. That was something where the majority of the class just did not really follow. They didn't listen and they would understand from that, they would understand that alcohol and Valium will lower inhibition. That's what they would pick up from it. So there was just this misunderstanding because they didn't listen to the muscle relaxant part and stuff like that.' (L3)

Quote/6.101
Like the word corroborate, I know this word but the lecturer pronounced it in such a way that I thought it is a new word! I took some time to recognise this word and that I know it. (S1)

2. Translation

It has been stated by three lecturers that certain listeners fail to process speech immediately; instead, they mentally translate words into their L1 while they are being spoken. Alternatively, lecturers may themselves translate a certain keyword if they see that someone is struggling with it, for example:

> ***Quote/6.102***
> 'They need to think in English. They think in Arabic, so they do – our problem is that they listen to it but they don't – they end up translating it into Arabic and then they understand... .' (L2)

3. Inferencing

Inferencing refers to using related information within an aural text to guess unfamiliar words or to fill in missing information (types include linguistic, voice, paralinguistic and kinesic inferencing) (Goh, 2002). In this analysis, it has been said that listeners can use the speaker's body language to infer things they find problematic, or to guess words' meanings.

> ***Quote/6.103***
> 'Every time I feel there are probably a few more words that they're unfamiliar with but kind of grasp from the context.' (L1)

> ***Quote/6.104***
> When the lecturer explains the 19th-century novel we are studying, like funny or noble characters, she sometimes uses her body language so we can understand what the character has done. (S3)

4. Prediction

This strategy involves anticipating a lecture's contents (on a global level) or details (on a local level) while, or even before, listening (Goh, 2002). Four lecturers said that listeners may predict details, such as words in the message, before they are spoken. They may also preempt what they will hear based on: discussions with the professor at the outset of a lecture; by familiarising themselves with the linguistic content of the lecture before listening (through background reading); or by forecasting the general gist of the content (by, for example, using preview or brainstorming questions run by the lecturer prior to a class). Additionally, listeners are required to anticipate what

they will hear in a lecture based on (discipline-specific) information that is brought to their consciousness, often at the beginning of a class. The following quotes illustrate some of these issues:

Quote/6.105
'They follow closely and they know what is coming because they are really attentive and they finish the sentence before I even utter or say the last word.' (L4)

Quote/6.106
'…when students read beforehand they have an idea of what we're going to say. Therefore if there's a certain word that they notice has been repeated and they don't understand, they have time to open their dictionaries. So then when I come to class and speak, they understand what I'm talking about.' (L3)

Quote/6.107
'I also ask them or give them a question to think about … before the lecture. So I give them a question to think about. It relates to what we are going to deal with but it's like a hint. I do not give them the thing directly. So it triggers them to think about it … It's kind of interesting to ask them to prepare mentally... .' (L4)

Quote/6.108
Before attending a lecture, … I try to get a general idea of it by reading the headlines. (S1)

5. Elaboration

In this analysis, for example, one student said that she invoked her world knowledge gained from viewing the movie *Pride and Prejudice* to understand the novel discussed in class. Additionally, a speaker may explicitly refer to something from the listeners' prior experience/world knowledge that is not part of the content (e.g. a famous tweet), but is referred to in a lecture to facilitate the understanding of a certain point, as this quote shows:

Quote/6.109
'Other times, I feel like I have to fall back on a paraphrase or an example or something that happened in the department, that we all experienced together, so that I can draw them back to a reference that can be shared by everyone, so maybe like a really famous tweet or something interesting on TV that they could connect the idea to and so grasp it.' (L1)

6.3.4 Language-learning listening wants

This section presents the findings about the following four issues related to LCSA:

1. Students' awareness about their listening

When the lecturers were asked about how aware they thought learners, in the ELL programme, are of their academic listening ability and problems, they all said that only a few students seem to be aware of their own issues in this area. Rather than considering their ability, the learners tend to blame the speakers or the material for lack of understanding in lectures, or they do not realise that listening is a process that can be learnt:

> ***Quote/6.110***
> 'I would say 20 per cent of students are aware that they do have very big issues. They come to the department, ask us to give workshops on how to listen and how to take notes and stuff like that. … They don't understand the importance of listening. … Because I don't think that a lot of people realise that listening is a thing that you need to learn to do. I mean, with teachers, I myself was only very recently aware of this … I mean if the teachers, the educators, are not aware that this is a problem, how can we expect the students to be aware of it?' (L3)

While all the students said that they realise there are listening skills they need to apply and that they are sometimes aware that they have problems.

2. Students' willingness to improve their listening

The lecturers gave a variety of responses when asked whether they believed that their students would like to improve their listening ability for learning. For example, one lecturer believed that students seem to be more interested in speaking and writing than in listening, since they care about the image they present. Another lecturer, however, said that their learners might be willing to improve their listening if issues regarding their sub-skills were brought to their attention, as this quote shows:

> ***Quote/6.111***
> 'I think if attention were to be paid to their listening skills, I think they'd definitely want to improve. The numbers of students signing up for all these different skills workshops are astounding ... Students here really want to learn … They just need a little bit of guidance. So if somebody were to tell them, by the way, if you were to develop your listening skills, you'd probably do much better, they would do it … So if somebody were to put it up, an initiative, a listening-related initiative, I have no doubt that students

would be interested in doing it. It just hasn't been brought to their attention yet.' (L1)

All three students said they would be willing to work on their listening. As two of them put it, since lectures are delivered orally, processing material efficiently means immediate understanding and taking good notes instead of having to ask for help.

3. Most important need for academic listening

When lecturers were asked what their learners require most in a listening course, they identified needs such as: students needs to be well-read in general rather than only specialised books and learning how to connect ideas logically, to take efficient notes, to grasp the general idea and to identify what is important and what is not. For example:

Quote/6.112
'I think I would focus on note taking for a while, but I think I would graduate from that and maybe not emphasise that as much as I would emphasise skills on how to prioritise information. So from what you've heard, can you tell me the gist, the most important parts? Of everything we've just listened to, what's the main point? If they could somehow extricate that and the correct main point, I think that is something I would like for them to start noticing. Then maybe if I were to show them a list of details that had been presented, if they could connect the dots with which detail goes with which main point, then that'll tell me that they were actually listening and listening discernibly in a way where they're actually making connections with the points. So it's not just listening but it's logical clustering of ideas.' (L1)

The students reported their greatest needs as being to acquire general knowledge or the basics for their literature courses (particularly, earlier periods), as well as training in the pronunciation of letters, since some have different sounds that the listeners need to be familiar with.

4. The best way to teach listening

When asked about the best way to teach listening, the lecturers generally responded that they did not know. For example, one lecturer said, 'I don't know … I've never taught listening. I'm an applied linguist.' Other lecturers gave vague answers, suggesting applications such as using podcasts or having a specialist design the course. Nevertheless, one lecturer gave the following lengthy answer recommending a

course that does not focus on a specific type of listening but offers a variety of skills to prepare learners not only for their lectures but also for other areas of their lives:

Quote/6.113

Lecturer:	Yeah. But I mean, if I were just doing listening, I'd probably make it exercise based on situations where you would need to listen, the lecture being only one of them but not - I wouldn't make it the core of everything I do, because I feel that there's a really quick newsfeed that you need to pick up as you're walking along. There's an announcement that you need to be able to pick up, especially in an airport. There are other types of listening needs that you need to cultivate. So the lecture would probably be one unit, but I don't think it would be the only one. Yeah.
Sahar:	But this, I mean, might help them comprehend their lectures in this department...
Lecturer:	Yeah, absolutely.
Sahar:	...if we focus on just one type of listening and ignore the other types such as...
Lecturer:	Yeah. Well, it depends. I mean, in this department, you've got - because you've got your mix of literature and linguistics. What's happening on campus a lot is we're transitioning to the workshop set-up. So even when they sign up for training, it's workshop set-up where you have not a very long time of presentation but they really have to be listening, and a lot of discussion and a lot of work, group work. I find that we are slowly moving away from the purely lecture mode, although you can never be without it. It is so essential for that - especially for the introductions, for highlighting the main points, for setting the scene for whatever learning you want to take place. So I think with an attention span of 10 to 15 minutes if we're being really hopeful, you can emphasise skills that would allow students to take out as much as possible, as much benefit as possible from those 10 to 15 minutes. Even though they would need them and they would require them, I would still diversify their listening experience, only because I don't feel that my job is to prepare them for this program only. I don't know how many of them are going to stay in this field. I think my job is to prepare them for their time outside these walls honestly and so cultivation of other skills - I teach linguistics and I want them to know their linguistics well. I would love for some of them to stay in linguistics, but they're not all going to stay in linguistics. So I would rather they leave me with a diversified skill set than they would in a specialty knowledge and a specialty skill, but that's my philosophy in teaching. Another person's philosophy in teaching might be, no, I would want to focus on this one point and make sure they know it very well. So I mean, that's just a philosophical difference.

(L1)

The students gave general responses about teaching listening, from talking to native speakers and watching videos to simply answering that they did not know.

6.4 Summary

Phase 3 analyses showed that five lecturers identified 41 sub-skills that were linked to the seven cognitive processes that listeners need to engage in to comprehend lectures efficiently. The three students identified 29 such sub-skills. The lecturers further identified 30 difficult sub-skills, while the students identified 19 (all those mentioned by the students were also mentioned by the lecturers). Both lecturers and students focused on higher-level more than lower-level processes as target and present needed sub-skills (based on frequency of mentions) to process lectures in this TLU.

As the essential lower-level sub-skills needed to process lectures, the lecturers emphasised the importance of perceiving prosody, understanding technical words and proper nouns, and linking content to syntactic knowledge, while downplaying understanding English accents. While the students believed that it was important to notice keywords, discern prosody and notice how words were pronounced in connected speech, they felt it less important to decode fast speech or to notice proper nouns while listening. Regarding necessary higher-level sub-skills, the lecturers required listeners to recall information already given and processed to understand another point in the lecture, to make judgements about ideas, to follow a lecture's structure, to link prior reading to the lecture, and to complete assessment activities based on what was understood in the lecture. The students, however, emphasised following the lecture structure and recognising paraphrasing but did not mention essential sub-skills, such as identifying peripheral information and recognising similarities and differences as emphasised by the lecturers.

Concerning the difficult lower-level sub-skills that listeners in this TLU are struggling with, the lecturers noticed that certain listeners had decoding problems, such as processing input in real time and difficulty accessing vocabulary, and mostly listeners had weak language proficiency, which affected their understanding. The students did not mention these problems and instead emphasised difficulty with understanding technical words (but not general vocabulary) and decoding other students' speech. They did not express any difficulty with fast speech or accents. As for higher-level difficult sub-skills, the lecturers stressed that certain listeners struggle to process complex concepts literally and link what is heard to their world knowledge. The students did not mention having difficulties with these matters. Both students and lecturers expressed that certain listeners had difficulty making judgements about ideas in the text, discerning the relationships between them and following the lecture's structure. Furthermore, the lecturers indicated the need to use metacognitive strategies (pre-listening preparation, comprehension monitoring, directed attention) and cognitive strategies (elaboration, prediction), whereas only two students emphasised metacognitive strategies, namely pre-listening preparation and comprehension monitoring.

Finally, the learning needs identified differed between students and lecturers and amongst the participants in each group. For example, the lecturers generally thought that their listeners needed help with higher-level processes, especially with creating a textual-level representation, e.g. clustering numerous ideas in a logical way. However, the students generally thought that they needed more instruction on lower-level processes, especially how to recognise sounds (in words/letters). Overall, it can be concluded that the students here have limited knowledge about how they should listen to lectures and what strategies to use to solve comprehension problems. Whilst, lecturers were able to identify several sub-skills and strategies that they expect their listeners to employ during lecture-listening.

Chapter 7 Evaluating data sequenced in the first strand of the study against expert panel feedback (Phase 4)

7.1 Introduction

This chapter describes the methodological step (phase four) of the study. It covers an expert panel review session with four expert judges. The goal of this phase was to conduct a reliability and validity check on the analyses of the previous three qualitative phases. It aims to establish whether these analyses were meaningful and justified, thus confirming the academic listening target and the present needs required to move on to the final phase of the study. The process helped to evaluate the validity and reliability of the findings from the first strand of the study's sequencing approach, based on views from expert judges external to the TLU, to the justification for proceeding to the second strand of the sequencing approach.

Section 7.3 below describes the methodology used in Phase 4 while Section 7.3 summarises the findings. Finally, Section 7.4 summarises the chapter.

7.2 Data collection and analysis

7.2.1 Conducting an expert panel review session

An expert panel, defined as 'a group of people specifically convened by the researcher to elicit expert knowledge and opinion about a certain issue' (Sekaran & Bougie, 2016, p.122), was assembled to assess some of the findings (in terms of codes for the sub-processes) generated by means of sequencing from Phases 1–3 so as to inform this research's next phase. The following subsections explain the materials used for this expert panel, the analysis, its participants and the procedure.

Materials

The materials included:

- PowerPoint slides (37) used to familiarise all experts with the research project aims, context and the overall design, as well as to provide a detailed theoretical

explanation of the model used in the study. Of note, however, at the time when this panel was assembled, was that the study's model (as presented in Fig 2-4) was still being developed. It generally only included the study's main model, from Field (2013), and models such as those from Young (1994), Flowerdew and Miller (2005) and Aryadoust et al. (2013), which worked as preliminary models. In order to propose a model for this study which fits the data, after I collected the data from all four phases of the study, I reviewed the data analysed in the previous phases, particularly in terms of describing the codes or sub-skills representing processes and associating sub-skills to more overall general processes. As mentioned earlier, the process of developing a model was not linear. For example, I ended up with a great number of listening sub-processes which are required from listeners while listening; without making any distinction between a sub-skill and a strategy, I considered everything as a sub-process. However, I later decided to focus on three elements, sub-skill, strategy and process, as I felt it necessary to differentiate among them. Thus, I have developed the model in Fig 2-3. To give another example of the non-linear model development, when trying to align models in the literature with my integrated findings, at the beginning of the study, I used the six main components of Aryadoust, Goh and Lee's (2012) model as an overarching model and for the purpose of categorising the sub-processes found in the data. However, this did not work, because there were several sub-processes that could belong to two components, particularly the Cognitive Processing Skills and Linguistic Components Prosody. Thus, I tried to align the findings (i.e. the sub-skills and strategies) which emerged from my data to models in the literature, in particular the overall processes in Filed (2013) and Khalifa and Weir (2009). This helped me identify five models, as described in Chapter 2, in order to develop a specific holistic model that integrates these five models, as illustrated in Fig 2-4. The PowerPoint slides also included a description of the activities they were going to do and three judgement tasks accompanied by audio-recordings.

- A task booklet (Part 1) which contained three judgement tasks based on excerpts that were randomly selected from the previous phases. The booklet can be found in Appendix L.

1. *Judgement Task 1* booklet, which related to Phase 1, included an excerpt transcript of the *Sociolinguistics* lecture (5:19 min. long) the participants were expected to read while listening to an audio recording. This was followed by 73 quotes with their codes.
2. *Judgement Task 2* booklet, which related to Phase 2, included an excerpt from the *Poetry* lecture (3:47 min. long) and an excerpt from a stimulated recall with a first-year student based on the lecture section she listened to and reflecting any listening problems. It was followed by a list of ten quotes and codes.
3. *Judgement Task 3* booklet, which related to Phase 3, consisted of four parts from the interviews with two lecturers who were discussing their academic experiences in the study's TLU. Parts A and B contained two excerpts from an interview with a linguistics lecturer, followed by four codes and quotes (A) and two codes and quotes (B). Parts C and D contained two excerpts from an interview with a literature lecturer, followed by five codes and quotes (C) and eight codes and quotes (D).

- An answer booklet – Table of Specifications (Part 2) (Appendix M). Each table, for each judgement task in Part 1, was introduced by a question and had four columns; namely, a quote number, a code label/title, a yes-no option and room for qualitative feedback. Each table was followed by a question that asked participants to rate the coding presented for the task as a whole based on a 5-point Likert scale (5=agree; 1=disagree) and write down anything that they wanted to add to the interpretation. Of note is that the code labels were not a major concern while conducting the panel, as the study model was not complete, and these labels were refined during the entire study. For example, 'dealing with speed' as a code label was later refined to become 'understanding fast speech'.

The approach taken for constructing the Table of Specifications used in this phase was adapted from Newman, Lim and Pineda (2013), who recommend estimating the content validity (of an instrument) using Table of Specifications (ToS) methodology. According to Newman et al. (2013), a ToS is 'a set of procedures that attempts to align a set of items, tasks, or evidence with a set of concepts that are to be assessed' (p.246).

Thus, expert raters estimate the alignment between evidence and concepts by providing both quantitative (percentage or a yes-no format) and qualitative (feedback) data. Here, a ToS was used to verify the target and present needs using the question:

> 'In your view, does the transcript quote represent the following target/present cognitive listening sub-process (e.g. lexical search – an entry in the table)?'

Each judge was asked to answer this question in a yes-no format as well as provide any qualitative feedback.

Analysis

Newman et al. (2013) suggest different ways to analyse ToS data. One way, used here, is a simple percentage agreement calculation for judgements in order to obtain an estimate of how adequate an item is for evaluating a concept. As the authors argue, this approach is simple and can be used even with a small number of participants. For example, if there are five judges and four agree, that indicates 80 percent agreement; thus a researcher should aim for at least 80 percent agreement to have confidence in each item. Because the current study had four participants, each participant represented 25 percent, so 75 percent agreement could be considered appropriate. The judges' comments are included in the findings tables, and some are used in the results.

Participants and procedure

The expert judges were external to the study's actual context. Four volunteer members of the Language Testing Research Group at Lancaster University (one visiting researcher and three PhD students) were chosen because they possess general background knowledge in applied linguistics. More specifically, they have considerable experience with qualitative data. Two volunteers were working on cognitive language processing. All have taught in a university context — two internationally and two in the UK. These judges were non-native English speakers, i.e. Sri Lankan, Thai, Chinese and Polish. The session with these four judges lasted for about half a day (3hrs and 30 min.). No discussions were conducted, they silently completed the judgement tasks.

7.3 Expert panel findings

Overall, the expert judges gave positive responses, in that each code label represented a particular sub-process for a quote. They also offered a few negative responses regarding some sub-processes, such as a quote might not clearly show a target or a present sub-process as it is reflected in the code label, or the quote might need a larger amount of text (perhaps the whole lecture) for a judge to decide whether the code label accurately captures a sub-process or not. The judges also identified a few additional sub-processes that they considered necessary for the listeners in this TLU, e.g. using cultural knowledge, listening to explicit information and mentally linking all points being said while listening to them. Finally, the judges generally believed the descriptions of code labels were not adequate at times, which helped refine the code (sub-process) titles for the present study.

Below, each judgement task's findings are presented individually, along with the tables showing the raw responses, agreement percentages and some quotes.

7.3.1 Judgement task 1

As Table 7-1 shows, three to four judges agreed on 63 of the interpretations of sub-processes that were rated highly; only 10 sub-processes were potentially rated low (i.e. the judges did not agree with the interpretation of the sub-processes demonstrated in those quotes) as can be found in Appendix L.

Specifically, all judges were in full agreement (100%) on 35 codes, i.e. they all agreed that these 35 codes did indeed represent the sub-processes demonstrated in the relevant quotes vis-à-vis this judgement task. Three judges (75%) agreed on 28 codes – a result that also indicates good agreement. Furthermore, eight other codes received 50 percent agreement (i.e. only two judges agreed on them), which indicates unacceptable agreement according to Newman et al. (2013). For example, judges were asked if the code/sub-process 'anticipate in real time the content of a lecture' reflects what a listener must do based on some relevant quotes (the code is intended to predict content and answers to questions the speaker raises) (quotes can be found in Appendix L); however, the judges, as can be seen in Table 7-1, gave Q1/14, Q1/15 and Q1/16 a low rating of 50%, i.e. only two judges found the code suitable for the quote. Perhaps the code label 'anticipate in real time the content of a lecture' did not capture the intended meaning

here, which then confused the judges and resulted in low agreement. As another example, three judges did not provide an answer for the code 'identifying supporting details' in relation to Q1/29, rated at 25%, and Q1/30, rated at 50%. This result was possibly because, as J4 wrote, it was a 'very short excerpt, difficult to analyse'. In addition, two codes received a notably low rating of 25% (i.e. three out of four participants did not agree that the codes represented the sub-processes). For instance, when participants were asked to judge the sub-process (Q1/21) 'comprehend that a student's answer is wrong', J1 wrote, 'I'm not sure about this one. This extract only doesn't do it, but maybe [it's ok] in the context'.

Table 7-1: Judgement task 1 rating

Q = Quote	Target sub-processes	J*1	J2	J3	J4	Agreement percentage	Comments
Q1/1	Add information from the real world	*Yes*	*Yes*	*Yes*	*Yes*	**100%**	'Especially the information after so…' (J2) 'What does it mean 'add information from the real world', that is, the listener has to activate his real world knowledge to understand it.' (J3)
Q1/2	Add information from the real world	*No*	*Yes*	*No*	*Yes*	**50%**	'Paraphrasing/Explanation' (J1)
Q1/3	Add information from the real world	/	*Yes*	*Yes*	*Yes*	**75%**	'I'm not sure whether this 'adds' info from the real world.' (J1)
Q1/4	Add information from the real world	*Yes*	*Yes*	*Yes*	*Yes*	**100%**	
Q1/5	Add information from the real world	*Yes*	*Yes*	*Yes*	*Yes*	**100%**	
Q1/6	Add information from the real world	*Yes*	*Yes*	*Yes*	*Yes*	**100%**	
Q1/7	Add information from the real world	*Yes*	*Yes*	*Yes*	*Yes*	**100%**	
Q1/8	Add information from the real world	*Yes*	*Yes*	*Yes*	*Yes*	**100%**	
Q1/9	Add information from the real world	*Yes*	*Yes*	*Yes*	*Yes*	**100%**	
Q1/10	Add information recalled from the same lecture to comprehend a point	*Yes*	/	*Yes*	*Yes*	**75%**	'Not sure. It can be cultural/background knowledge.' (J2)
Q1/11	Anticipate in real-time the content of a lecture	*Yes*	*Yes*	*Yes*	*Yes*	**100%**	
Q1/12	Anticipate in real-time the content of a lecture	*Yes*	*Yes*	*Yes*	*Yes*	**100%**	
Q1/13	Anticipate in real-time the content of a lecture	*Yes*	/	*Yes*	*Yes*	**75%**	Q13-Q16 'Not sure! It can be adding from background knowledge.' (J2)
Q1/14	Anticipate in real-time the content of a lecture	*No*	/	*Yes*	*Yes*	**50%**	'Q14/Q15/Q16 This is more like [unclear] I don't think listeners can anticipate the content from this. It is difficult to judge from this without knowing the content of the lecture.' (J1)
Q1/15	Anticipate in real-time the content of a lecture	/	/	*Yes*	*Yes*	**50%**	
Q1/16	Anticipate in real-time the content of a lecture	/	/	*Yes*	*Yes*	**50%**	
Q1/17	Benefit from paraphrase	*Yes*	*Yes*	*Yes*	*Yes*	**100%**	
Q1/18	Benefit from paraphrase	*Yes*	*Yes*	*Yes*	*Yes*	**100%**	
Q1/19	Benefit from paraphrase	*Yes*	*Yes*	*Yes*	*No*	**75%**	'I'm not sure there is a paraphrase here, more repetition? (J4)

Q1/20	Comprehend that a student's answer is wrong	*Yes*	*Yes*	*Yes*	*Yes*	**100%**	
Q1/21	Comprehend that a student's answer is wrong	*/*	*/*	*No*	*Yes*	**25%**	'I'm not sure about this one. This extract only doesn't do it, but may be in the context.' (J1) '? Not sure.' (J2)
Q1/22	Connect to information given in PowerPoint slides	*Yes*	*Yes*	*Yes*	*Yes*	**100%**	**'**I'm assuming that 'this is' mean speaker is point at PPT.' (J1) 'If 'minimal responses' was mentioned before.' (J2)
Q1/23	Connect to information given in PowerPoint slides	*Yes*	*Yes*	*Yes*	*Yes*	**100%**	'here = PPT' (J1)
Q1/24	Connect to information given in PowerPoint slides	*Yes*	*Yes*	*No*	*Yes*	**75%**	'Anticipate in real time the content – this is also here' (J1) 'Understand the lecturer's explanation' (J3)
Q1/25	Connect to information given in PowerPoint slides	*Yes*	*No*	*No*	*Yes*	**50%**	'did not have enough detail to say.' (J2) 'Understand the lecturer's explanation' (J3)
Q1/26	Connect to information given in PowerPoint slides	*Yes*	*Yes*	*Yes*	*Yes*	**100%**	
Q1/27	Identify a central idea	*Yes*	*Yes*	*Yes*	*Yes*	**100%**	
Q1/28	Identify peripheral information unrelated to the topic	*Yes*	*Yes*	*No*	*Yes*	**75%**	'Yes, to the first chunk of information' (J2) 'Identify it as a 'lead-in' (J3)
Q1/29	Identify supporting details	*Yes*	*/*	*/*	*/*	**25%**	'Not have enough inf. to say.' (J2) 'I don't think these excerpts are supporting detail.' (J3) 'Very short excerpt, difficult to analyse' (J4)
Q1/30	Identify supporting details	*Yes*	*/*	*/*	*Yes*	**50%**	'Not have enough inf. to say.' (J2)
Q1/31	Identify supporting details	*Yes*	*Yes*	*/*	*Yes*	**75%**	
Q1/32	Identify supporting details	*Yes*	*Yes*	*/*	*Yes*	**75%**	
Q1/33	Identify supporting details	*Yes*	*Yes*	*/*	*Yes*	**75%**	
Q1/34	Lexical search	*Yes*	*Yes*	*Yes*	*Yes*	**100%**	
Q1/35	Lexical search	*Yes*	*Yes*	*Yes*	*Yes*	**100%**	
Q1/36	Lexical search	*Yes*	*Yes*	*Yes*	*Yes*	**100%**	
Q1/37	Look out for technical terminology	*Yes*	*Yes*	*/*	*Yes*	**75%**	'What is the difference between these two codes? Why not use 'understand technical terminology'?' (J3)
Q1/38	Look out for technical terminology	*Yes*	*Yes*	*/*	*Yes*	**75%**	
Q1/39	Look out for technical terminology	*Yes*	*Yes*	*/*	*Yes*	**75%**	
Q1/40	Look out for technical terminology	*Yes*	*Yes*	*/*	*Yes*	**75%**	
Q1/41	Look out for technical terminology definitions/glosses	*Yes*	*Yes*	*/*	*Yes*	**75%**	
Q1/42	Look out for technical terminology definitions/glosses	*Yes*	*Yes*	*/*	*Yes*	**75%**	
Q1/43	Look out for technical terminology definitions/glosses	*Yes*	*Yes*	*/*	*Yes*	**75%**	
Q1/44	Pay attention to specific articulated phonemes	*Yes*	*Yes*	*No*	*Yes*	**75%**	'I prefer to code this as 'understand the lecturer's examples to get an idea.' (J3)
Q1/45	Recognise that a speaker is using a synonym of a word	*Yes*	*Yes*	*Yes*	*Yes*	**100%**	
Q1/46	Recognise that a speaker is using a synonym of a word	*Yes*	*Yes*	*Yes*	*Yes*	**100%**	
Q1/47	Recognise that a speaker is using a synonym of a	*Yes*	*Yes*	*Yes*	*Yes*	**100%**	

	word						
Q1/48	Recognise when a speaker indicates new points	*Yes*	*Yes*	*Yes*	*Yes*	**100%**	
Q1/49	Recognise when a speaker indicates new points	*Yes*	*Yes*	*Yes*	*Yes*	**100%**	
Q1/50	Recognise when a speaker indicates new points	*Yes*	*Yes*	*Yes*	*Yes*	**100%**	
Q1/51	Recognise when a speaker is making a summary	*Yes*	*Yes*	*Yes*	*Yes*	**100%**	
Q1/52	Understand classmates when they talk in English despite their mistakes	*Yes*	*Yes*	/	*Yes*	**75%**	'What does this code refer to? The lecturer understands what the students say. It is not a cognitive process for the students.' (J3)
Q1/53	Understand classmates when they talk in English despite their mistakes	*Yes*	*Yes*	/	*Yes*	**75%**	
Q1/54	Understand the lecturer's examples to get a general idea of something	*Yes*	*Yes*	*Yes*	*Yes*	**100%**	Q54-Q58 'They are clear!'. (J2)
Q1/55	Understand the lecturer's examples to get a general idea of something	*Yes*	*Yes*	*Yes*	*Yes*	**100%**	
Q1/56	Understand the lecturer's examples to get a general idea of something	*Yes*	*Yes*	*Yes*	*Yes*	**100%**	
Q1/57	Understand the lecturer's examples to get a general idea of something	*Yes*	*Yes*	*Yes*	*Yes*	**100%**	
Q1/58	Understand the lecturer's examples to get a general idea of something	*Yes*	*Yes*	*Yes*	*Yes*	**100%**	
Q1/59	Use general pitch movements to recognize Qs need responses	*No*	*Yes*	*Yes*	*Yes*	**75%**	'This depends on the recording, after listening again, yes, they are.' (J2)
Q1/60	Use general pitch movements to recognize Qs need responses	*Yes*	*Yes*	*Yes*	*Yes*	**100%**	
Q1/61	Use general pitch movements to recognize Qs need responses	*No*	*Yes*	*Yes*	*Yes*	**75%**	'I think the pitch movements matter in 69, 65, and 66.' (J1)
Q1/62	Use general pitch movements to recognize Qs need responses	*No*	*Yes*	*Yes*	*Yes*	**75%**	
Q1/63	Use general pitch movements to recognize Qs need responses	*No*	*Yes*	*Yes*	*Yes*	**75%**	
Q1/64	Use general pitch movements to recognize Qs need responses	*No*	*Yes*	*Yes*	*Yes*	**75%**	
Q1/65	Use general pitch movements to recognize Qs need responses	*Yes*	*Yes*	/	*Yes*	**75%**	Q65-67 'Why not code as 'use general pitch movements to recognize rhetorical questions.' (J3)
Q1/66	Use general pitch movements to recognize Qs need responses	*No*	*Yes*	/	*Yes*	**50%**	
Q1/67	Use general pitch movements to recognize Qs need responses	*Yes*	*Yes*	/	*Yes*	**75%**	
Q1/68	Use general pitch movements to recognize rhetorical Qs	*No*	*Yes*	*Yes*	*Yes*	**75%**	Q68, Q69, Q70.'They are likely to be, need to check with the voice recording.' (J2)
Q1/69	Use general pitch movements to recognize rhetorical Qs	*Yes*	*Yes*	*Yes*	*Yes*	**100%**	
Q1/70	Use general pitch movements to recognize rhetorical Qs	*Yes*	*Yes*	*Yes*	*Yes*	**100%**	
Q1/71	Use information from previous lessons	/	*Yes*	*Yes*	*Yes*	**75%**	'Not sure. May be without knowing the content of the previous lecture. It is difficult to decide.' (J1) 'If there were mentioned before.' (J2)
Q1/72	Use information from previous lessons	/	*Yes*	/	*Yes*	**50%**	'I prefer to code this as 'use the morphological characteristics of words.' (J3) 'Assuming this has been covered' (J4)
Q1/73	Use the morphological characteristics of words	*Yes*	*Yes*	*Yes*	*Yes*	**100%**	

*Judge

When the judges were asked if the codes in Table 7-1 covered all the sub-processes a listener needs to employ when listening to an excerpt from the *Sociolinguistics* lecture, three judges circled '4' and one circled '5' on the scale from '1=disagree' to '5=agree'. In terms of qualitative feedback, J1 (see *Quote/7.1*) thought that the sub-processes included in the table did not reflect *all* the abilities that a listener needs to engage in in order to successfully process the excerpt taken from the *Sociolinguistics* lecture related to Task 1. J1 noted that more higher-level sub-processes might be needed here, namely, drawing on cultural and subject matter knowledge to process examples and paraphrases the speaker delivered to listeners. J1 also believed that understanding speakers with different accents, as a lower-level sub-process, is required as well when listening to the excerpt from the lecture related to this task. Two other judges (J2 and J3) thought that the wording or descriptions of the sub-processes sometimes confused them (*Quote/7.2*); however, as previously indicated, the wording in these codes was revised over time to capture the specific sub-process needed to be employed by listeners.

> ***Quote/7.1***
> 'I am not sure if it reflects "all" skills that listeners in this context need to have. They (students) need knowledge on culture, subject area etc. in order to understand some examples/paraphrases provided by the lecturer. They may also need the ability to understand speakers with different accents, link information to the overall subject/topic of the lecture etc.' (J1)

> ***Quote/7.2***
> 'Some categories of the code do not seem to represent the cognitive processing/ e.g. " add information from the real world" I am not sure how this would be related to cognitive processing [unclear] contextualizing what to listening. It is hard to say what type of knowledge students rely on to understand the listening passage e.g. knowledge from previous lecture, background knowledge, and cultural knowledge. My concern is not about what the coded data reflect the code categories, but more about the coding scheme and the description of each category (whether they explain cognitive processing needs).' (J2)

7.3.2 Judgement task 2

As can be seen in Table 7-2, six out of the ten interpretations of codes/sub-processes were given full agreement (100%, four agreed), two codes were given good agreement (75%, three agreed), and the remaining two codes received low agreement (50%, only two agreed). The sub-processes that did not receive complete agreement (only 50%)

included Q2/2 'decode known words in rapid speech'; J1 wrote that this sub-process seems not be related to this particular listener's ability as the quote related to the code does not demonstrate unsuccessful decoding. As another example, two judges did not agree that Q2/10 'understand complex grammatical structures' caused the listener a cognitive processing problem here (see Appendix L for quotes).

Table 7-2: Judgement task 2 rating

Q = Quote	Present sub-process	J1	J2	J3	J4	Agreement percentage	Comments
Q2/1	Decode known words in rapid speech	*Yes*	*Yes*	*Yes*	*Yes*	**100%**	'Clear' (J2)
Q2/2	Decode known words in rapid speech	*Yes*	/	*No*	*Yes*	**50%**	'May be. But this might not be directly related to this student's listening ability.' (J1)
Q2/3	Generate a bridging inference	*Yes*	*Yes*	*Yes*	*Yes*	**100%**	'Clear' (J2)
Q2/4	Lack of world (prior) knowledge	*Yes*	*Yes*	*Yes*	*Yes*	**100%**	'Cognitive?' (J1) ' + and also the problem of linguistic decoding. Despite no background knowledge student can understand it if he/she understand linguistic information in the listening.' (J2)
Q2/5	Low level in using cognitive compensation strategies	*Yes*	*Yes*	*No*	*Yes*	**75%**	'Cognitive?' (J1) 'Confidence is not a cognitive process.' (J3)
Q2/6	Process the text quickly enough to understand immediately (slow listening)	*Yes*	/	*Yes*	*Yes*	**75%**	'Not sure' (J2)
Q2/7	Process the text quickly enough to understand immediately (slow listening)	*Yes*	*Yes*	*Yes*	*Yes*	**100%**	' + also semantic processing' (J2)
Q2/8	Ripple effect of misunderstanding	*Yes*	*Yes*	*Yes*	*Yes*	**100%**	
Q2/9	Semantically process a group of words (partial meaning)	*Yes*	*Yes*	*Yes*	*Yes*	**100%**	'Very clear' (J2)
Q2/10	Understand complex grammatical structures	*No*	/	*Yes*	*Yes*	**50%**	'If this is judged based on what she said (e.g. that she didn't use words such as …, if it is not related to listening, but to her speaking ability.' (J1) 'Not sure' (J2)

In addition, when judges were asked if the codes in Table 7-2 reflected all the processing problems that might have hindered this particular listener, all four judges chose '4' out of '5', suggesting agreement. However, the judges did express that this particular listener might have had other processing problems, such as those mentioned in the following quotes:

Quote/7.3
'Perhaps the student needed the ability to decode pronunciation of unfamiliar term may be she needs the ability to make the knowledge of genre-related terms into what comes in the lecture.' (J1)

Quote/7.4

'I am not sure of each of the coded information is cognitive processing or a problem of each stage level of cognitive processing. For example, the last code (Qa:10) is not only about understanding complex grammatical structure but also a problem of semantic processing.' (J2)

Quote/7.5
'I really can't understand why the student kept on mentioning that she didn't know that "Harlem" refers to a city in New York or she seems to me that she connects the lecturer's former sentence with the later one wrongly. So we can add one more code, she has a problem with understanding reference.' (J3)

Quote/7.6
'Understanding how the text is linked together perhaps so linking words most of which were rather explicit.' (J4)

7.3.3 Judgement task 3

Table 7-3 shows that the judges agreed on five codes (100%), and only one code received low agreement (50%) vis-à-vis two excerpts (3A and 3B) from the interview with the linguistics lecturer. Based on the code that was rated potentially low (Q3a/3), J4 did not agree that the sub-process 'make quick connections between ideas at a local-level' measures what the lecturer said, whereas another judge did not respond at all.

Table 7-3: Judgement task 3 (A and B) rating

Q = Quote	Target sub-processes	J1	J2	J3	J4	Agreement percentage	Comments
Q3a/1	Listen and retain (remember) what you are listening for/have just listened to.	*Yes*	*Yes*	*No*	*Yes*	**75%**	
Q3a/2	Look out for speech transitions (Uttered in Arabic or English)	*Yes*	*Yes*	*Yes*	*Yes*	**100%**	
Q3a/3	Make quick connections between ideas (at a local-level)	*Yes*	*Yes*	*No*	*/*	**50%**	'Not sure, not sure what subject lowering is'. (J4)
Q3a/4	Organise speech in mind	*Yes*	*Yes*	*Yes*	*Yes*	**100%**	'Or visualization of the lecture.' (J2)
Q3b/1	Look out for technical terminology and extract definitions.	*Yes*	*Yes*	*Yes*	*Yes*	**100%**	
Q3b/2	Remember the technical term and make associations with the term and how they can apply it.	*Yes*	*Yes*	*Yes*	*Yes*	**100%**	

In terms of rating the two excerpts as a whole (Q3a and Q3b), first, regarding the Q3a excerpt, J3 rated it '3' (neither agree nor disagree), J1 rated it '4' and the other two judges rated it '5'. The judges believed that the listener, based on the excerpt, needs to engage in other sub-processes, mainly, linking different spoken pieces of information at a more global level and visualising the lecture's structure in the mind even when there

are problematic words and points for the listener. Examples of two comments made by the judges:

Quote/7.7
'Making links mentally of the points made (moving along with me through this subject matter).' (J1)

Quote/7.8
'It seems to me that the lecturer emphasizes that it is important for students to follow her in explanation even if they don't catch some of the contents.' (J3)

Regarding rating the Q3b excerpt as a whole, all judges rated it '5', except J3 who gave it '4' and indicated that remembering a technical term and using it later may not be associated with an academic listening experience, as the following quote shows:

Quote/7.9
'I don't think the second interpretation is important in academic listening.' (J3)

In addition, as Table 7-4 shows, based on an excerpt taken from a literature lecturer interview, the four judges rated four codes highly; two codes at 100% and two at 75%. Only one code received low agreement (50%). The low-rated code (Q3c/1) was 'multitask well (reading a written word on the board while listening)' despite the excerpt showing that the lecturer said 'I write a word on the board.'

Table 7-4: Judgement task 3 (C) rating

Quote	Target sub-processes	J1	J2	J3	J4	Agreement percentage	Comments
Q3c/1	Multitask well (Reading a written word on board while listening)	/	*Yes*	*No*	*Yes*	**50%**	'Extract does not clearly show this.' (J1)
Q3c/2	Overflow with high level words	*Yes*	*Yes*	*No*	*Yes*	**75%**	
Q3c/3	Use redundancy while listening (e.g. synonyms)	*Yes*	/	*Yes*	*Yes*	**75%**	'Not sure. It's not clear to me what the statement mean.' (J2)
	Present sub-processes						
Q3c/4	Dealing with speed	*Yes*	*Yes*	*Yes*	*Yes*	**100%**	
Q3c/5	Pull out from an empty reservoir of vocabulary	*Yes*	*Yes*	*Yes*	*Yes*	**100%**	

Based on the excerpt as a whole (Q3c), three judges rated it '4', tending to agree, and one rated it '5', further agreeing that the codes in the table captured sub-processes a listener needs to engage in or have difficulty with based on what has been said in the

excerpt from the literature lecturer interview. Two comments by two judges related to this judgement task are provided below:

Quote/7.10
'Some of these don't seem to talk about cognitive processes.' (J1)

Quote/7.11
'Quotes one and two "multitask well" and "overflow with high-level words" don't sound like cognitive process. Maybe you can review it as "understand with facilitative materials".' (J3)

Finally, based on Table 7-5 related to another excerpt from the literature lecturer interview, four judges agreed that three codes reflected the target sub-processes as demonstrated by their relevant quotes (100%), and three judges further agreed that four codes reflected the sub-processes as in the quotes (75%). Only one code (Q3d/4) was rated potentially low (25%), as three judges did not agree that the literature lecturer required her listeners to 'overflow with words' in order to comprehend a specific part based on what has been given in one of her lectures. The four judges further circled '4' regarding interpretation of the sub-processes included in Table 7-5 as a whole, and no feedback was provided on this task.

Table 7-5: Judgement Task 3 (D) rating

Quote	Target sub-process	J1	J2	J3	J4	Agreement percentage	Comments
Q3d/1	Interpret new unfamiliar ideas	*Yes*	*Yes*	*No*	*Yes*	**75%**	'What is the difference between Qsd:1 and Qsd:8?' (J3)
Q3d/2	Make a mental image of the things described	*Yes*	*Yes*	*Yes*	*Yes*	**100%**	
Q3d/3	Make quick connections and inference between ideas	*Yes*	*Yes*	*Yes*	*Yes*	**100%**	
Q3d/4	Overflow with words	*No*	*/*	*Yes*	*No*	**25%**	'It doesn't mean that there's an overflow.' (J1) 'Not sure' (J2) 'but also the students needed to recognize the differences between the demon and x, it's more about X' (J4)
Q3d/5	Pick up on English proper nouns (names of poets, characters, places, researchers, titles of novels, plays and poems.	*/*	*Yes*	*Yes*	*Yes*	**75%**	'I think this could be linking the knowledge of the world.' (J1) ' + to understand its meaning to

							understand the context.' (J2) 'Why do you use 'pick up' but not x?' (J3)
Q3d/6	Reactivate and attach old background (retrieval) to new heard input to understand	*Yes*	*Yes*	*No*	*Yes*	**75%**	'Is this background knowledge or word knowledge?' (J3)
Q3d/7	Relate a word or a term given in the L1 to what the lecturer is talking about in the L2	*Yes*	*Yes*	*Yes*	*Yes*	**100%**	
	Present sub-process						
Q3d/8	Interpret new unfamiliar ideas/input	*Yes*	*Yes*	*No*	*Yes*	**75%**	

7.4 Summary

This phase was designed with the aim of evaluating randomly selected data/codes from the previous phases and validating those findings before proceeding to the final phase of this study. In general — and as the quantitative data in this chapter show — Phase 4 verified the interpretations of the data (based on some selected excerpts and codes) generated from Phases 1–3 regarding target and present listening needs. The judges confirmed that the sub-processes that were identified in analyses from the first strand of the study were indeed sub-processes academic listeners needed in the study's research context. Qualitatively, the judges noted additional sub-processes (mainly higher-level ones) that could be added to the set of sub-skills identified in this study. Nevertheless, this process confirmed that the previous phases, where data were gathered and sequenced, revealed numerous lecture-listening sub-processes.

The next chapter (8) presents the final phase's findings and considers data gathered in Phases 1–4.

Chapter 8 Questionnaire analyses (Phase 5)

8.1 Introduction

Previously, Phase 1 analysed the corpus and discourse of five real audio-recorded lectures to identify target listening needs (Chapter 4), Phase 2 used stimulated recall with seven students to identify present listening needs (Chapter 5) and Phase 3 involved interviews with five lecturers and three students to establish listening targets, present needs and language-learning wants (Chapter 6). This was followed by Phase 4 which checked some sequenced findings collected from the previous qualitative phases (Chapter 7) before proceeding to the final quantitative phase described in this chapter.

This chapter reports Phase 5 findings based on a student questionnaire which targeted all three types of NAs addressed in this study (TSA, PSA, LCSA) and incorporated the previous phases' findings, in particular, target and present listening needs, as part of the data-sequencing NA methodology. Phase 5, therefore, forms the final part of this sequencing which helps to answer part of *RQ1e:* 'What do ELL undergraduates themselves perceive to be their target, present and language-learning academic cognitive listening needs?'

Section 8.2 describes Phase 5's methodology and Section 8.3 the findings. Finally, a summary is provided in Section 8.4.

8.2 Data collection and analysis

8.2.1 Administering a questionnaire

As in most quantitative investigations into NA (e.g. Kormos et al., 2002; Serafini et al., 2015), a lecture-listening needs questionnaire was used in this study. Questionnaires are amongst the most widely used instruments in L2 listening (e.g. Aryadoust, 2013; Zhang & Goh, 2006). For example, one popular listening comprehension questionnaire is the Metacognitive Awareness Listening Questionnaire developed by Vandergrift et al. (2006), which consists of 21 randomly ordered items in which respondents, such as L2 learners, can self-report their perceived use of strategies and processes regarding the regulation of listening in terms of problem-solving, planning and evaluation, mental translation, person knowledge and directed attention.

Brown (2001) defines questionnaires as 'any written instruments that present respondents with a series of questions or statements to which they are to react either by writing out their answers or selecting them from among existing answers' (p.6). Thus, questionnaires commonly contain two types of questions: open-ended questions, which allow respondents to write their answers in a blank space provided; and closed-ended questions, which can be answered by choosing from given options in several different formats, e.g. semantic differential scales, numerical rating scales, true-false, multiple-choice or, as in this study, rank order questions, in which a list of concepts is arranged according to a criterion, and a Likert scale, which is the most popular type, in which respondents indicate the extent of something (Dörnyei, 2003). A major advantage of questionnaires is that they enable the researcher to gather data from a large number of respondents in a short time and in a 'cost-effective' manner (Kormos et al., 2002, p.521). Nevertheless, Dörnyei (2003) warns that preparing a questionnaire requires careful development and that the design should be based on scientific principles, such as content based on theoretically driven concepts, careful writing of items avoiding ambiguous or leading questions, and piloting, even if most or all of the items are drawn from existing questionnaires.

In this study, the final version of the questionnaire (Appendix O) is divided into two sections. The first section includes 11 questions about personal information of the respondents, including their name, gender, age, nationality, email address, first language, whether they have an English native-speaker parent or regular contact with an English native speaker, current level of study, how long they have been studying English, and whether they spent a long period in an English-speaking country. The second section consists of two parts:

a) Part 1 of Section 2 *'Academic listening development'* has four questions about language-learning wants. The participants indicate on a five-point scale (from 1=very happy to 5=very unhappy) how happy they are with their overall level of listening comprehension when attending current course lectures (Q1). There is also a yes/no question about whether they would like to improve their academic listening (Q2), and an open-ended question asking if they want to study to improve their listening (Q3). A rank order question (Q4) in two parts is also included. In part 'Q4a', participants rank vocabulary, grammar

and pronunciation by importance and their willingness to improve them to help with listening. Part 'Q4b' includes a list of nine higher-level sub-skills. The participants choose three sub-skills they would like to improve the most and then rank them according to their importance.

b) Part 2 of Section 2 *'Academic listening needs and abilities'* aims to measure target and present needs, drawing mainly from the sub-processes identified in this study. This part contains 85 items in a two-column table: *Column A*, in which participants read and then rate a statement on a four-point scale (1=do not need to be able to, 2=rarely need to be able to, 3=usually need to be able to, 4=always need to be able to) at the stage of listening to lectures to identify target needs. Then, the participants go to *Column B* and think about the same statement and a four-point scale (1=can seldom/rarely, 2=can sometimes, 3=can usually, 4=can always) as to whether they can currently employ a given sub-process in order to identify present needs. Part 2 aims to measure participants' perceptions regarding listening processes and strategies (Table 8-1). To measure each individual component, multi-item scales (more than one item is included to tap into the same aspect) are used.

Table 8-1: The questionnaire construct

Questionnaire construct	No. of items	Item Nos.
Cognitive process		
Input decoding	9	1, 2, 3, 4, 5, 6, 7, 9, 13
Lexical search	12	14, 15, 17, 18, 19, 20, 21, 22, 23, 25, 79, 84
Parsing and propositional meaning	4	24, 26, 41, 44
Inferencing	11	27, 28, 29, 30, 31, 32, 36, 38, 39, 40, 43
Building a mental model	13	42, 45, 47, 48, 49, 50, 51, 52, 53, 55, 56, 57, 59
Creating a text-level representation	11	34, 35, 37, 46, 64, 66, 54, 58, 61, 62, 63
Creating an intertextual representation	11	60, 65, 72, 75, 76, 78, 80, 81, 82, 83, 85
Cognitive or metacognitive strategy		
Translation	2	8, 33
Inferencing	2	16, 77
Prediction	2	73, 74
Fixation	1	69
Pre-listening preparation	2	67, 68
Directed attention	3	10, 11, 12
Comprehension monitoring	2	70, 71

Piloting

The questionnaire was developed based on findings from previous phases, and discussed with the researcher's supervisor. To gain insights into the questionnaire's construct validity, it was given to a British English language teacher who has experience with

low-level students, especially from the Middle East. This teacher was asked to comment on the clarity of the statements (for example, she provided the comment in Figure 8-1.

4. Start with the subject-specific knowledge I have heard in class and use it when I work on assignments, exams and presentations.

   I am slightly uncertain about "start with". What do you mean here? Also when you say "class" do you mean lectures?

   In an ideal world, I would suggest: *Use subject-specific knowledge I have gained in class/lectures when doing assignments, exams and presentations.*

   However, although "gain" would be the best collocation for "knowledge," I feel that this item might confuse low level students. What do you think?

   To make it simpler, you could say: *Use ideas I have learned in class/lectures in assignments, exams and presentations.*

Figure 8-1: A comment on a draft questionnaire item

Additionally, the questionnaire was piloted with one Saudi student in the UK (in his first year at university) and another participant in Saudi Arabia (who had completed her degree in English at a university other than the one associated with this study). These pilot participants were asked to read the questions, state what they understood and provide feedback. The participants indicated that the questionnaire was a bit long and took about one hour to complete. Further, they found that many of their responses to statements in Column A were 'always' on the 'I need to be able to' scale. They suggested shortening long statements, providing the main study participants with an oral explanation on the four different 'grades' of 'need' and directing them to carefully consider the differences amongst these grades, providing examples (e.g. the main study participants should carefully consider whether they 'always need to be able to do that' (across all lectures) or 'usually need to be able to do that' (in most lectures)) to help them differentiate amongst the scale points, and explaining at random some questionnaire statements in the students' L1 during the questionnaire's distribution to clarify what I expected them to do. These recommendations from piloting were implemented.

Participants and procedure

Two hundred and five students from the ELL Department completed the questionnaire. The students ranged in age from 18–30 years (M=21.08). Almost all students, 192, were Saudi, two were Syrian, ten were Yemeni and one was Algerian. Arabic was each

participant's L1, and none had a parent who is a native English speaker. Forty-three students reported having contact with an English speaker (five said with a relative, four with a tutor, 26 with friends and eight said other). Their years of studying English ranged between 1–21 (M=9.80). Twenty-two students had spent a long period (at least three months) in an English-speaking country (nine in the UK, ten in the US, two in Australia and one in Canada). Their lengths of stay were between three months and nine years. Two students had spent long periods in two English-speaking countries. The participants were in their first (67), second (70) or third (68) year of study. To gain an idea of the participants' listening proficiency, I administered an IELTS listening test from a commercial Cambridge IELTS practice book (Appendix P). The mean of their IELTS listening score was 23.26 out of 41 (SD = 7.0) (see Figure 8-2).

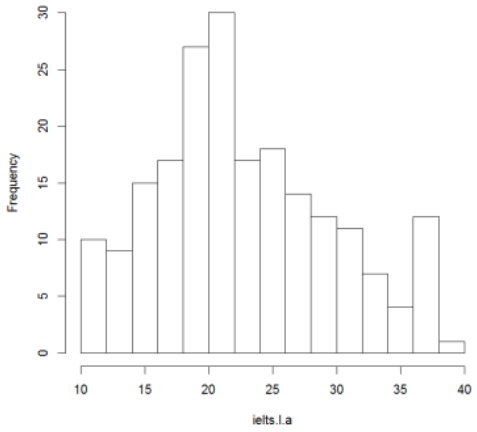


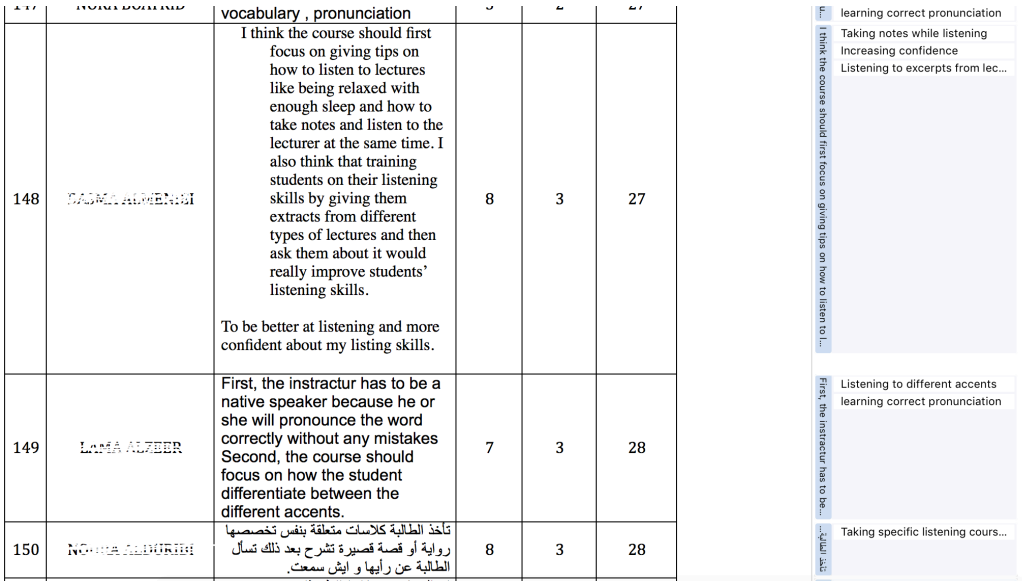
Figure 8-2: Distribution of IELTS scores

The main study's questionnaire was administered in English, at the research site. Because the participants are students in an English department, I expected them to be able to understand the questions quite well. Most of the words were easy to understand, based on experience with a pilot participant who scored 4.5 on IELTS. Also, because the students were also attending lectures in Arabic while studying in the department, I was worried that they would be confused about the focus of the questionnaire, as this questionnaire is concerned only with listening to lectures in English. Further, I was at the research site and asked the students, especially those at lower levels, if there were words they did not understand. Thus, I thought it best to use the English questionnaire.

Lecturers helped me recruit participants and administer my instruments during their classes. In other cases, students completed the questionnaires on their own time and then returned them to me.

Analysis

First, to analyse the open-ended question (Part 1, Q3) responses qualitatively, I prepared a table with five columns: name, comment, level, year of study and listening score, and I filled it with data from the questionnaires (example in Figure 8-3). This was imported into Atlas.ti and then I assigned codes to these extracts based on codes from all previous phases. Most codes were straightforward, as the answers were direct and short. Sometimes, the participants wrote general responses that were coded as 'general comments'. While presenting the results, selected quotes in English were included as they were (without correcting language errors), and quotes in Arabic were translated into English. For further quotes included as images, see Appendix N.



	[redacted]	vocabulary , pronunciation			
148	[redacted]	I think the course should first focus on giving tips on how to listen to lectures like being relaxed with enough sleep and how to take notes and listen to the lecturer at the same time. I also think that training students on their listening skills by giving them extracts from different types of lectures and then ask them about it would really improve students' listening skills. To be better at listening and more confident about my listing skills.	8	3	27
149	[redacted]	First, the instractur has to be a native speaker because he or she will pronounce the word correctly without any mistakes Second, the course should focus on how the student differentiate between the different accents.	7	3	28
150	[redacted]	تأخذ الطالبة كلاسات متعلقة بنفس تخصصها رواية أو قصة قصيرة تشرح بعد ذلك تسأل الطالبة عن رأيها و ايش سمعت.	8	3	28

Figure 8-3: Open-ended question data sample

Second, to explore the students' perceptions of listening needs, descriptive statistics, namely frequencies and percentages, were calculated for all questions using IBM SPSS (Q4 in Part 1 and Columns A and B in Part 2).

Third, factor analysis was performed, using R, to confirm the latent structure of the variables. Factor analysis 'reduces the number of variables submitted to the analysis to a few that still contain most of the information found in the original variables' (Hatch & Lazaraton, 1991 as cited in Dörnyei, 2001, p.219). The sample size in this study (205 participants) was relatively small for the purposes of CFA. However, Field (2013) suggests that there is little empirical basis to rules of thumb regarding the ratio of cases to variables. Field suggests that absolute sample size (meaning the number of participants) is a more important measure. Tabachnick and Fidell (2012) and Comery and Lee (1992) suggest that a sample size of 300 is appropriate for factor analysis. While the 205 completed questionnaires do not quite satisfy that criterion, they do far exceed the threshold of 100 considered poor by Comery and Lee (1992). In summary, it was felt that it would be more meaningful to apply Principal Component Analysis (PCA) to these data. PCA was not conducted to generalise the findings to a population or test a hypothesis; rather, I wanted to explore and arrange the data into a set of linear components (based on Field, 2012, p.674) underlying the questionnaire items.

PCA requires multivariate normal data, which means that all observed variables must have approximately normal distributions. Questionnaire data, particularly where there may be ceiling and floor effects for items and they are collected in only a few ordinal categories (a four-point Likert scale in this study), will rarely have a normal distribution. To apply factor analysis we need to transform the data into a normal set. Pearson's correlation is used for factor analysis by default in the majority of statistical packages. However, it assumes interval level measurement. Polychoric correlation, on the other hand, offers a method to free ordinal data from the restriction of interval measurement and be assessed as truly ordinal variables (Field, 2013). This has been shown to reproduce an underlying measurement model more accurately than Pearson's correlation (Holgado-Tello, 2010). Moreover, regardless of the sample size or true population correlation, it has been found to be the most robust estimator of correlation for Likert-scale-type data (Jöreskog & Sörbom, 1996).

Polychoric correlation calculates a measure of correlation under the assumption of an underlying normal distribution for a pair of variables. With this technique we can create a correlation matrix with which to run factor analysis. Thus, this technique was opted for in this study. More specifically, a polychoric correlation matrix was calculated using the

'polycor' package (Fox, 2010) in R. PCA was run via the 'principal' function in the 'psyche' package (Revelle, 2015), a collection of functions used for psychometric analysis in R.

Maximum Likelihood Oblimin rotations were used, since it was expected that there would be some correlation between components (Field, 2012). On inspection, some items from both analyses (A and B) had low correlations with other items, making them unsuitable for PCA. This manifests itself in low values for Kaiser-Meyer-Olkin (KMO). In order to produce a data set more suitable for PCA variables which showed little correlation with others, the sums of squared correlations were removed (Field, 2012). For the set of questions in A, 29 items were removed, leaving 56 in the data set. For B, 11 items were removed, leaving 74 (Appendix Q). For this algorithm, the removal of unsuitable data points was justified by the fact that the length of the questionnaire made it very difficult to remove low correlation variables by eye, as suggested by Field (2012, p.781). After removal, the KMO values for the data sets were acceptable.

Experimentation was done using various criteria for the number of components to extract. Kaiser's criterion (Pallant, 2010) of extracting all components above 1 eigenvalue produced too many components to be interpretable. The criterion for extracting components occurring before the 'elbow' in the scree plot, conversely, left too few components to be meaningful. The a priori criterion of matching the number of components to the number theorised by the qualitative research (six) gave the most satisfactory solution when balancing interpretability with statistical robustness. Aryadoust et al.'s (2012) model, used in this study, extracted six components from 47 questionnaire items. Thus, since I have similar numbers of items to Aryadoust et al.'s questionnaire that load onto factors (48 for Set A, 52 for set B), six components, as found by Aryadoust et al., seems a reasonable number, especially as the six components extracted seemed to make more sense than the other solutions. Cronbach's alpha for each component was calculated by extracting those components which loaded above the critical value of .364 (a significant loading for this particular sample size; Stephens, 2002 as cited in Field, 2012), then calculating the coefficient of reliability for those items.

8.3 Questionnaire findings

Overall, the analysis provides the views of 205 ELL students. The majority of participants said they were satisfied with their listening skills. The participants mentioned 30 listening sub-skills they would like to work on, but increasing their vocabulary seemed to be more important to them. The participants also seemed to attach more significance to higher-level processes, particularly building a mental model and creating a text-level representation, because as target needs the top sub-skills generally belong to these two processes. However, the participants felt that they had challenges in relation to both lower- and higher-level processes. The factor analyses resulted in six major sub-skills (components) based on Column A and six major sub-skills (components) based on Column B.

The participants' perceptions of language-learning listening wants are presented in Section 8.3.1, the target and present listening needs, based on descriptive statistics, in Section 8.3.2, and the factor analyses in Section 8.3.3, as detailed below.

8.3.1 Language-learning listening wants

The questionnaire explored the students' perceptions of their language-learning listening 'wants' vis-à-vis four issues:

1. Students' overall happiness level for their current understanding of lectures

Students rated their listening comprehension ability level when listening to current course lectures (Part1/Q1). Figure 8-4 shows a five-item happiness rating scale, where the largest grouping of participants (41%), 83 out of 205, perceived themselves as '2=happy'; the mean IELTS listening score of these participants was 24.35 out of 41. Meanwhile, 12% of participants (25) indicated that they felt '1=very happy'; their test score mean was 32.62. Around 38% of participants (77), whose test score mean was 20.84, chose '3=neutral', indicating that they had neither negative nor positive feelings towards their lecture listening comprehension level, or were unable to decide. Only 8% of participants (7) rated their lecture comprehension as '4=unhappy', suggesting that they might experience several comprehension problems. Their mean test score was 16.82. No one chose the '5=very unhappy' option, although this might reflect the fact

that unhappy/ dissatisfied students had already dropped out of the course.

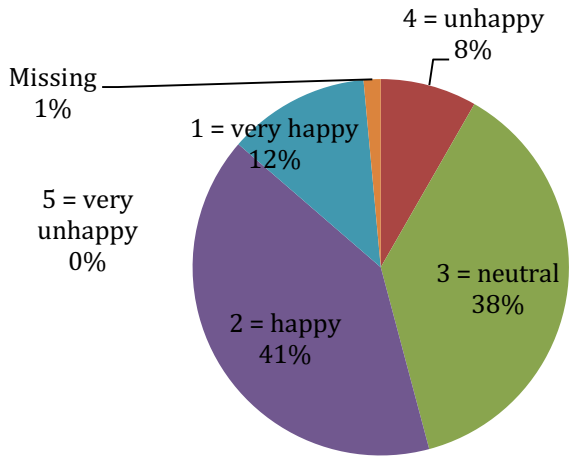


Figure 8-4: Overall academic listening happiness

2. Students' willingness to improve their academic listening

As can be seen in Figure 8-5, when the students were asked about their willingness to improve their academic listening (Part1/Q2), 96% of them (197), whose listening test score mean was 23.15, said that they wanted to improve their academic listening, if given the opportunity to take an academic listening course. Meanwhile, only 3% of the participants indicated that they did not want to improve their listening. Perhaps these seven participants thought they were already good enough, as their higher mean listening score of 27.71 suggests to some extent, and thus they may have felt they did not need to take such a course.

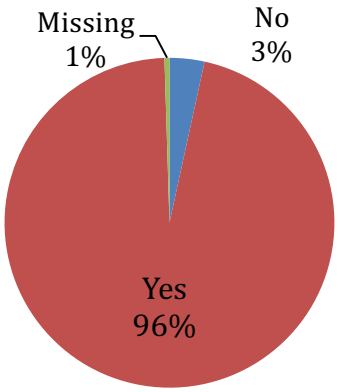


Figure 8-5: Willingness to improve academic listening

3. Students' language-learning listening wants (open-ended question)

The analyses of the responses to the question 'If you were given the opportunity to take a course to develop your academic listening skills, what do you think the course should focus on to help you improve your academic listening ability?' (Part1/Q3), resulted in a total of 30 wants, shown in Table 8-2.

Table 8-2: Language-learning listening needs

What a student wants to learn	N	What a student wants to learn	N
Learning more (general, academic, high-level) vocabulary	66	Understanding theoretical information without examples	4
Listening integrated with speaking	38	Extracting key words/specific information	3
Listening to different accents	31	Developing vocabulary strategies	3
Recognising sounds clearly in connected speech	20	Differentiating between one point and another	2
Listening to speech at different speeds	17	Concatenating words as ideas	2
Taking notes while listening	16	Inferring implicit meaning	2
Concentrating while listening for a long time	11	Identifying the general idea	2
Understanding from first listening	9	Generating questions while listening	2
Learning grammar	9	Dealing with poorly presented content	1
Taking specific listening courses related to literature/linguistics	7	Increasing confidence in listening ability	1
Learning how to link sentences/ideas together	6	Dealing with incomprehensible parts of input	1
Engaging in reading	5	Predicting questions for exams	1
Listening integrated with reading	4	Understanding an oral material deeply	1
Increasing general knowledge	4	Understanding details	1
Distinguishing between what is important from what is not	4	Very general comments (do not belong to any code)	29
		Missing	9

Of the participants, 23.19% (66 out of 205) thought that learning or increasing their vocabulary might develop their academic listening. Some participants 'simply' suggested vocabulary, while others also specified particular types of lexis. For example:

Quote/8.1
There should be listening courses for each level of study, for example, in level one we study easier vocabulary, then in level two we study more difficult words and so on. (P95/6/2/22) [28]

Nineteen participants specified that the course should specifically teach academic terminology or subject-specific vocabulary, as exemplified by the following comment:

Quote/8.2
'I think my problem with academic listening in the university is vocabulary. Lacking vocabulary is my worst nightmare. For me, pronunciation and grammar are not issues for understanding what I hear, but vocabulary is. So it would be great if I have the chance to increase my academic vocabulary in order to develop the listening'. (P164/8/3/30)

Some participants commented that they would also prefer such academic vocabulary to be taught in their L1 at the same time.

Quote/8.3
I want to link English terminologies to Arabic, this also needs to include explanation of terms in Arabic with examples. (P48/4/1/18)

Finally, 13 comments expressed a desire to learn difficult/high-level lexis. While it is not clear what exactly is meant by 'difficult and high-level' vocabulary here, it may refer to academic or subject-specific vocabulary. For example, a participant wrote:

Quote/8.4
'In vocabulary, the high-level vocabulary'. (P78/8/3/20)

Some learners specified the need to learn 'long words':

Quote/8.5
…and also it needs to include teaching new words, especially words containing more than one syllable. (P93/8/3/22)

[28] Participant given number/level/year/listening score

The second most frequently mentioned 'want' concerned integrated listening and speaking. Thirty-eight out of 205 respondents (18.53%) believed that listening integrated with speaking might be beneficial to developing their academic listening. The participants tended to use words such as 'discussion', 'conversation', 'debate', 'interaction' and 'speaking' to refer to the necessity to link listening to speaking. According to their responses, this generally involves discussions with other students, lecturers or a native speaker, on either general topics or academic topics related to their studies. This 'want' is illustrated in the following quote:

> ***Quote/8.6***
> 'Speaking! For that the more you speak the more you talk to people the more you listen to people. Also, communicating with other will help!. (P179/4/1/32)

The following quote, for example, emphasises the importance of formulating a reply during interactive listening, as doing so obliges the listener to listen closely and comprehend the speaker's words in order to give a response.

> ***Quote/8.7***
> To have students, during studying at the department, engage in discussion sessions in which an important topic is discussed between students, and then each student has to participate. This would help the student to be forced to listen to others and try to assimilate [ideas] as much as he/she can, so the student can respond and clarify her viewpoint. This would help enhance both listening and speaking, and this also seems to occur as natural practice. (P91/7/3/22)

The next three most frequently mentioned 'wants' are associated more with aspects of phonology: 1) accents, 2) speech rate or speed and 3) phonological features of words, such as assimilation, dissimulation and elision (pronunciation). Of the 205 participants, 31 (15.12%) expressed a desire for listening to a wide range of accents. Most participants did not mention which accents they would like to be included in a course (except for two comments about British English and two about listening to different nationalities). Instead, they generally suggested 'different', 'new' or 'varied' accents, which suggests exposure to accents other than those they are unfamiliar with or accents distinct from those of their current lecturers, who are mostly NNSs:

> ***Quote/8.8***
> 'I hope the course would focus more on the pronunciation of some words, especially to when it comes to the way they are pronounced in American and British English'. (P176/8/3/32)

As a further aspect of auditory input, 20 respondents (9.75%) were concerned with learning to recognise specific sound features in connected speech. Some of this refers to the 'sandhi variation' in phonology, wherein issues like phonemic assimilation and reduction may slur words' pronunciation (Bejar et al., 2000, p.16). Quotes related to this are as follows:

> ***Quote/8.9***
> I wish I could be taught the words that are shortened in speech, and some of their letters are not pronounced or unclear during speaking. (P55/6/2/19)

> ***Quote/8.10***
> 'Phonology, while listening to how the words are pronounced as well as stress, intonation, tone, during phonology class. It will improve the listening skill because you will be aware about these phonological features that will lead to a better listening'. (P126/8/3/24)

In addition, 17 participants (8.29%) commented that being trained to listen to speech delivered at different speeds is important:

> ***Quote/8.11***
> 'Understanding lecturers who speak fast, ...'. (P32/4/1/16)

Another 'want', expressed by 16 participants (7.80%), concerned developing note-taking:

> ***Quote/8.12***
> 'To know how to write notes and listen to lecture at the same time'. (P61/6/2/20)

Eleven participants (5.36%) mentioned developing concentration while listening, especially during long lectures:

> ***Quote/8.13***
> ' … but if I were to take such a course I would like it to focus on concentration and how do we stay focused for long period of time'. (P195/6/2/37)

Several other 'wants' were specified, but less than ten times for each one. These include: improving the ability to listen and understand quickly on a first hearing, without listening again or mentally translating into L1; learning syntactic rules; taking an ESAP listening course covering materials similar to those encountered in their department, such as listening to philosophical works, plays, poems, novels and short stories;

improving the ability to link words and sentences together as presented in lengthy oral texts, and linking key points to their elaborations in the form of examples; reading courses in general to improve listening.

'Wants' related to aural comprehension identified by fewer than five comments include: listening integrated with reading (particularly listening to audiobooks and listening while reading PowerPoint slides); increasing general knowledge; distinguishing relevant from irrelevant information; comprehending theoretical academic materials without being provided with examples; extracting key words and specific information; being able to relax and focus on the general idea, i.e. gist, without worrying about understanding every single word; understanding each point separately; improving vocabulary strategies, e.g. guessing the meanings of unfamiliar words; inferring implicit information; identifying the main points; identifying a lecture's general idea; generating questions during listening; dealing with poorly explained content; increasing their confidence in their listening ability; dealing with misunderstood information; predicting questions for examinations; understanding oral materials fully; paying attention to detail.

4. Language-learning listening wants (rank-order questions)

When participants were required to rank-order 'vocabulary', 'grammar' and 'pronunciation' according to what they would like to learn to help with developing listening (Part1/Q4a), as shown in Table 8-3, more than half of the participants (53.7%) thought that 'increasing my vocabulary' 'will help the most' if it is taught in an academic listening course. This was followed by 'improving my knowledge of how words are pronounced in normal-speed speech', which 38.5% of the participants thought 'will help the second most'. Finally, 'improving my knowledge of grammar' was considered 'will help the third most', as perceived by nearly half of the respondents (51.7%).

Table 8-3: Language-learning listening wants related to lower-level processes

Want	Scale from 1 to 3	Frequency (Percentage)
Increasing my vocabulary	1 = will help the most	110 (53.7%)
	2 = will help the second most	67 (32.7%)
	3 = will help the third most	26 (12.7%)
	Total	203 (99.0%)
	Missing	2 (1.0%)
Improving my knowledge of how words are pronounced in normal-speed speech	1 = will help the most	53 (25.9%)
	2 = will help the second most	79 (38.5%)
	3= will help the third most	71 (34.6%)
	Total	203 (99.0%)
	Missing	2 (1.0%)
Improving my knowledge of grammar	1 = will help the most	40 (19.5%)
	2 = will help the second most	57 (27.8%)
	3= will help the third most	106 (51.7%)
	Total	203 (99.0%)
	Missing	2 (1.0%)

Additionally, as Table 8-4, shows, participants were asked to choose the three most important sub-skills from nine sub-skills closely associated with lecture-listening (Part1/Q4b), and then rank-order those three according to their importance to them. Based on their mean rank order, the analysis shows that improving how to take notes (M=0.85) and learning how to remember most of the information in a lecture (M=0.85) are generally perceived by the students as the most desirable sub-skills to improve in a course. This was followed by learning how to link ideas together to get a complete overview of the entire lecture (M=0.77) (the second most wanted sub-skill), whereas the willingness to integrate information from different sources while listening (M=0.69) appeared to be the third most wanted sub-skill to learn from a lecture-listening course.

In comparison, sub-skills such as understanding different English accents (M=0.54) and increasing general world knowledge (M=0.52) were thought to be comparatively less useful amongst this list of nine sub-skills, in terms of helping with lecture-listening, as nearly three-quarters of the respondents (73.2% and 74.1% of participants, respectively) did not select these two sub-skills at all.

Table 8-4: Language-learning listening wants related to higher-level processes

Want	Scale from 0 to 3	Frequency (Percentage)	Mean	SD
Improving how I take notes about important ideas	0 = has not been chosen	117 (57.1%)	**0.85**	1.10
	1 = will help the most	26 (12.7%)		
	2 = will help the second most	36 (17.6%)		
	3 = will help the third most	25 (12.2%)		
	Total	204 (99.5%)		
Learning to remember most of the information	0 = has not been chosen	120 (58.5%)	**0.85**	1.15
	1 = will help the most	27 (13.2%)		
	2 = will help the second most	26 (12.7%)		
	3= will help the third most	32 (15.6%)		
	Total	205 (100.0%)		
Learning how to link different ideas together to get a complete overview of the entire lecture	0 = has not been chosen	126 (61.5%)	**0.77**	1.10
	1 = will help the most	21 (10.2%)		
	2 = will help the second most	31 (15.1%)		
	3= will help the third most	25 (12.2%)		
	Total	204 (99.5%)		
Improving my ability to integrate information from different sources while listening to the lecturer	0 = has not been chosen	137 (66.8%)	**0.69**	1.09
	1 = will help the most	22 (10.7%)		
	2 = will help the second most	19 (9.3%)		
	3= will help the third most	27 (13.2%)		

	Total	205 (100.0%)		
Improving how I distinguish important from non-important	0 = has not been chosen	147 (71.7%)	**0.62**	1.07
	1 = will help the most	13 (6.3%)		
	2 = will help the second most	19 (9.3%)		
	3= will help the third most	25 (12.2%)		
	Total	204 (99.5%)		
Learning how to identify the central ideas and details	0 = has not been chosen	142 (69.3%)	**0.58**	.97
	1 = will help the most	25 (12.2%)		
	2 = will help the second most	21 (10.2%)		
	3= will help the third most	17 (8.3%)		
	Total	205 (100.0%)		
Learning how to concentrate for a long time	0 = has not been chosen	139 (67.8%)	**0.56**	.93
	1 = will help the most	32 (15.6%)		
	2 = will help the second most	19 (9.3%)		
	3= will help the third most	15 (7.3%)		
	Total	205 (100.0%)		
Understanding different English accents	0 = has not been chosen	150 (73.2%)	**0.54**	.99
	1 = will help the most	18 (8.8%)		
	2 = will help the second most	18 (8.8%)		
	3= will help the third most	19 (9.3%)		
	Total	205 (100.0)		
Increasing my general informational knowledge about the world and people	0 = has not been chosen	152 (74.1%)	**0.52**	.99
	1 = will help the most	20 (9.8%)		
	2 = will help the second most	12 (5.9%)		
	3= will help the third most	21 (10.2%)		
	Total	205 (100.0%)		

8.3.2 Descriptive statistics for target and present listening needs

This section presents the descriptive statistics for all of the questionnaire items (Part 2, Columns A and B) categorised according to the study model's processes and strategies (see 2.3.3). This was done to match the processes and strategies from the quantitative data with the previous qualitative phases. Within each process or strategy, the statements were ordered from the highest mean score to the lowest (the closer the mean is to 4, the more students think they need it) in relation to the target, based on a four-point Likert scale of how often they need to be able to do something (Column A). The statements

were also ordered from the lowest mean to the highest (the closer the mean is to 1, the more students felt they struggled) in relation to present needs, on a four-point Likert scale of whether they can or cannot do something (Column B).

8.3.2.1 Lower-level cognitive processes

1. **Input decoding**

Target needs

Table 8-5, shows that almost all the participants (94.2%) feel that they 'always' or 'usually' need to notice words as connected ideas while listening. Three-quarters of the participants also say they 'always' or 'usually' need to notice the pronunciation of new words, understand their classmates when talking in English, recognise all the words they know spoken by the lecturer, understand why lecturers emphasise some words/phrases, and distinguish questions that need answers from rhetorical questions.

In comparison, other input decoding sub-skills seem to be rarely needed. Less than half of the participants feel that distinguishing between phonological features (e.g. stress) in phonology and phonetics classes and understanding different English accents are important, while two-thirds say that understanding lecturers who speak (too) fast is also 'not' or 'rarely' needed.

Table 8-5: Input decoding, Column/A

Item no. (questionnaire)	Item	Mean	Frequency (percentage)			
			Do not need to be able to (1)	Rarely need to be able to (2)	Usually Need to be able to (3)	Always need be able to (4)
1	Notice words as connected ideas	3.40	1 (.5%)	11 (5.4%)	99 (48.3%)	94 (45.9%)
3	Notice the lecturers' pronunciation of new words	3.32	4 (2.0%)	31 (15.1%)	66 (32.2%)	104 (50.7%)
9	Understand my classmates when they talk in English	3.23	9 (4.4%)	35 (17.1%)	61 (29.8%)	100 (48.8%)
2	Recognize all the words I know that are spoken by the lecturer	3.19	12 (5.9%)	22 (10.7%)	87 (42.45)	84 (41.0%)
6	Understand why lecturers emphasize some words or phrases when they talk generally	3.11	5 (2.4%)	43 (21.0%)	81 (39.5%)	76 (37.1%)
13	Distinguish between questions that need answers from questions that do not (rhetorical questions)	3.04	7 (3.4%)	47 (22.9%)	81 (39.5%)	70 (34.1%)
7	Distinguish between phonological features (e.g. stress, intonation, tone) in phonology and phonetics classes	2.66	31 (15.1%)	59 (28.8%)	63 (30.7%)	52 (25.4%)
5	Understand different English accents	2.65	24 (11.7)	69 (33.7)	67 (32.7)	45 (22.0)
4	Understand lecturers who speak (too) fast	2.19	44 (21.5%)	92 (44.9%)	56 (27.3%)	13 (6.3%)

Present needs

In Table 8-6, nearly two-thirds of the participants struggle with understanding lecturers who speak (too) fast, half say they struggle with distinguishing between phonological features in phonology classes, and nearly half say that understanding different English accents also seems difficult.

Also, almost only one-third of the participants feel that what is difficult to handle is noticing words as connected ideas, distinguishing between questions that need answers from questions that do not, recognising all known words they hear and noticing the pronunciation of new words. Less than one-third of the participants feel that understanding why lecturers emphasise certain words/phrases when talking and understanding other students' speech are the least difficult of the input-decoding sub-skills included here.

Table 8-6: Input decoding, Column/B

Item no. (questionnaire)	Item	Mean	Frequency (percentage)			
			Can seldom /rarely (1)	Can sometimes (2)	Can usually (3)	Can always (4)
4	Understand lecturers who speak (too) fast	2.21	39 (19.0%)	95 (46.3%)	59 (28.8%)	12 (5.9%)
7	Distinguish between phonological features (e.g. stress, intonation, tone) in phonology and phonetics classes	2.60	19 (9.3%)	84 (41.0%)	61 (29.8%)	41 (20.0%)
5	Understand different English accents	2.72	17 (8.3%)	72 (35.1%)	67 (32.7%)	49 (23.9%)
1	Notice words as connected ideas	2.73	14 (6.8%)	62 (30.2%)	94 (45.9%)	35 (17.1%)
13	Distinguish between questions that need answers from questions that do not (rhetorical questions)	2.83	15 (7.3%)	60 (29.3%)	74 (36.1%)	56 (27.3%)
2	Recognize all the words I know that are spoken by the lecturer	2.95	7 (3.4%)	50 (24.4%)	95 (46.3%)	53 (25.9%)
3	Notice the lecturers' pronunciation of new words	2.95	7 (3.4%)	55 (26.8%)	84 (41.0%)	59 (28.8%)
6	Understand why lecturers emphasize some words or phrases when they talk generally	3.05	12 (5.9%)	40 (19.5%)	79 (38.5%)	74 (36.1%)
9	Understand my classmates when they talk in English	3.36	3 (1.5%)	26 (12.7%)	70 (34.1%)	106 (51.7%)

2. Lexical search

Target needs

As Table 8-7 shows, almost all the participants (94.6%) feel that they 'always' or 'usually' need to identify specific information (e.g. due dates) to do with the course. Also, over two-fifths of the participants consider that they 'always' or 'usually' need to learn vocabulary and its pronunciation, understand many words, recognise English names, focus on key words, and recognise technical terms and their definitions while listening in their TLU.

Lexical search sub-skills that appear to be the least needed, compared to the other lexical search sub-skills found here, include the need to understand what the lecturer is talking about if key words and ideas are not presented on lecture slides or a whiteboard, recognise synonyms, use the grammatical structures of new words, understand many high-level words and relate words or terms given in Arabic to what the lecturer is saying in English.

Table 8-7: Lexical search, Column/A

Item no. (questionnaire)	Item	Mean	Frequency (percentage)			
			Do not need to be able to (1)	Rarely need to be able to (2)	Usually Need to be able to (3)	Always need be able to (4)
22	Identify information about my course such as due dates and exams given by lecturers	3.69	3 (1.5%)	8 (3.9%)	39 (19.0%)	155 (75.6%)
84	Learn vocabulary and pronunciation from lecturers	3.48	4 (2.0%)	20 (9.8%)	54 (26.3%)	127 (62.0%)
14	Understand the meaning of many words in English	3.47	5 (2.4%)	16 (7.8%)	61 (29.8%)	123 (60.0%)
21	Recognize the names of poets, characters, researchers, places, titles of novels, plays and poems	3.40	-	21 (10.2%)	81 (39.5%)	103 (50.2%)
19	Focus on key words	3.34	4 (2.0%)	25 (12.2%)	74 (36.1%)	102 (49.8%)
17	Recognize technical terms	3.20	1 (.5%)	33 (16.1%)	94 (45.9%)	77 (37.6%)
18	Understand the definitions of technical terms	3.20	6 (2.9%)	29 (14.1%)	87 (42.4%)	83 (40.5%)
79	Understand what the lecturer is talking about if key words and ideas are not presented on lecture slides or the whiteboard	2.94	9 (4.4%)	53 (25.9%)	84 (41.05)	59 (28.8%)
20	Recognize that the lecturer is using a synonym of a word I do not know	2.92	6 (2.9%)	59 (28.8%)	85 (41.5%)	55 (26.8%)
25	Use the grammatical structure of a new word to help me understand it	2.87	13 (6.3%)	52 (25.4%)	89 (43.4%)	51 (24.95)
15	Understand many high-level words	2.80	10 (4.9%)	59 (28.8%)	99 (48.3%)	37 (18.0%)
23	Relate a word or a term given in Arabic to what the lecturer is saying in English	2.58	14 (6.8%)	88 (42.9%)	73 (35.6%)	30 (14.6%)

Present needs

In Table 8-8, a majority of the participants (71.3%) say that understanding many high-level words is challenging during lecture-listening. Further, slightly more than half of the participants feel that it is 'usually' or 'always' problematic to use the morphological structure of a new word to understand it and recognise synonyms and technical terms. Less than half the participants say that understanding the definitions of technical terms and knowing key words are 'usually' or 'always' hard sub-skills to utilise. Over a third feel that they have some difficulty in understanding English proper nouns, while slightly fewer feel that understanding 'many' English words is 'usually' or 'always' a hurdle for them.

Conversely, there are some lexical search sub-skills for which students expressed less difficulty, namely, knowing key words, relating a translated word to surrounding speech, learning vocabulary and pronunciation from lectures, and identifying specific information.

Table 8-8: Lexical search, Column/B

Item no. (questionnaire)	Item	Mean	Frequency (percentage)			
			Can seldom /rarely (1)	Can sometimes (2)	Can usually (3)	Can always (4)
15	Understand many high level words	2.05	56 (27.3%)	91 (44.4%)	49 (23.9%)	9 (4.4%)
25	Use the grammatical structure of a new word to help me understand it	2.52	21 (10.2%)	86 (42.0%)	69 (33.7%)	29 (14.1%)
20	Recognize that the lecturer is using a synonym of a word I do not know	2.54	17 (8.3%)	91 (44.4%)	67 (32.7%)	30 (14.6%)
17	Recognize technical terms	2.54	19 (9.3%)	85 (41.5%)	72 (35.1%)	29 (14.1%)
18	Understand the definitions of technical terms	2.58	16 (7.8%)	79 (38.5%)	86 (42.0%)	24 (11.7%)
79	Understand what the lecturer is talking about if key words and ideas are not presented on lecture slides or the whiteboard	2.59	23 (11.2%)	74 (36.1%)	72 (35.1%)	36 (17.6%)
21	Recognize the names of poets, characters, researchers, places, titles of novels, plays and poems	2.88	20 (9.8%)	53 (25.9%)	63 (30.7%)	69 (33.7%)
14	Understand the meaning of many words in English	2.96	4 (2.0%)	47 (22.9%)	107 (52.2%)	47 (22.9%)
19	Focus on key words	3.01	3 (1.5%)	61 (29.8%)	72 (35.1%)	69 (33.7%)
23	Relate a word or a term given in Arabic to what the lecturer is saying in English	3.13	6 (2.9%)	41 (20.0%)	78 (38.0%)	80 (39.0%)
84	Learn vocabulary and pronunciation from lecturers	3.25	5 (2.4%)	28 (13.7%)	83 (40.5%)	89 (43.4%)
22	Identify information about my course such as due dates and exams given by lecturers	3.51	2 (1.0%)	26 (12.7%)	42 (20.5%)	135 (65.9%)

3. Parsing and propositional meaning

Target needs

In Table 8-9, almost three-quarters of the participants say that they ‘usually’ or ‘always’ need to completely understand each idea presented in a lecture, and three-quarters say they need to connect words to make short, single phrases while listening. Slightly more than half of the participants feel that understanding what a lecturer is saying without using previous knowledge about the topic is ‘usually’ or ‘always’ necessary, while around half of the participants feel this is important for understanding grammatically complex language.

Table 8-9: Parsing, Column/A

Item no. (questionnaire)	Item	Mean	Frequency (percentage)			
			Do not need to be able to (1)	Rarely need to be able to (2)	Usually Need to be able to (3)	Always need be able to (4)
44	Completely understand each idea the lecturer is talking about	3.28	5 (2.4%)	21 (10.2%)	90 (43.9%)	89 (43.4%)
24	Connect words together to make a short, single phrase	3.06	3 (1.5%)	48 (23.4%)	87 (42.4%)	67 (32.7%)
41	Understand what a lecturer is saying without using my previous knowledge of the topic	2.64	20 (9.8%)	63 (30.7%)	93 (45.4%)	29 (14.1%)
26	Understand grammatically complex language	2.54	27 (13.2%)	72 (35.1%)	74 (36.1%)	32 (15.6%)

Present needs

Less than three-quarters of the participants feel that understanding complex grammatical structures is a hurdle, and slightly over half similarly for understanding what a lecturer is saying without using previous knowledge of the topic, since they 'rarely' or 'seldom' activate them successfully while listening. Likewise, slightly more than a third say that completely understanding each idea a lecturer expresses and connecting words together to make a short phrase are sub-skills that they can 'sometimes' or 'seldom' employ while listening.

Table 8-10: Parsing, Column/B

Item no. (questionnaire)	Item	Mean	Frequency (percentage)			
			Can seldom /rarely (1)	Can sometimes (2)	Can usually (3)	Can always (4)
26	Understand grammatically complex language	2.26	32 (15.6%)	101 (49.3%)	59 (28.8%)	13 (6.3%)
41	Understand what a lecturer is saying without using my previous knowledge of the topic	2.41	36 (17.6%)	75 (36.6%)	67 (32.7%)	27 (13.2%)
44	Completely understand each idea the lecturer is talking about	2.74	6 (2.9%)	66 (32.2%)	109 (53.2%)	24 (11.7%)
24	Connect words together to make a short, single phrase	2.87	6 (2.9%)	65 (31.7%)	83 (40.5%)	51 (24.9%)

8.3.2.2 Higher-level cognitive processes

1. Inferencing

Target needs

As shown in Table 8-11, more than three-quarters of the participants stated that the following inferencing sub-skills were 'usually' or 'always' needed while processing lectures: predicting answers to the lecturer's questions, connecting a piece of information that was presented earlier to another point in the same lecture to understand it, and identifying cues given to indicate something important. Almost two-thirds of the participants felt that the following were 'usually' or 'always' needed: world knowledge, recognising other students' wrong answers, establishing a lecture's content from the opening discussion, guessing what the lecturer is discussing in cases of non-clarity, understanding unfamiliar ideas, and linking literal and metaphorical meanings. Less common inferencing sub-skills described as 'not usually' or 'always' needed were: using local knowledge and working out implicit information.

Table 8-11: Inferencing, Column/A

Item no. (questionnaire)	Item	Mean	Frequency (percentage)			
			Can seldom /rarely (1)	Can sometimes (2)	Can usually (3)	Can always (4)
40	Predict answers to lecturer's questions	3.17	4 (2.0%)	30 (14.6%)	98 (47.8%)	73 (35.6%)
30	Connect a piece of information that was spoken earlier by the lecturer to another point given in the same lecture to understand the other point	3.14	3 (1.5%)	30 (14.6%)	108 (52.7%)	64 (31.2%)
39	Identify cues given in lectures to indicate something important	3.06	9 (4.4%)	32 (15.6%)	101 (49.35)	63 (30.7%)
28	Use my knowledge of the world and its people to help me understand the lecture	3.01	11 (5.4%)	45 (22.0%)	80 (39.0%)	69 (33.7%)
43	Recognize that another students answer is wrong	2.96	13 (6.3%)	46 (22.4%)	82 (40.0%)	64 (31.2%)
27	Establish what the lecture will be about from the discussion given at the beginning	2.91	11 (5.4%)	55 (26.8%)	80 (39.0%)	59 (28.8%)
38	Guess what the lecturer is talking about if the information is not entirely clear to me	2.81	14 (6.8%)	58 (28.3%)	86 (42.0%)	47 (22.9%)
31	Understand unfamiliar ideas	2.74	10 (4.9%)	71 (34.6%)	86 (42.0%)	38 (18.5%)
32	Link the literal and metaphorical meanings of ideas	2.74	13 (6.35)	68 (33.2%)	84 (41.0%)	40 (19.5%)
29	Use my knowledge of the Saudi or Arabic culture to understand ideas or examples conveyed by the lecturer	2.67	16 (7.8%)	78 (38.0%)	69 (33.7%)	42 (20.5%)
36	Work out information that is not explicitly spoken by the lecturer	2.52	16 (7.8%)	90 (43.9%)	76 (37.1%)	23 (11.2%)

Present needs

In Table 8-12, nearly two-thirds of the participants stated that working out implicitly-stated information and understanding unfamiliar ideas were difficult sub-skills to activate, which they can only do 'rarely' or 'sometimes'. Moreover, nearly half of the participants felt that they struggled with and only 'rarely' or 'sometimes' linked literal and metaphorical meanings, guessed unclear information, and predicted answers to questions.

Only one-third said that they could successfully get over the following hurdles 'rarely' or 'sometimes' while listening: recognise a student's wrong response, identify cues indicating importance, connect an earlier piece of information to another point in the same lecture, establish the lecture content from the opening discussion, and use world knowledge. Less than one-third said they had difficulty understanding local culture when processing lectures.

Table 8-12: Inferencing, Column/B

Item no. (questionnaire)	Item	Mean	Frequency (percentage)			
			Can seldom /rarely (1)	Can sometimes (2)	Can usually (3)	Can always (4)
36	Work out information that is not explicitly spoken by the lecturer	2.23	33 (16.1%)	106 (51.7%)	51 (24.9%)	15 (7.3%)
31	Understand unfamiliar ideas	2.35	29 (14.1%)	95 (46.3%)	62 (30.2%)	19 (9.3%)
32	Link the literal and metaphorical meanings of ideas	2.47	24 (11.7%)	86 (42.0%)	70 (34.1%)	25 (12.2%)
38	Guess what the lecturer is talking about if the information is not entirely clear to me	2.54	30 (14.6%)	71 (34.6%)	67 (32.7%)	37 (18.0%)
40	Predict answers to lecturers' questions	2.65	11 (5.4%)	85 (41.5%)	74 (36.1%)	35 (17.1%)
43	Recognize that another student's answer is wrong	2.79	10 (4.9%)	69 (33.7%)	80 (39.0%)	46 (22.4%)
39	Identify cues given in lectures to indicate something important	2.79	13 (6.3%)	68 (33.2%)	73 (35.6%)	51 (24.9%)
30	Connect a piece of information that was spoken earlier by the lecturer to another point given in the same lecture to understand the other point	2.81	8 (3.9%)	70 (34.1%)	79 (38.5%)	48 (23.4%)
27	Establish what the lecture will be about from the discussion given at the beginning	2.87	12 (5.9%)	61 (29.8%)	73 (35.6%)	59 (28.8%)
28	Use my knowledge of the world and its people to help me understand the lecture	2.99	8 (3.9%)	57 (27.8%)	70 (34.1%)	70 (34.1%)
29	Use my knowledge of the Saudi or Arabic culture to understand ideas or examples conveyed by the lecturer	3.27	7 (3.4%)	33 (16.1%)	62 (30.2%)	103 (50.2%)

2. Building a mental model

Target needs

As seen in Table 8-13, approximately 90 per cent of participants thought that in order to process lectures efficiently it is 'usually' or 'always' necessary to utilise sub-skills related to building a mental model, namely, identifying pronouns, recognising new information, identifying discourse markers and recognising key points.

Similarly, but to a lesser degree in comparison to the sub-skills mentioned above, over three-quarters of the participants felt that it is also 'usually' or 'always' necessary to understand examples, identify topics, recognise supporting details and differentiate between different ideas. Additionally, a little less than three-quarters also mentioned that the following sub-skills are essential: realising that not everything said by the lecturer conveys new information, and making judgements about what is important and what is not.

Almost half of the participants felt it was important to recognise a lecturer's personal opinion about an idea, identify irrelevant comments and understand the key points that might be presented in the first half of a lecture. However, they felt that these sub-skills were needed to a lesser degree than those mentioned here relating to building a mental model.

Table 8-13: Building a mental model, Column/A

Item no. (questionnaire)	Item	Mean	Frequency (percentage)			
			Do not need to be able to (1)	Rarely need to be able to (2)	Usually Need to be able to (3)	Always need be able to (4)
55	Identify who or what pronouns (he, she, it, they, him, their, etc.) refer to when the lecturer uses them.	3.56	2 (1.0%)	19 (9.3%)	46 (22.4%)	138 (67.3%)
52	Recognize new information.	3.54	-	14 (6.8%)	67 (32.7%)	124 (60.5%)
50	Identify when the lecturer is moving from one point to another	3.52	1 (.5%)	14 (6.8%)	67 (32.7%)	123 (60.0%)
47	Understand key points	3.49	1 (.5%)	13 (6.3%)	75 (36.6%)	116 (56.6%)
56	Understand the lecturer's examples to get the general idea (gist) of something	3.48	-	22 (10.7%)	63 (30.7%)	120 (58.5%)
45	Identify the topic of the lecture	3.41	3 (1.5%)	24 (11.7%)	63 (30.7%)	115 (56.1%)
48	Understand details that support key points	3.26	1 (.5%)	30 (14.6%0	89 (43.4%)	85 (41.5%)
49	Differentiate between a lecturer presenting main ideas, adding details or paraphrasing.	3.22	4 (2.0%)	27 (13.2%)	93 (45.4%)	81 (39.5%)
53	Realize that not everything said by the lecturer is giving new information.	3.04	7 (3.4%)	42 (20.5%)	92 (44.9%)	64 (31.2%)
42	Make judgements about what is important and not important when the lecturer is speaking.	3.02	11 (5.4%)	40 (19.5%)	87 (42.4%)	67 (32.7%)
57	Recognize when a lecturer is giving her personal opinion about an idea in a lecture.	2.97	6 (2.9%)	62 (30.2%)	69 (33.7%)	68 (33.2%)
51	Recognize comments made by the lecturer that are not relevant to the topic of the lecture.	2.84	18 (8.8%)	63 (30.7%)	58 (28.3%)	66 (32.2%)
59	Recognize that key points might be presented in the first half of the lecture	2.67	21 (10.2%)	64 (31.2%)	82 (40.0%)	38 (18.5%)

Present needs

In Table 8-14, slightly less than one-half of the participants said they had difficulty making judgements about the importance of an idea, recognising key points when presented in the first half of the lecture, differentiating between ideas and understanding details. They also indicated that they can 'rarely' or 'sometimes' utilise these skills.

Moreover, and compared to the sub-skills mentioned above, the following sub-skills were found to be less difficult, namely realising that not everything said is new information; only one-third said they can 'seldom' or 'sometimes' utilise that sub-skill. The participants also noted that recognising unrelated comments, identifying a lecturer's title and understanding key points are difficulties that they may 'seldom' or 'sometimes' face.

Conversely, identifying discourse markers, recognising a personal opinion, understanding examples, recognising new information and identifying pronouns were thought to be less difficult in comparison to the sub-skills mentioned above, as only a

few participants felt that they could 'rarely' or 'sometimes' utilise them successfully.

Table 8-14: Building a mental model, Column/B

Item no. (questionnaire)	Item	Mean	Frequency (percentage)			
			Can seldom /rarely (1)	Can sometimes (2)	Can usually (3)	Can always (4)
42	Make judgements about what is important and not important when the lecturer is speaking	2.71	22 (10.7%)	67 (32.7%)	65 (31.7%)	51 (24.9%)
59	Recognize that key points might be presented in the first half of the lecture	2.75	15 (7.3%)	74 (36.1%)	64 (31.2%)	52 (25.4%)
49	Differentiate between a lecturer presenting main ideas, adding details or paraphrasing.	2.79	9 (4.4%)	71 (34.6%)	79 (38.5%)	46 (22.4%)
48	Understand details that support key points	2.80	5 (2.4%)	68 (33.2%)	95 (46.3%)	37 (18.0%)
53	Realize that not everything said by the lecturer is giving new information	2.92	9 (4.4%)	63 (30.7%)	68 (33.2%)	65 (31.7%)
51	Recognize comments made by the lecturer that are not relevant to the topic of the lecture	2.96	11 (5.4%)	60 (29.3%)	60 (29.3%)	74 (36.1%)
45	Identify the topic of the lecture	2.99	10 (4.9%)	56 (27.3%)	65 (31.7%)	74 (36.1%)
47	Understand key points	3.01	3 (1.5%)	47 (22.9%)	100 (48.8%)	55 (26.8%)
50	Identify when the lecturer is moving from one point to another	3.23	5 (2.4%)	32 (15.6%)	79 (38.5%)	89 (43.4%)
57	Recognize when a lecturer is giving her personal opinion about an idea in a lecture	3.26	6 (2.9%)	34 (16.6%)	65 (31.7%)	100 (48.8%)
56	Understand the lecturer's examples to get the general idea (gist) of something	3.28	4 (2.0%)	29 (14.1%)	78 (38.0%)	94 (45.9%)
52	Recognize new information	3.29	1 (.5%)	28 (13.7%)	87 (42.4%)	89 (43.4%)
55	Identify who or what pronouns (he, she, it, they, him, their, etc.) refer to when the lecturer uses them.	3.45	5 (2.4%)	16 (7.8%)	66 (32.2%)	118 (57.6%)

3. Creating a text-level representation

Target needs

As Table 8-15 shows, the majority of the participants felt that, when listening to lectures, they 'usually' or 'always' needed to understand the topic's general idea and find links/connections between different ideas. Almost three-quarters said that they 'usually' or 'always' needed to review key points, supporting details and the flow of speech at the end of the lecture to get a complete overview of the topic; remembered most of the information given in a lecture at the end; mentally made links to all the points while listening; quickly recognised similarities and differences between ideas; recognised summaries; imagined the things described.

As opposed to those above, the sub-skills reported as being 'usually' or 'always' needed when processing lectures by about one-half of the participants included: understanding large amounts of information provided quickly, understanding a lecture structured in an unfamiliar way, and understanding a lecture with no clear organisational style.

Table 8-15: Creating a text-level representation, Column/A

Item no. (questionnaire)	Item	Mean	Frequency (percentage)			
			Do not need to be able to (1)	Rarely need to be able to (2)	Usually Need to be able to (3)	Always need be able to (4)
46	Understand the general idea of a topic	3.59	1 (.5%)	10 (4.9%)	61 (29.8%)	133 (64.9%)
35	Find links and connections between different ideas	3.31	1 (.5%0	14 (6.8%)	110 (53.7%)	80 (39.0%)
61	Review key points, supporting details and the flow of speech at the end of the lecture in order to get a complete overview of the topic	3.25	5 (2.4%)	32 (15.6%)	74 (36.1%)	94 (45.9%)
66	Remember most of the information given in a lecture at the end of the class	3.17	7 (3.4%)	32 (15.6%)	85 (41.5%)	81 (39.5%)
37	Make links mentally to all the points made by the lecturer while listening	3.16	3 (1.5%)	36 (17.6%)	92 (44.9%)	74 (36.1%)
54	Quickly recognize similarities and differences between ideas presented during the lecture	3.12	2 (1.0%)	39 (19.0%)	96 (46.8%)	68 (33.2%)
58	Recognize when a lecturer is summarising	3.03	13 (6.3%)	41 (20.0%)	77 (37.6%)	74 (36.1%)
34	Imagine the things described by the lecturer	3.01	5 (2.4%)	47 (22.9%)	93 (45.4%)	60 (29.3%)
64	Understand large amounts of information given out very quickly by the lecturer	2.71	18 (8.8%)	67 (32.7%)	77 (37.6%)	43 (21.0%)
62	Understand a lecture that it is structured in a way that I am not familiar with	2.53	28 (13.7%)	73 (35.6%)	71 (34.6%)	33 (16.1%)
63	Understand a lecture that has no clear organizational style	2.36	42 (20.5%)	74 (36.1%)	63 (30.7%)	26 (12.7%)

Present needs

It can be seen in Table 8-16 that almost one-third of the participants 'usually' or 'always' struggled with understanding a lecture with no clear organisation, large amounts of information provided quickly, and a structure unfamiliar to the listener. Almost one-half said that mentally making links to all the points could 'seldom' or 'sometimes' be engaged in successfully while listening.

When compared to other text-level sub-skills, slightly less than half of the participants felt that reviewing key points, supporting details and the flow of speech at the end, and quickly recognising similarities and differences between ideas were sub-skills that could be 'rarely' or 'sometimes' activated successfully. A little more than one-third said they remembered most of the information at the end of a lecture. However, less than one-third thought that finding links/connections between different ideas, understanding the general idea, recognising when a lecturer was summarising, and imagining things described are the hurdles they must overcome during lecture-listening.

Table 8-16: Creating a text-level representation, Column/B

Item no. (questionnaire)	Item	Mean	Frequency (percentage)			
			Can seldom /rarely (1)	Can sometimes (2)	Can usually (3)	Can always (4)
63	Understand a lecture that has no clear organizational style	2.01	63 (30.7%)	86 (42.0%)	46 (22.4%)	10 (4.9%)
64	Understand large amounts of information given out very quickly by the lecturer	2.17	38 (18.5%)	105 (51.2%)	52 (25.4%)	10 (4.9%)
62	Understand a lecture that it is structured in a way that I am not familiar with	2.30	32 (15.6%)	94 (45.9%)	65 (31.7%)	14 (6.8%)
37	Make links mentally to all the points made by the lecturer while listening	2.54	17 (8.3%)	88 (42.9%)	73 (35.6%)	27 (13.2%)
61	Review key points, supporting details and the flow of speech at the end of the lecture in order to get a complete overview of the topic	2.59	25 (12.2%)	73 (35.6%)	68 (33.2%)	39 (19.0%)
54	Quickly recognize similarities and differences between ideas presented during the lecture	2.72	12 (5.9%)	71 (34.6%)	84 (41.0%)	38 (18.5%)
66	Remember most of the information given in a lecture at the end of the class	2.76	9 (4.4%)	72 (35.1%)	84 (41.0%)	40 (19.5%)
35	Find links and connections between different ideas	2.82	14 (6.8%)	56 (27.3%)	87 (42.4%)	48 (23.4%)
46	Understand the general idea of a topic	3.20	4 (2.0%)	34 (16.6%)	84 (41.0%)	83 (40.5%)
58	Recognize when a lecturer is summarising	3.29	6 (2.9%)	36 (17.6%)	56 (27.3%)	107 (52.2%)
34	Imagine the things described by the lecturer	3.33	6 (2.9%)	30 (14.6%)	59 (28.8%)	110 (53.7%)

4. Creating an intertextual representation

Target needs

In Table 8-17, more than three-quarters of the participants felt that they 'always' or 'usually' needed to use ideas heard in class in other activities, such as assignments, exams and taking notes; combined listening to content with information from a PowerPoint presentation, textbooks or a whiteboard during a lecture; used information from previous lessons to understand a current lecture; and recalled previously understood information to use in exercises and examples during the same lecture. Slightly less than three-quarters said that the following sub-skills were 'usually' or 'always' needed to engage in lectures successfully: combine information heard in a lecture with textbooks or other materials to extend topic knowledge after the lecture and participate well in class by answering questions posed by the lecturer.

Slightly more than half of the participants felt that they 'usually' or 'always' needed to connect the lecture content with pre-lecture reading during lectures, engaged in extra reading to understand the lecture better, understood lectures containing a lot of discussion, and understood the theoretical information presented by the lecturer but which had not yet been used in practice. Overall, these seem to have been needed less when compared to the other sub-skills included here.

Table 8-17: Creating an intertextual representation, Column/A

Item no. (questionnaire)	Item	Mean	Frequency (percentage)			
			Do not need to be able to (1)	Rarely need to be able to (2)	Usually Need to be able to (3)	Always need be able to (4)
81	Use ideas I heard in lectures in assignments, exams and presentations	3.40	1 (.5%)	21 (10.2%)	77 (37.6%)	106 (51.7%)
76	Use effective note taking	3.34	7 (3.4%)	26 (12.7%)	63 (30.7%)	109 (53.2%)
78	Combine listening to lecture content with information I read in PowerPoint, textbooks or on the whiteboard during the lecture	3.30	3 (1.5%)	24 (11.7%)	87 (42.4%)	91 (44.4%)
75	Use information from previous lessons to make it easier to understand the current lecture	3.27	-	38 (18.5%)	73 (35.6%)	94 (45.9%)
65	Recall what I have understood to use in exercises and examples during the lecture	3.12	6 (2.9%)	33 (16.1%)	97 (47.3%)	69 (33.7%)
82	Combine information I have heard in a lecture with textbooks or other materials to extend my knowledge of the topic after the lecture	3.06	7 (3.4%)	45 (22.0%)	82 (40.0%)	71 (34.6%)
80	Participate well in class by answering questions posed by the lecturer	3.03	8 (3.9%)	47 (22.9%)	80 (39.0%)	70 (34.1%)
72	Connect the lecture content with pre-lecture reading tasks during lectures	2.86	8 (3.9%)	64 (31.2%)	81 (39.5%)	52 (25.4%)
85	Conduct extra readings to understand what I hear in the lecture better	2.84	17 (8.3%)	55 (26.8%)	77 (37.6%)	56 (27.3%)
60	Understand lectures when there is much discussion and many responses from students in the class	2.66	23 (11.2%)	69 (33.7%)	67 (32.7%)	46 (22.4%)
83	Understand theoretical information presented by the lecturer but which I haven't used yet in practice e.g. assignments and exercises.	2.61	20 (9.8%)	60 (32.2%)	92 (44.9%)	27 (13.2%)

Present needs

Almost two-thirds of the participants felt that it was not easy to process theoretical information that had not yet been applied. Slightly more than half of the participants found the following problematic: extra reading to support their listening and connecting pre-reading to the lecture. Nearly half of the participants felt they 'rarely' or 'sometimes' successfully engaged in the following to better understand their lectures: combining information heard with other materials after listening, class participation, and understanding discussions.

Only one-third stated that they could 'seldom' or 'sometimes' successfully recall information heard in the same lecture to complete hands-on exercises and examples given during the lecture; and more than one-third felt that using information from previous lessons and note-taking were difficult sub-skills that they 'seldom' or

'sometimes' did successfully. Finally, less than one-third stated that combining listening to a lecture's content with information obtained from a PowerPoint presentation, textbooks or a whiteboard, and using ideas from lectures in assignments, exams and presentations were difficult for them.

Table 8-18: Creating an intertextual representation, Column/B

Item no. (questionnaire)	Item	Mean	Frequency (percentage)			
			Can seldom /rarely (1)	Can sometimes (2)	Can usually (3)	Can always (4)
83	Understand theoretical information presented by the lecturer but which I haven t used yet in practice (e.g. assignments and exercises)	2.20	43 (21.0%)	96 (46.8%)	48 (23.4%)	18 (8.8%)
85	Conduct extra readings to understand what I hear in the lecture better	2.34	49 (23.9%)	65 (31.7%)	64 (31.2%)	27 (13.2%)
72	Connect the lecture content with pre-lecture reading tasks during lectures	2.44	35 (17.1%)	71 (34.6%)	72 (35.1%)	27 (13.2%)
82	Combine information I have heard in a lecture with textbooks or other materials to extend my knowledge of the topic after the lecture	2.66	22 (10.7%)	73 (35.6%)	62 (30.2%)	48 (23.4%)
80	Participate well in class by answering questions posed by the lecturer	2.57	29 (14.1%)	70 (34.1%)	67 (32.7%)	39 (19.0%)
60	Understand lectures when there is much discussion and many responses from students in the class	2.72	26 (12.7%)	59 (28.8%)	67 (32.7%)	53 (25.9%)
65	Recall what I have understood to use in exercises and examples during the lecture	2.87	9 (4.4%)	59 (28.8%)	87 (42.4%)	50 (24.4%)
75	Use information from previous lessons to make it easier to understand the current lecture	2.88	8 (3.9%)	65 (31.7%)	75 (36.6%)	57 (27.8%)
76	Use effective note taking	2.91	11 (5.4%)	66 (32.2%)	58 (28.3%)	70 (34.1%)
78	Combine listening to lecture content with information I read in PowerPoint, textbooks or on the whiteboard during the lecture	3.07	6 (2.9%)	46 (22.4%)	81 (39.5%)	72 (35.1%)
81	Use ideas I heard in lectures in assignments, exams and presentations.	3.07	6 (2.9%)	40 (19.5%)	92 (44.9%)	67 (32.7%)

8.3.2.3 Cognitive and metacognitive strategies

Target needs

As seen in Table 8-19, the students also gave their views in relation to cognitive and metacognitive strategies. More than three-quarters said that motivation, avoiding translation, guessing unfamiliar words from the context, relaxation, identifying comprehension problems, checking whether their understanding was accurate or not, continuing to listen despite difficulties, and concentrating for a long period of time are all essential strategies that should 'usually' or 'always' be used while listening in this situation.

More than half of the participants felt that the following strategies might be needed: reading a speaker's body language, redirecting one's attention after a lecturer has provided unimportant or repeated information, predicting lecture content before attending, and relaxing one's concentration when a lecturer is repeating things already processed. However, only one-third said that they 'usually' or 'always' needed to predict vocabulary or transfer grammatical knowledge from L1 to understand L2 grammar.

Table 8-19: Cognitive and metacognitive strategies, Column/A

Item no. (questionnaire)	Item	Mean	Frequency (percentage)			
			Do not need to be able to (1)	Rarely need to be able to (2)	Usually Need to be able to (3)	Always need be able to (4)
67	Have the motivation to listen to and understand my course lectures	3.38	5 (2.4%)	22 (10.7%)	68 (33.2%)	110 (53.7%)
8	Quickly understand what the lecturer is talking about in English without translating into Arabic in my mind	3.31	5 (2.4%)	27 (13.2%)	72 (35.1%)	101 (49.3%)
16	Use the context of speech to guess the meaning of words I do not know	3.30	3 (1.5%)	30 (14.6%)	74 (36.1%)	98 (47.8%)
68	Relax while listening	3.28	6 (2.9%)	32 (15.6%)	66 (32.2%)	101 (49.3%)
70	Recognize that I have problems understanding some ideas in a lecture	3.26	4 (2.0%)	36 (17.6%0	67 (32.7%)	98 (47.8%)
71	Decide whether my understanding of what the lecturer is saying is correct during lectures	3.22	5 (2.4%)	27 (13.2%0	90 (43.9%)	83 (40.5%)
69	Continue to listen when some words or ideas are too difficult to understand	3.20	3 (1.5%)	44 (21.5%)	67 (32.7%)	91 (44.4%)
10	Concentrate for a long time	3.07	7 (3.4%)	40 (19.5%)	89 (43.4%)	69 (33.7%)
77	Use the lecturer's body language to understand what she is talking about	2.92	17 (8.3%)	52 (25.4%)	66 (32.2%)	70 (34.1%)
12	Refocus on the lecture after a lecturer has said something not important or repeated information	2.88	13 (6.3%)	54 (26.3%)	83 (40.55)	55 (26.8%)
73	Predict the content of the lecture and connect it to what I heard	2.76	20 (9.8%)	53 (25.9%)	88 (42.9%)	44 (21.5%)
11	Stop concentrating when I feel that the lecturer is repeating things I have already understood or which are not important	2.58	27 (13.2%)	68 (33.2%)	74 (36.1%)	36 (17.6%)
74	Predict the vocabulary that will be used by the lecturer before the lecture	2.21	62 (30.2%)	68 (33.2%)	45 (22.0%)	30 (14.6%)
33	Transfer grammatical knowledge I already have in Arabic to what the lecturer is talking about in English	2.10	63 (30.7%)	74 (36.1%)	52 (25.4%)	16 (7.8%)

Present needs

In Table 8-20, less than one-third of them stated that they can 'usually' or 'always' predict vocabulary while listening to a lecture. Less than half the participants felt they could transfer their L1 grammatical knowledge, concentrate for a long time, or predict content before attending; therefore, they seemed to have difficulties with these strategies.

More than half of the participants felt that they 'always' or 'usually' redirected their attention, checked the accuracy of their understanding, avoided translation, continued to listen when faced with difficult material, relaxed, paused their concentration when unimportant or repeated information was presented, and motivated themselves to listen. Moreover, using the context to guess new words, recognising comprehension problems, and reading body language to help with understanding were 'usually' or 'always' engaged in by almost three-quarters of the participants.

Table 8-20: Cognitive and metacognitive strategies, Column/B

Item no. (questionnaire)	Item	Mean	Frequency (percentage)			
			Can seldom /rarely (1)	Can sometimes (2)	Can usually (3)	Can always (4)
74	Predict the vocabulary that will be used by the lecturer before the lecture.	1.87	84 (41.0%)	72 (35.1%)	40 (19.5%)	9 (4.4%)
33	Transfer grammatical knowledge I already have in Arabic to what the lecturer is talking about in English	2.35	50 (24.4%)	66 (32.2%)	57 (27.8%)	32 (15.6%)
10	Concentrate for a long time	2.49	20 (9.8%)	87 (42.4%)	76 (37.1%)	22 (10.7%)
73	Predict the content of the lecture and connect it to what I heard	2.50	23 (11.2%)	86 (42.0%)	67 (32.7%)	29 (14.1%)
12	Refocus on the lecture after a lecturer has said something not important or repeated information	2.74	19 (9.3%)	65 (31.7%)	72 (35.1%)	49 (23.9%)
71	Decide whether my understanding of what the lecturer is saying is correct during lectures	2.75	11 (5.4%)	69 (33.7%)	85 (41.5%)	40 (19.5%)
8	Quickly understand what the lecturer is talking about in English without translating into Arabic in my mind	2.79	21 (10.2%)	58 (28.3%)	70 (34.1%)	56 (27.3%)
69	Continue to listen when some words or ideas are too difficult to understand	2.79	20 (9.8%)	58 (28.3%)	72 (35.1%)	55 (26.8%)
68	Relax while listening	2.82	19 (9.3%)	59 (28.8%)	67 (32.7%)	60 (29.3%)
11	Stop concentrating when I feel that the lecturer is repeating things I have already understood or which are not important	2.90	17 (8.3%)	59 (28.8%)	57 (27.8%)	72 (35.1%)
67	Have the motivation to listen to and understand my course lectures	2.93	10 (4.9%)	57 (27.8%)	76 (37.1%)	62 (30.2%)
16	Use the context of speech to guess the meaning of words I do not know	2.99	9 (4.4%)	49 (23.9%)	83 (40.5%)	64 (31.2%)
70	Recognize that I have problems understanding some ideas in a lecture	2.99	15 (7.3%)	43 (21.0%)	76 (37.1%)	71 (34.6%)
77	Use the lecturer's body language to understand what she is talking about	3.06	17 (8.3%)	37 (18.0%)	67 (32.7%)	84 (41.0%)

8.3.3 Factor analysis

This section presents the factor analysis results. One PCA was applied to question set A (Part 2) to determine which major processing sub-skills are target listening needs and another PCA was applied to question set B (Part 2) to determine which major processing sub-skills are present listening needs.

8.3.3.1 Set of questions A (TSA)

This sub-section presents target listening processing sub-skills from the set of questions A. In terms of pre-analysis data checks, a Kaiser-Meyer-Olkin measure showed a mediocre level of sampling adequacy: KMO = .62 (Kaiser, 1974). Bartlett's test of sphericity chi-square (1540 df=6619, p=0) showed that the correlation between the items

was large enough to perform PCA (Field, 2012). Figure 8-6 shows a scree plot of the analysis.

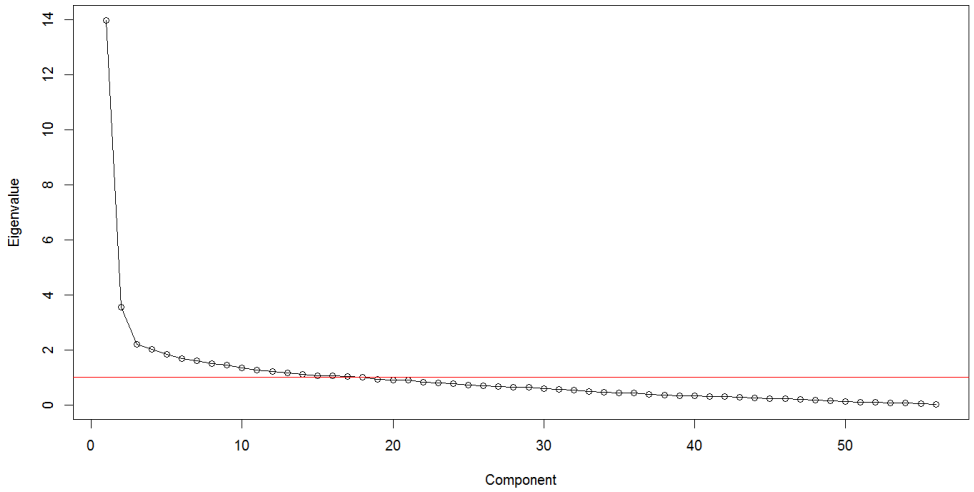


Figure 8-6: Scree plot for set A

The analysis shows that six components were extracted:

1. Organising information
2. Interactiveness
3. Interacting with challenging input
4. Lexical search and input decoding
5. Integrating information and note-taking
6. Acquiring complex knowledge

Table 8-21 shows the major statistics associated with PCA for set A. It can be seen that, overall, six components accounted for 44.0 percent of item variance. The table also presents a Cronbach's alpha analysis for subscales corresponding to each component and it is revealed that components four and five do not meet the reliability criterion of .70 (recommended by Murphy & Davidshofer, 1991). Although analyses involving these two subscales are still reported in the substantive results, it should be kept in mind that the internal consistency of these two subscales is not ideal, and therefore the results for these two subscales should be treated with caution.

Table 8-21: Major statistics associated with PCA, Column/A

	CP1 Organising information	**CP2** Interactiveness	**CP3** Interacting with challenging input	**CP4** Lexical access	**CP5** Integrating information	**CP6** Acquiring complex knowledge
Eigenvalue	6.3	4.69	4.14	3.66	3.46	3.01
Percentage of variance explained	11	8	7	7	6	5
Cronbach's Alpha of subscale	.83	.79	.72	.62	.63	.70
Mean score of need of component	3.33	3.20	2.72	3.00	3.13	2.71

Because an oblique rather than an orthogonal rotation was used, which allows components to correlate, a correlation matrix for the components is displayed. Table 8-22 shows the correlations between components for items in set A, and this justifies the use of Direct Oblimin (oblique) rotation since some of the component correlations exceeded .32, showing that they had more than 10% of their variance in common (Tabachnick & Fidell, 1996).

Table 8-22: Component correlation matrix, Set/A

	PC1	**PC2**	**PC3**	**PC4**	**PC5**	**PC6**
PC1 Organising info						
PC2 Interactiveness	.38					
PC3 Interacting with challenging input	.21	.17				
PC4 Lexical access	.29	.19	.18			
PC5 Integrating/linking information	.34	.28	.14	.19		
PC6 Acquiring complex knowledge	.09	.07	.20	.09	.03	

Below, each component is described individually, accompanied by tables showing the rotated factor loadings. It should be noted that a factor loading cut-off of 0.364 was selected as appropriate to detect an item significantly loading onto a component (Stephens, 2002 as cited in Field, 2012), items above this level are in bold in the tables.

1. Organising information

Table 8-23 shows 14 items loaded onto this component that a listener needs to recognise during a lecture based on students' views on what is needed for lecture comprehension.

The majority of these items seem to be associated with 'creating a text level representation' and 'building a mental model' of higher-level processes.

Table 8-23: Component One, Column/A

Items	PC1	PC2	PC3	PC4	PC5	PC6
Q/46 Understand the general idea of a topic	**.74**	.10	-.11	.05	.04	-.08
Q/49 Differentiate between a lecturer presenting main ideas, adding details or paraphrasing	**.64**	.13	-.04	-.15	.11	.14
Q/53 Realize that not everything said by the lecturer is giving new information	**.63**	-.17	.05	.04	-.03	.12
Q/50 Identify when the lecturer is moving from one point to another	**.60**	-.06	-.13	.16	.16	.16
Q/45 Identify the topic of the lecture	**.57**	.25	-.13	-.12	.09	.08
Q/54 Quickly recognize similarities and differences between ideas presented during the lecture	**.52**	.09	.06	-.15	.27	.19
Q/47 Understand key points	**.50**	.30	.06	-.05	-.05	-.18
Q/56 Understand the lecturers' examples to get the general idea (gist) of something	**.49**	.02	.19	.29	.04	-.04
Q/55 Identify who or what pronouns (e.g. he, she, it, they, him, their etc.) refer to when the lecturer uses them	**.49**	.13	-.07	.33	-.04	-.11
Q/48 Understand details that support key points	**.47**	.27	.24	.01	-.19	-.05
Q/52 Recognize new information	**.47**	.06	.11	.25	.11	-.23
Q/10 Concentrate for a long time	**.47**	-.19	.24	.22	-.01	-.16
Q/35 Find links and connections between different ideas	**.46**	.05	-.24	-.05	**.40**	.03
Q/79 Understand what the lecturer is talking about if key words and ideas are not presented on lecture slides or the whiteboard	**.44**	-.07	.23	-.06	.21	.03

Based on this component, listeners should be able to know the topic (Q/45), the gist/general idea (Q/46), key points (Q/47), details (Q/48), discourse markers (Q/50), illustrative examples (usually illustrating key points or details) (Q/56) and differences between how main ideas are presented and how details are added or paraphrased (Q/49). Additionally, a lecture may contain some dense information; therefore, listeners must connect arguments by quickly identifying similarities and differences (Q/54), finding links between ideas (Q/35) and determining pronouns referring to antecedents mentioned in previous statements (Q/55). Recognising these pieces of information can greatly assist with establishing a coherent, organised representation of the lecture (Field, 2013; Khalifa & Weir, 2009; Zwaan & Rapp, 2006; Carroll, 2008). Also loaded onto this component is segmenting information into new information (Q/52) that the speaker

assumes listeners have not encountered before and old information that might have been delivered in previous lectures, or even repeated from earlier in the same lecture (Q/53). Integrating new and old is generally linked to Clark and Haviland's (1977) 'given-new strategy', wherein listeners must segment information into new and old points while processing a text, in order to achieve coherence. This could further support the relevance of these two items to this component.

Considering this array of sub-processes involved in constructing an organised text representation, as shown in the above paragraph, it becomes evident that a listener is required to concentrate for an extended period (Q/10) while engaging in handling input and organising it. Rost (2011) wrote that attention (or 'concentration' as it is worded in the questionnaire) requires activating specific areas of the brain, based on decisions made by the individual to attend to specific aspects of the input. Attention, as defined by Rost (2011), involves 'the focusing of consciousness on an object or train of thought, which activates the cortex that are equipped to process it' (p.19). Relating attention to create an organised text-level representation as loaded onto this component seems plausible, particularly considering that Aryadoust et al. (2012) found that 'LS [lecture structure] is likely to exert a significant impact on memory and concentration (MC) … and implies that certain lecture structures might be less successful in maintaining the full attention of students' (p.248).

Further, visual information may exist in the form of PowerPoint slides, textbooks or information written on a board to support spoken input (Field, 2011). Understanding what a lecturer is saying if key words and ideas are not presented on slides or whiteboards (Q/79) was also loaded onto the aforementioned items. This item could be linked to this component, in that such visual cues might have an important function in assisting listeners to recognise and organise main and subsidiary points. However, visual aids are not always readily available in real-world lectures; therefore, a listener must attempt to comprehend a lecture even when these visual cues are absent, and this should not have an adverse impact on creating an organised text representation in memory.

2. Interactiveness

Table 8-24 shows 11 items loaded onto this component, most of which require cognitive effort either before or after a lecture. These items are further divided, as they seem to tap into three general cognitive abilities: prior content knowledge, L2 listening strategies and working memory. Bachman and Palmer (1996) group individual listeners' characteristics – namely, topical knowledge, strategic competence and affective schemata – under the heading of 'interactiveness' of TLU tasks. Interactiveness is defined as 'the type of involvement' (Bachman & Palmer, 1996, p.25) generated by interaction that occurs between input and the language user's individual characteristics for the accomplishment of a given TLU task, which in this case is understanding a lecture.

Table 8-24: Component Two, Column/A

Items	PC1	PC2	PC3	PC4	PC5	PC6
Q/81 Use ideas I heard in lectures in assignments, exams and presentations	-.26	**.65**	.09	.01	.22	.14
Q/75 Use information from previous lessons to make it easier to understand the current lecture	.08	**.60**	.03	-.02	.27	-.11
Q/71 Decide whether my understanding of what the lecturer is saying is correct during lectures	.21	**.58**	.04	-.05	-.05	.01
Q/78 Combine listening to lecture content with information I read in PowerPoint, textbooks or on the whiteboard during the lecture	.09	**.48**	-.11	.11	.03	.31
Q/68 Relax while listening	.13	**.48**	-.13	.31	.13	-.21
Q/73 Predict the content of the lecture and connect it to what I heard	.14	**.47**	.19	.11	-.04	.15
Q/72 Connect the lecture content with pre-lecture reading tasks during lectures	.23	**.44**	.04	.05	-.03	.19
Q/67 Have the motivation to listen to and understand my course lectures	.28	**.43**	.12	.07	.14	-.27
Q/61 Review key points, supporting details and the flow of speech at the end of the lecture in order to get a complete overview of the topic	.23	**.42**	.04	.02	.04	.12
Q/70 Recognize that I have problems understanding some ideas in a lecture	.06	**.37**	.24	.27	.03	-.35
Q/66 Remember most of the information given in a lecture at the end of the class	.09	**.36**	.25	.03	.27	0

First, topical knowledge, relates to items that can contribute to activating existing information (prior content knowledge) when attempting to process new information.

This involves using subject-specific knowledge already encountered in previous lesson(s) (Q/75) and doing pre-reading (Q/72) to connect previously learned knowledge and material to new information being delivered. Under this category of topical knowledge, listeners are also required to utilise sub-skills after lectures, namely, using concepts heard in lectures in assignments, examinations and presentations (Q/81). Success in using such sub-skills may largely depend on the quality of lecture preparation and the student's use of previous subject-specific knowledge reflected in items (Q/75) and (Q/72), which could form a solid foundation for obtaining new knowledge. Items (Q/75) and (Q/72) may make it easier for a listener to improve their performance or apply newly acquired knowledge according to other measures of comprehension by using heard knowledge (new knowledge dependent on previous knowledge) learned in class in, for example, assignments. Items (Q/75), (Q/72) and (Q/81) can be linked to creating an intertextual representation process, which requires making links between different sources (oral and written texts).

Second, this component contains five items that are largely related to listening comprehension strategies (Goh, 2002). These are: predicting the content of a new lecture and linking what is heard to expectations formed before the lecture (Q/73), deciding whether the listener's understanding of the content is correct (Q/71) and recognising problems with understanding certain ideas in a lecture (Q/70). Items (Q/71) and (Q/70) are associated with using comprehension monitoring, which may also, to some extent, require the checking of interpretations against predictions or prior content knowledge. This category also includes motivation (Q/67) and physical relaxation (Q/68) that might help a listener to focus on listening (pre-listening preparation strategy).

Third, items associated with post-lecture sub-skills are loaded onto this component, which may be a test of the listener's WM, another listener characteristic. Greater WM capacity correlates with better comprehension (e.g. Bloomfield et al., 2011); therefore, only comprehended information will be remembered and stored in WM efficiently (Q/66), as Carroll (2008) indicates. This can then be recalled to review key points, supporting details and the flow of speech at the end of a lecture to get a full overview of the topic (Q/61).

Finally, and potentially related to WM, content visuals, in the form of an outline of the lecture on slides, information written in textbooks or keywords on the board (Q/78),

may ensure better recall of information post-listening (Duker, 1964 as cited in Bejar et al., 2000). These can also enhance the interest and motivation of the listener while processing a text (Parry & Meredith, 1984) if consistent with the spoken input and if the learner has high language proficiency (Thompson, 1995). Bachman and Palmer (1996) further mention that 'a test [TLU] task that requires the processing of non-verbal visual input … might be quite interactive' (p.29). Therefore, it seems justifiable to include this item, which is a characteristic of text materials, within this component to reflect its connection to the notion of interactiveness to accomplish understanding a lecture.

3. Interacting with challenging input

Table 8-25 shows five challenging issues regarding the nature of spoken input in lectures in terms of overall discourse (lecture structure and information density) or complexity at a propositional level (difficult words or ideas, or lack of clarity) to be loaded onto this component based on students' views about what needs to be activated while listening in this TLU situation.

Table 8-25: Component Three, Column/A

Items	PC1	PC2	**PC3**	PC4	PC5	PC6
Q/63 Understand a lecture that has no clear organizational style	-.10	.04	**.83**	-.04	-.09	.09
Q/62 Understand a lecture that it is structured in a way that I am not familiar with	-.03	-.01	**.80**	.05	-.01	.12
Q/64 Understand large amounts of information given out very quickly by the lecturer	-.02	-.02	**.74**	-.05	.15	-.12
Q/69 Continue to listen when some words or ideas are too difficult to understand	.2	.13	**.52**	-.01	.06	**-.36**
Q/38 Guess what the lecturer is talking about if the information is not entirely clear to me	-.11	.17	**.39**	.19	.16	.02

These input aspects may require a listener to make a considerable effort to follow or understand a lecture. It should be noted that a lecture's style, words or ideas may not be inherently challenging, but may be challenging for a particular listener. Further, this component appears to have relevance to another notion of interactiveness, in particular 'language ability' (Bachman & Palmer, 1996). Bachman and Palmer (1996) argue that responding to a challenge might also involve the listener engaging in a high level of interaction with the input.

According to this component, listeners need to infer the underlying lecture structure and attempt to understand its content and style, even if the structure seems unclear/ not organised to the listener (Q/63). Likewise, a listener has to handle lectures structured in an unfamiliar manner, even when unfamiliarity comes without warning (Q/62). Thus, the inherent vagueness of a lecture and unfamiliarity with a lecturer's style should not necessarily result in a lack of comprehension.

A listener is also expected to process lectures that contain a large amount of information covered quickly (Q/64). Furthermore, listeners ought to continue listening to a lecture even when some of its words or concepts are too difficult to understand (Q/69), and guess unclear information (Q/38).

4. Lexical searching and input decoding

Table 8-26 shows that six items mainly relate to lower-level processes (lexical search and decoding) loaded onto this component.

Table 8-26: Component Four, Column/A

Items	PC1	PC2	PC3	PC4	PC5	PC6
Q/9 Understand my classmates when they talk in English	.01	.18	-.11	**.68**	-.16	.08
Q/15 Understand many high-level words	-.05	-.17	.14	**.65**	.23	-.04
Q/34 Imagine the things described by the lecturer	-.03	.13	-.15	**.48**	.19	-.02
Q/27 Establish what the lecture will be about from the discussion given at the beginning	.07	.23	-.15	**.46**	.05	.19
Q/5 Understand different English accents	.02	.08	.04	**.38**	.07	.20
Q/19 Focus on key words	.27	-.11	.19	**.37**	.11	-.01

Students thought it seems essential to activate decoding sub-skills, namely: understanding other speakers (Q/9); understanding multiple speakers, such as other students and instructors, while discussing ideas at the beginning of lectures (Q/27); and comprehending different accents in English (Q/5). These items are associated with some aspects of the 'speaker variation' notion, as Field (2013) discusses, with particular regard to 'speaker voice' and 'accent' (p.116). Field (2013) argues that L2 listeners need

to be given time to 'normalise' or adjust themselves to other speakers' voices, particularly in the case of unfamiliarity with a certain voice or the presence of multiple speakers (i.e. a dialogue). Field (2013) adds that encountering unfamiliar speech or accents might obstruct lexical access. For this reason, the phonological aspect typically plays an important role when mapping meaning onto words, rather than simply phonologically decoding words (i.e. lexical access). This may account for their relationship to the other items loaded onto this component. Also loaded onto this component is accessing high-level words as part of the lexical search process (Q/15). Additionally, a listener may have to search for keywords (Q/19) (without the lecturer pointing them out) based on their meanings, which is also a function of the lexical search process.

Finally, imagining things described by the lecturer (Q/34) is typically considered a cognitive listening strategy and is referred to as 'imagery' (Vandergrift & Goh, 2012). This item may be associated with Paivio's (1971) 'dual-coding theory' (DCT), which distinguishes between verbal coding (representing and processing written or spoken language) and nonverbal coding (representing and processing visual objects, situations and events, i.e. world knowledge). According to Sadoski (2005), and as the DCT posits, knowledge and word meanings can be accomplished by verbal and nonverbal coding. It could also be argued that establishing a mental image is a cognitive processing operation that occurs when accessing a word's meaning (or spelling) while processing a lecture. While concrete words (e.g. tree) might evoke both verbal and nonverbal sensory referents that reside in the listener's memory, abstract concepts (e.g. true) may have less access to mental imagery (Sadoski, 2005).

5. Integrating information and note-taking

Seven items are loaded onto this component (Table 8-27) which can be associated with 'creating a text-level representation' and 'inferencing' processes.

Table 8-27: Component Five, Column/A

Items	PC1	PC2	PC3	PC4	PC5	PC6
Q/30 Connect a piece of information that was spoken earlier by the lecturer to another point given in the same lecture to understand the other point	-.01	.19	-.11	.07	**.71**	-.04
Q/31 Understand unfamiliar ideas	0	-.02	.25	-.04	**.60**	.15
Q/37 Make links mentally to all the points made by the lecturer while listening	.11	.20	.04	.02	**.49**	-.04
Q/20 Recognize that the lecturer is using a synonym of a word I do not know	.23	-.08	-.05	.31	**.47**	.12
Q/76 Use effective note taking	.14	.22	.06	-.1	**.44**	-.09
Q/16 Use the context of speech to guess the meaning of words I do not know	.12	-.04	.12	.30	**.40**	-.30
Q/35 Find links and connections between different ideas	**.46**	.05	-.24	-.05	**.40**	.03

Based on what the students thought is needed, listeners may have to: connect a piece of information the lecturer presented earlier to another point offered in the same lecture for the purpose of understanding the later point (Q/30); make mental links to all other points made (Q/37); find links and connections between different ideas (Q/35). Activating these sub-skills can lead to developing a coherent and complete text representation.

Furthermore, because lectures contain condensed information, it is often useful to take notes (Q/76). Note-taking may help to remind the listener what was said earlier (Q/35), improve the connection between what is currently being heard and what was said earlier (Q/30), and record an unfamiliar word or concept the listener intends to look up after the lecture (Q/16). Indeed, note-taking can help to build connections across all of the input and lead to creating a text-level representation, which might account for the note-taking relationship with other items loaded onto this component.

This component also involves ‘inferencing’, whereby a listener may need to add information to infer unfamiliar concepts (Q/31), e.g. when hearing synonyms to understand unknown words (Q/20) or when using the context of speech to guess words based on cues available in the entire discourse (Q/16).

6. Conceptualising/acquiring complex knowledge by extracting information

Table 8-28 shows seven sub-skills loaded onto this component, and are required of a listener who possesses high-order thinking capacity to achieve understanding and learning during lecture-listening.

Table 8-28: Component Six, Column/A

Items	PC1	PC2	PC3	PC4	PC5	PC6
Q/59 Recognise that key points might be presented in the first half of the lecture	-.04	.19	.08	.28	-.09	**.51**
Q/83 Understand theoretical information presented by the lecturer but which I haven't used yet in practice (e.g. assignments and exercises)	.19	.03	.32	-.22	.18	**.49**
Q/32 Link the literal and metaphorical meanings of ideas	-.01	-.04	.05	.16	.34	**.43**
Q/26 Understand grammatically complex language	.04	-.14	.23	.35	.12	**.43**
Q/60 Understand lectures when there is much discussion and many responses from students in the class	.12	.21	.30	.13	-.12	**.41**
Q/80 Participate well in class by answering questions posed by the lecturer	.14	.21	.16	-.08	.18	**.39**
Q/69 Continue to listen when some words or ideas are too difficult to understand	.2	.13	**.52**	-.01	.06	**-.36**

This component measures, based on students' views, that a listener is generally required to acquire complex theoretical information/concepts that are spoken by the lecturer but which have not yet been used in practice (Q/83). A listener may also need to connect the literal and metaphorical meanings of concepts by looking for a relationship between the two (Q/32). Further, a listener may need to think in order to synthesise information when responding to a lecturer's questions that might be based on what has only been implicitly stated (Q/80), and to combine information generated by different speakers during discussions (Q/60).

Further, this component measures that a listener needs to increase his/her capacity to solve problems quickly while processing a lecture, specifically continuing to listen even when some words or concepts are difficult to assimilate (Q/69) or when words or concepts are presented in complex grammatical structures (Q/26). To overcome these challenges, a listener must guess difficult words, meaning of structures, or concept based on available information. The seventh activity, which relates to a lecturer emphasising key points at the beginning of class, seems out of place within this component (Q/59).

8.3.3.2 Set of questions B (PSA)

This section introduces present listening needs for the set of questions B**.** In terms of pre-analysis data checks, the Kaiser-Meyer-Olkin measure showed a mediocre level of sampling adequacy: KMO= .61. Bartlett's test of sphericity chi-square (2701 df=10411, p=0) showed that the correlation between items was large enough to perform PCA. Figure 8-7 shows a scree plot for the analysis.

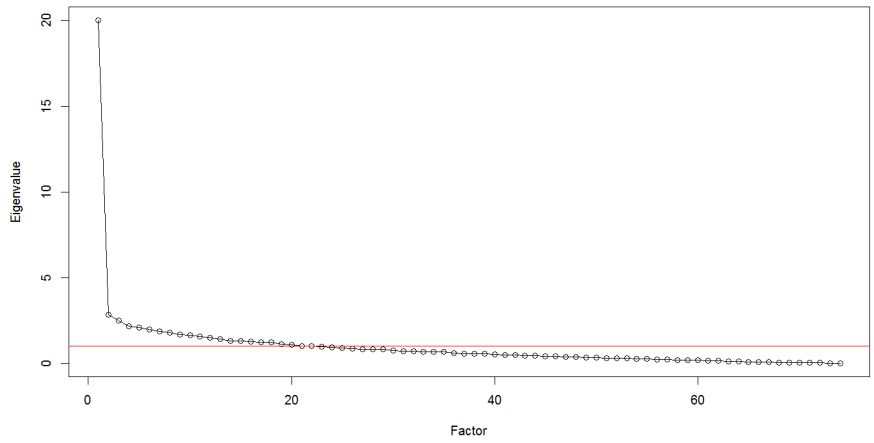


Figure 8-7: Scree plot for set B

Again, the analysis shows that six components emerged:

1. Distinguishing between new and old information
2. Assigning meaning to sounds, words, phrases
3. Extracting essence from a speaker's words or voice
4. Integrating information across texts and inferencing
5. Handling unfamiliar input
6. Understanding explicitly and implicitly stated information

Table 8-29 shows the major statistics associated with PCA for set B. It can be seen that, overall, these six components accounted for 43.0% of item variance. The table also shows Cronbach's alpha for subscales corresponding to each component and reveals that component five marginally fails to meet the criterion of a minimum of .70.

Table 8-29: Major statistics associated with PCA, Column/B

	CP1 Distinguishing between new and old information	**CP2** Assigning meaning to sounds, words, and phrases	**CP3** Extracting essence from the speaker's words or voice	**CP4** Integrating information across texts and inferencing	**CP5** Handling unfamiliarity of input	**CP6** Understanding explicitly and implicitly stated information
Eigenvalue	7.04	6.66	5.63	4.47	3.92	3.83
Percentage of variance explained	10	9	8	6	5	5
Cronbach's Alpha of subscale	0.82	0.84	0.79	0.76	0.69	0.74
Mean score of need of component	3.13	2.67	2.82	2.51	2.38	2.59

Table 8-30: Component correlation matrix item, Column/B

	PC1	**PC2**	**PC3**	**PC4**	**PC65**	**PC6**
PC1 Distinguishing between new and old information						
PC2 Assigning meaning to sounds, words, and phrases	.38					
PC3 Extracting essence from the speaker's words or voice	.38	.33				
PC4 Integrating information across texts and inferencing	.24	.22	.20			
PC5 Handling unfamiliarity of input	.20	.22	.21	.19		
PC6 Understanding explicitly and implicitly stated information	.25	.23	.23	.17	.16	

Below, each component is described individually and is accompanied by tables showing rotated factor loadings.

1. Distinguishing between new and old information

As Table 8-31 shows, ten items are loaded onto this component that listeners have difficulties with when listening in this TLU situation based on students' views on what is thought to be difficult during lecture-listening. Items loaded highly onto this component are as much about new information as they are about old (duplicated) information; therefore, this component largely refers to the difficulty in distinguishing between new and old (already communicated) information.

Table 8-31: Component One, Column/B

Item	PC1	PC2	PC3	PC4	PC5	PC6
Q/b50 Identify when the lecturer is moving from one point to another	**.74**	-.07	.09	-.05	.05	.05
Q/b57 Recognize when a lecturer is giving her personal opinion about an idea in a lecture	**.65**	.18	0	.06	-.27	.05
Q/b51 Recognize comments made by the lecturer that are not relevant to the topic of the lecture	**.63**	-.06	-.04	.06	.01	.17
Q/b55 Identify who or what pronouns (he, she, it, they, him, their…etc.) refer to when the lecturer uses them	**.56**	.22	-.15	-.02	.14	-.05
Q/b53 Realize that not everything said by the lecturer is giving new information	**.53**	.02	.07	.10	.06	.13
Q/b71 Decide whether my understanding of what the lecturer is saying is correct during lectures	**.50**	.05	.17	0	.12	.04
Q/b56 Understand the lecturer's examples to get the general idea (gist) of something	**.48**	.13	.19	-.18	.34	-.35
Q/b52 Recognize new information	**.46**	.16	.17	.10	.13	-.10
Q/b24 Connect words together to make a short, single phrase	**.43**	.15	-.22	.18	-.01	.20
Q/b58 Recognize when a lecturer is summarising	**.43**	.23	.12	.13	-.17	.05

Here, distinguishing new from old may be difficult, as a listener might struggle to distinguish new information (Q/b52) from information previously given, perhaps in the form of redundant information (Q/b53). Also, this might involve struggling with identifying pronouns referring back to old, previously made points (Q/b55), recognising that examples (considered new information) are referring to points already stated (key or subsidiary points) (Q/b56), recognising summaries (containing already given, repeated information) for what they are (Q/b58), recognising when a speaker gives a personal opinion about an already elucidated point rather than presenting it as a new point (Q/b57), and recognising irrelevant comments made by lecturers, rather than considering them as new and relevant ideas added to the lecturer's topic (Q/b51). Further, a listener might have difficulty with identifying discourse markers when a speaker is moving from one point to another (this could be from a new to an old point or vice versa) (Q/b50). Finally, the provision of old information in addition to new points might give the listener an opportunity to decide, during a lecture, whether their understanding of what the lecturer is saying is correct (Q/b71). The item requiring connecting words together to make a short, single phrase (Q/b24), intended to refer to the process of establishing a propositional meaning at a local level, is unclear; however, how this item is associated with the other items in this component.

2. Assigning meaning to sounds, words, phrases

In Table 8-32, 13 items were loaded onto this component and they largely focus on lower-level processes: input decoding, lexical search and syntactic parsing.

Table 8-32: Component Two, Column/B

Items	PC1	PC2	PC3	PC4	PC5	PC6
Q/b2 Recognize all the words I know that are spoken by the lecturer	.14	**.61**	.02	-.24	.07	.11
Q/b3 Notice the lecturers' pronunciation of new words	.14	**.59**	.02	.10	-.05	-.13
Q/b14 Understand the meaning of many words in English	-.07	**.57**	-.03	.20	.11	-.04
Q/b15 Understand many high-level words	.06	**.56**	-.05	.11	.07	.18
Q/b5 Understand different English accents	.01	**.54**	.03	.08	.14	.04
Q/b26 Understand grammatically complex language	-.13	**.51**	.10	.21	.18	.09
Q/b4 Understand lecturers who speak (too) fast	.05	**.51**	0	-.05	.04	.24
Q/b8 Quickly understand what the lecturer is talking about in English without translating into Arabic in my mind	.14	**.50**	.13	.04	.02	-.02
Q/b16 Use the context of speech to guess the meaning of words I do not know	.17	**.48**	-.04	-.02	-.18	.25
Q/b21 Recognize the names of poets, characters, researchers, places, titles of novels, plays and poems	.10	**.43**	.26	-.02	.02	-.14
Q/b69 Continue to listen when some words or ideas are too difficult to understand	-.09	**.42**	.13	.05	.28	.01
Q/b1 Notice words as connected ideas	.28	**.42**	-.03	-.25	.01	.34
Q/b32 Link the literal and metaphorical meanings of ideas	-.06	**.37**	.18	.02	.25	.35

Based on this component, while decoding, a listener might struggle with: listening to larger chunks of words and listen on a word-by-word basis instead (Q/b1); recognising familiar words by sound only (Q/b2); identifying new words' pronunciation in connected speech (Q/b3), as well as decoding words' meanings when uttered quickly (Q/b4) or in different accents (Q/b5). Secondly, during lexical access, a listener might find it difficult to: access many words from their lexicon (Q/b14), including high-level words (Q/b15); understand what English proper nouns mean and if a word refers to the name of a character, a town, a play or a story (Q/b21); understand words/ideas that denote a non-literal meaning (having both literal and metaphorical meaning) (Q/b32). Further, in the case of failure to access such words automatically, a listener might also struggle with using contextual cues to guess appropriate meaning (Q/b16) and then find

it difficult to continue listening when encountering a word or an idea that does not exist in their lexicon (Q/b69). Further, listeners might mentally translate speech heard in L2 into their L1 rather than immediately processing it in English (Q/b8). Finally, during syntactic processing, a listener might struggle with constructing a surface structure of utterances, especially if they are grammatically complex, to obtain a literal interpretation of an idea (Q/b26).

3. Extracting the essence of a speaker's words or voice

Onto this component, 11 items were loaded, as table 8-33 shows, pertaining to the listener's difficulty in extracting the essential meaning of words themselves or from the speaker's voice.

Table 8-33: Component Three, Column/B

Items	PC1	PC2	PC3	PC4	PC5	PC6
Q/b39 Identify cues given in lectures to indicate something important	.07	-.21	**.62**	-.11	.02	.33
Q/b19 Focus on key words	-.09	.08	**.59**	.34	.11	-.1
Q/b46 Understand key points	.09	.09	**.54**	.09	.12	.09
Q/b18 Understand the definitions of technical terms	-.1	.21	**.49**	-.21	.11	.15
Q/b47 Understand the general idea of a topic	.31	.10	**.48**	.03	-.04	-.06
Q/b17 Recognize technical terms	-.17	.31	**.44**	-.28	.10	.29
Q/b45 Identify the topic of the lecture	.31	.04	**.44**	.05	-.09	.05
Q/b42 Make judgements about what is important and not important when the lecturer is speaking	.02	.18	**.42**	.31	-.20	.18
Q/b7 Distinguish between phonological features e.g. stress, intonation, tone in phonology and phonetics classes	.14	.30	**.40**	-.02	-.03	-.14
Q/b59 Recognize that key points might be presented in the first half of the lecture	.13	-.02	**.38**	.10	.22	.01
Q/b6 Understand why lecturers emphasize some words or phrases when they talk generally	.12	.32	**.36**	.16	-.27	-.03

First, based on what students thought, listeners might be unable to easily extract meaning based on explicit or implicit information offered in a lecture, such as keywords that carry important meaning about: an individual proposition or the lecture as a whole (Q/b19); technical terminology (Q/b17); the definitions of technical terms (Q/b18); important, key points (Q/b46); the title/topic of the lecture (Q/b45); a general idea of the

entire lecture (Q/b47); distinguishing between important and unimportant information by making judgements about the words said (Q/b42). Second, the component measures the difficulty of extracting information from a speaker's implicit or explicit emphases when a speaker emphasises important ideas at the beginning of a lecture to draw listeners' attention to them (Q/b59). It also measures the listener's difficulty with: extracting prosodic information from the speaker's voice when a lecturer emphasises a word or a phrase (Q/b6); extracting 'cues' that a lecturer may give to emphasise an important point (Q/b39); identifying prosodic features (e.g. intonation, stress) as they are taught in classes such as phonology (Q/b7).

4. Integrating information across texts and inferencing

In Table 8-34, ten items were loaded onto this component, these are associated with two processes: creating an intertextual representation and inferencing.

Table 8-34: Component Four, Column/B

Items	PC1	PC2	PC3	PC4	PC5	PC6
Q/b74 Predict the vocabulary that will be used by the lecturer before the lecture	-.10	-.14	.09	**.59**	.25	.15
Q/b85 Conduct extra readings to understand what I hear in the lecture better	0	.07	-.09	**.51**	.12	.19
Q/b81 Use ideas I heard in lectures in assignments, exams and presentations	**.37**	-.12	.01	**.48**	-.05	.04
Q/b41 Understand what a lecturer is saying without using my previous knowledge of the topic	0	.23	.17	**.46**	.10	-.13
Q/b38 Guess what the lecturer is talking about if the information is not entirely clear to me	.19	.12	-.04	**.44**	-.08	.17
Q/b35 Find links and connections between different ideas	.05	.17	.08	**.42**	0	.14
Q/b83 Understand theoretical information presented by the lecturer but which I haven t used yet in practice (e.g. assignments and exercises)	-.05	.17	-.11	**.42**	**.42**	-.02
Q/b78 Combine information I have heard in a lecture with textbooks or other materials to extend my knowledge of the topic after the lecture	.05	0	.15	**.41**	.07	.11
Q/b40 Predict answers to lecturers' questions	.24	.21	-.10	**.41**	.07	.10
Q/b20 Recognize that the lecturer is using a synonym of a word I do not know	.01	.33	.33	**.37**	-.24	-.09

This component measured the students' difficulty with doing extra reading to help process lectures (Q/b85), predicting vocabulary that might be uttered in input (Q/b74), combining information heard in lectures with textbooks and other materials to extend topical knowledge (the lecture is the point of departure for this) (Q/b78), using content

heard in lectures in new situations (e.g. exams) (Q/b81) and acquiring a good understanding of theoretical knowledge even if not complemented in a practical way involving the application of theoretical knowledge in examples, hand-on exercises and assignments (Q/b83). These five items might lead to producing 'an integrated representation of multiple texts' to achieve a better understanding (Stromos & Braten, 2002). Such an integration process typically requires making links between ideas (Q/b35) (perhaps as found between different texts, not just a single text) to facilitate this process; such links might be implicit and also require inferencing, which might be difficult for listeners here. Further, this component measured listeners' difficulty based on three items that necessitate going beyond explicitly stated information and adding external knowledge, i.e. inferencing as both a process or a strategy. Listeners might struggle with making 'text-based inferences', which involves inferencing as a process used on parts of the message (Khalifa & Weir, 2009), based on their ability to predict answers to the lecturer's questions (Q/b40) or guessing about unclear information by inferring information heard in the same text or based on an integrated text representation formed via different texts (Q/b38). Based on this component, the listener's difficulty with inferencing as a strategy occurs when guessing an unfamiliar word's meaning from a synonym (Q/b20). Lastly, for the item of understanding a text based on its linguistic units without relying on world knowledge (intended as an overelaboration ineffective cognitive strategy) (Q/b41), it is unclear how this item is associated with the other items in this component.

5. Handling unfamiliar input

As shown in Table 8-35, five items were loaded onto this component. These all appear to measure the listener's difficulty with handling unfamiliar material in lectures.

Table 8-35: Component Five, Column/B

Items	PC1	PC2	PC3	PC4	PC5	PC6
Q/b62 Understand a lecture that it is structured in a way that I am not familiar with	.07	.19	.06	.13	**.56**	.01
Q/b64 Understand large amounts of information given out very quickly by the lecturer	-.03	.11	.05	-.06	**.49**	.26
Q/b83 Understand theoretical information presented by the lecturer but which I haven t used yet in practice (e.g. assignments and exercises)	-.05	.17	-.11	**.42**	**.42**	-.02
Q/b44 Completely understand each idea the lecturer is talking about	.29	.12	.22	-.08	**.41**	-.01
Q/b65 Recall what I have understood to use in exercises and examples during the lecture	.28	-.06	.31	-.09	**.38**	-.14

Based on the students' views, a listener may not: easily understand large amounts of information disseminated very quickly (Q/b64); understand a lecture that is structured in an unfamiliar manner (Q/b62); understand theoretical knowledge without the benefit of practising it via hands-on activities (Q/b83); completely comprehending each point presented (Q/b44); recall new information that may also be unfamiliar to the listener to be applied in exercises immediately after hearing the information (Q/b65).

6. Understanding explicitly and implicitly stated information

Four items loaded onto this component; these sub-processes seem to represent specific comprehension aspects relevant to van Dijk and Kintsch's (1983) construction-integration theory (Table 8-36).

Table 8-36: Component Six, Column/B

Items	PC1	PC2	PC3	PC4	PC5	PC6
Q/b36 Work out information that is not explicitly spoken by the lecturer	-.02	.06	.09	.08	.02	**.70**
Q/b37 Make links mentally to all the points made by the lecturer while listening	.16	.08	.03	.11	.18	**.53**
Q/b54 Quickly recognize similarities and differences between ideas presented during the lecture	.23	.18	.06	.08	.16	**.45**
Q/b75 Use information from previous lessons to make it easier to understand the current lecture	.36	0	.10	.21	.03	**.42**

The first two items – making links mentally to all the lecturer's points while listening (Q/b37) and quickly recognising similarities and differences between ideas (Q/b54) – measure the listener's difficulty with identifying information explicitly stated in the

whole lecture. These two sub-processes, involving a network of all or most of the propositions presented in a lecture, need to be integrated at the macro-structure level (i.e. text-based understanding, van Dijk & Kintsch, 1983). The component also measures students' difficulty with using information from previous lessons, which might facilitate understanding of the current lecture (Q/b75) (content knowledge). This sub-process seems to concentrate on the ability to demonstrate a situational model of understanding a text in which prior knowledge (content knowledge) from long-term memory is integrated at the text-based understanding level (understanding all explicit information in a text) to achieve a deeper understanding, based on van Dijk and Kintsch's construction-integration theory, a sub-process that might be difficult for listeners in this situation. Finally, listeners may struggle with working out information that is not explicitly spoken (Q/b36), but which also may help create a situational model understanding as a situational model also emphasises inferencing to supplement input and fill in gaps while processing a text to form a coherent whole (Kintsch, 1998).

8.4 Summary

The Phase 5 analyses identified the responses to what the participants wanted in terms of their listening language-learning sub-skills. Those responses generally ranged from feeling satisfied with their lecture-listening level to being unable to determine their satisfaction with their understanding. However, almost all the participants stated their willingness to develop their academic listening by taking an academic listening course. Furthermore, the students' responses to the open-ended question regarding what they would like to improve in a course resulted in 30 wants as sub-skills, but they generally appeared to ascribe more importance to the sub-skills employed by lower-level processes, while fewer focused on the sub-skills associated with higher-level processes. The participants expressed a strong desire to learn more vocabulary (lexical search). The usefulness of integrating listening with speaking was also confirmed. Many participants noted that interactive listening might be essential for developing their lecture-listening ability (input decoding as well as creating an intertextual representation). Additionally, many participants identified listening to accents as an essential want (input decoding). Participants also wanted to develop their ability with regard to variations in speaker characteristics (speech rate and the sandhi variation), which might reduce the perceptual saliency of many spoken input features (input decoding). Finally, the participants

expressed their desire to increase their concentration during listening (directed attention metacognitive strategy) and taking effective notes (creating an intertextual representation).

With respect to target needs, the analysis also suggests that students assigned more importance to the processes of building a mental model and creating a text-level than to other processes or strategies. With the exception of identifying specific information in the message (lexical search), the following target needs were identified as being the most important (based on mean results): understanding the lecture's general idea, resolving pronouns, recognising new information, recognising discourse markers and identifying key points. These were found to be more important than lower-level processes (e.g. understanding complex grammar) or input decoding (dealing with fast speech). On the other hand, the analysis of present needs suggests that participants may be challenged by both lower- and higher-level processes. The following difficulties were identified as being the most challenging (based on means): relating to a difficulty with prediction as a cognitive strategy (predicting vocabulary before listening), dealing with a lecture that has no clear organisational style (creating a text-level representation), understanding high-level words (lexical search), dealing with a large amount of information (creating a text-level representation), dealing with (too) fast speech (input decoding) and inferring implicit information (inferencing). Finally, the PCA analyses resulted in six components for A and six components for B. These processes are somewhat different from the processes found in this study's first strand, though many similarities exist.

Chapter 9 Discussion

9.1 Introduction

This chapter discusses the results of this research along two lines: 1) the nature of listening comprehension in real-world lectures, and 2) sequencing as a beneficial methodological approach in NA research. The findings on listeners' overall cognitive and strategic processing in listening comprehension from Phases 1, 2, 3 and 5 of the study are discussed in Section 9.2. Next, the L2 lecture-listening model is presented (9.3), and the findings are triangulated, especially those from Phase 5, with Phases 1–3 in Section (9.4). The validity and reliability of the NA sequencing approach are discussed (mainly based on Phase 4) (9.5). A conclusion to this chapter is drawn in 9.6.

9.2 Cognitive processes, processing sub-skills and strategies used when comprehending lectures in a specific TLU situation

This study has investigated the processes, sub-skills and strategies that listeners need to utilise to successfully process real-world lectures, as reflected in *RQ1* and its sub-questions. This section discusses the cognitive abilities that ELL students, as lecture listeners, either should or are still unable to employ while listening. These abilities were revealed through lecture analyses (Phase 1) and students' stimulated recalls (Phase 2). Lecturers' and students' thoughts about them were revealed through interviews (Phase 3), and students' thoughts about them were revealed through questionnaires (Phase 5).

9.2.1 Phase 1

Phase 1's findings show that accurate text (lecture) processing occurs at a higher level, involving inferencing, building mental models and creating text-level and intertextual representations. Phase 1 emphasised the importance of higher-level processes and sub-skills during lecture-listening. These comprised referring to information from real-world knowledge to understand literal meanings; recalling information from the same text to understand other points; identifying key points and

supporting details; resolving anaphors; reviewing the flow of ideas in the whole text; integrating information from previous lectures to understand a new lecture; connecting aural input to written input from textbooks, slides or whiteboards; and constructing meaning from fellow students.

This higher-level processing is, however, unlikely to occur without activating lower-level processes (input decoding, lexical search, parsing and propositional meaning). Nonetheless, Phase 1's lecture discourse analyses are not particularly helpful in terms of revealing automatic lower-level processes, which are more visible in subsequent research phases. However, the corpus-based analyses that were part of Phase 1 did show, to some extent, that lecture listeners must engage in rather complex linguistic (lower-level) processing because the real lectures from which listeners had to gather information were probably, linguistically, quite complex for them. Those listeners would need to process lengthy aural texts (ranging from 23.32 to 50.66 minutes in this TLU situation). The lectures were also lexically dense (45% content words in this study's corpus), containing about one-third of content words, and the rest function words. This means that those lectures tended to have more written discourse characteristics (Ure, 1971). This supports the lexical density calculated by Nesi (2001), who examined lectures in a similar context and found both lectures from the English department (41.3%) and comparative literature lectures to be lexically dense (41.3% and 49.2%, respectively). Furthermore, the lectures in the current study contained high-frequency words whose meanings listeners had to know. At the same time, listeners should also comprehend both mid- and low-frequency words and technical terms to engage in a successful lexical search process and truly understand lectures. More specifically, in this study's situation, listeners had to access words up to the 17,000-frequency band of English. They should also process complex syntactic structures, such as non-restrictive relative clauses, particularly when listening to literature-oriented lectures. These clauses might be difficult to process while listening and this in turn could hinder listeners from engaging in successful parsing, as argued by Crawford-Camiciottoli (2007).

The lecturers who delivered lectures in Phase 1 also seemed to anticipate the difficulties that certain listeners in their classes might struggle with, particularly lower-level processes (input decoding and lexical search). Thus, to help their students

understand the content and process lectures effectively, those lecturers generally tended to speak at average or moderately slow rates (126 wpm). This speed is quite similar to the speech rate calculated by Crawford-Camiciottoli (2005) when comparing the same lecture delivered by a guest lecturer in different, L1 and L2, settings. This lecturer spoke at 183 wpm to an audience from the same speech community, but at 125 wpm to an L2 audience. The lecturers in the present study also used considerable linguistic redundancy (synonyms, exact repetitions and paraphrasing), along with (quite sparse) translation and transfer as cognitive strategies to facilitate processing lectures.

9.2.2 Phase 2

Phase 2 revealed that the five less successful listeners (low scorers on the IELTS listening test), regardless of their proficiency level or year of study, had real-time processing problems associated with every lower- and higher-level process identified in the previous phase.

These issues related to the input decoding process. For example, one listener did not decode known words, such as 'personification', 'city' and 'New York', or unknown words, such as 'preacher', when she heard them in connected speech. The other low-scoring listeners did not fluently process words/ phrases in real time and had to listen again to the lecture or at least parts of it. Other listeners demonstrated lexical search problems. For example, they did not know the meanings of words such as 'raisins' or even when synonyms were used, such as 'deferred' for 'postponed' in a poetry lecture. Another listener was unable to link an aural encounter with 'martyr' to its spelling in the accompanying textbook. Weak parsing and establishing propositional meaning were the lower-level process that affected the less successful listeners the most in comparison to other lower- and higher-level processes. All the low- and average-scoring listeners frequently reported, or were observed to have, difficulties with parsing continuous utterances and constructing the meanings of propositions. They picked out words but failed to segment utterances and construct literal meanings at a local text level. This might further explain why the lecturers in Phase 1 spoke at a slightly lower rate, repeated exactly what had been said, provided synonyms and sometimes translated key terms to clarify the meaning of text.

The low-scoring listeners were also challenged by all the higher-level processes. For example, certain listeners did not make inferences to understand a specific part of a text or did not make associations between different pieces of information to construct the main point expressed in a section, based on the literal meaning of the words and phrases heard. They were also unable to recognise some supporting details or discourse markers while listening. Likewise, they struggled to process lectures delivered in an unfamiliar style and to link aural input to written material in slides or textbooks. Importantly, none of the low-scoring or average listeners ended up constructing coherent and accurate text representations of the lectures heard.

While the two successful listeners (high scorers on the listening test) reported no lower-level processing problems, they did experience certain higher-level processing issues. However, the latter did not seem to affect their ability to successfully create a text-level process (as evident from producing coherent summaries of the main ideas of what they heard in a lecture). For example, those high-ability listeners had higher-level problems that did not affect their overall text comprehension. These included drawing parallels between literal utterances and metaphorical meanings at a local level of text, making unclear parts of the input comprehensible, linking different pieces of information to understand the main point expressed at a section level, understanding lectures presented in unfamiliar ways and incorporating discussions from other students. This might be because those listeners focused on the more important points of a text's meaning, but ignoring certain things in the message such as comprehensible input or metaphorical meaning at a local level. Thus, they perhaps decided that it was alright not to focus on those elements while listening; rather, they tried to construct a coherent text representation based on the large pieces of information that they processed.

Thus, activating higher-level processes would probably fail without engaging in successful lower-level processing. This is because listeners need to pay less attention to sounds and words to make space in their working memory for meanings resulting from higher-level processes. Relevant to this issue, Hulstijn confirms that 'fluent […] listening is characterized by automatic processing at the lower levels of word recognition and sentence parsing, leaving attention capacity free to concentrate on the higher levels of information, that is, on semantics and content' (2003, p.419). The

problems revealed in this phase might be as a result of several factors, including poor language proficiency in general, difficulty in hearing texts or, as indicated by Goh (2000), limited processing capacity in working memory and shallow processing while listening.

The low-scoring listeners were also found to use more strategies than their high-scoring counterparts. This might be because the low scorers had to compensate for both their lower- and higher-level inefficient processes. However, while the low-scoring listeners employed more strategies, they appeared to activate more ineffective cognitive strategies, including fixation, mental translation and elaboration. Although elaboration – as used by P3 (see *Quotes/5.35, 5.36* and *5.37*) – is generally considered useful for filling gaps in a person's understanding by using general background knowledge (Goh, 2002), overelaboration can result in certain problems, such as difficulty in recognising details or memorising those given in a lecture while listening, thus resulting in incomplete understanding, as argued by Vandergrift (2003) and as occurred with P3. The low-scoring listeners, when encountering processing problems, were also found to be poorly equipped to use metacognitive strategies (e.g. directed attention and comprehension monitoring).

The high-ability listeners used fewer listening strategies, perhaps because they automatically and effectively engaged in cognitive listening in lower- and higher-level processes. They decoded sounds, recognised words/ phrases, accurately segmented speech and recognised key points, details and gist of lectures. They did not apply ineffective cognitive strategies (i.e. fixation, translation and overelaboration). Only P7 used one metacognitive strategy (directed attention) at a late stage, which affected the strategy's success (*Quote/5.28*).

Thus, although Phase 2 did not investigate listeners' effective use of strategies, the high-ability listeners were not found to have used metacognitive strategies, perhaps due to their successful activation of lower- and higher-level processes that reduced their need for such strategies. Moreover, perhaps the constraints on attentional sources and processes at a lower level prevented them from successfully employing deep processing strategies, such as comprehension monitoring, or engaging in complex higher-level processes, such as creating a text-level representation, as argued by Vandergrift (1997).

Finally, the finding that low-scoring listeners had more problems with lower-level processes confirmed Goh's (2000) result that less successful listeners show more perception problems, such as difficulty in recognising known words, concentrating (either doing so too much or having trouble concentrating in general), parsing (e.g. when constructing mental representations from words heard) and understanding later parts of the input due to earlier issues. One finding of the present study that contradicts Goh's (2000) work is that successful listeners have no problems in common with less successful listeners, except those that might be beyond their control, such as coping with an unfamiliar lecture style. This might be because high-ability listeners in Goh's (2000) study were still learning English for their undergraduate studies, whereas high-ability listeners in the current study were already studying advanced-level English, particularly the student in the final year of her undergraduate programme.

9.2.3 Phase 3

Phase 3 identified several target and present listening needs associated with every lower- and higher-level process identified in this study. In this phase, content lecturers identified more sub-skills and strategies than those found in previous phases; they also identified more of those sub-skills and strategies than the students interviewed. Lecturers said they expected their listeners to activate 41 sub-skills during lecture-listening, while students identified 29 sub-skills they felt were important, most of which were similar to those identified by the lecturers.

In terms of lower-level processing, lecturers expected listeners to process incoming input fluently and in real time; they did not want to have to repeat an utterance because someone did not catch it immediately, discern prosody or listen to other students to engage effectively in input decoding. They also thought listeners should notice proper nouns in English and be familiar with technical terms and other words frequently used in lectures for successful lexical searching. Further, listeners should link what they hear to English syntactic knowledge (particularly to process content delivered in linguistics-oriented lectures). Lecturers felt it was less important to decode rapid speech, notice keywords or understand different accents in English. The students, in contrast, put more emphasis on word pronunciation recognition (input decoding) and noticing keywords while listening (lexical search). Students generally

identified fewer lower-level sub-skills than the lecturers. This might be because those processes are so familiar and automatic for the students that they do not even notice that they engage in them while listening. Further, students seemed to emphasise the importance of noticing and extracting keywords in utterances that carry important meanings for a specific utterance or the lecture as a whole, while lecturers placed more importance on accessing words in general. This might be because these students, as listeners, have difficulties with vocabulary in general and struggle to segment speech into meaningful propositions, making them more likely to rely on keywords to grasp the meaning of a lecture.

The results of Phase 3 also showed the importance of activating complex higher-level processes to accurately understand lectures. This was evident in the frequency with which respondents mentioned high-level sub-skills—more than in Phase 2, in which they largely emphasised lower-level processes. Lecturers said that in order for listeners to successfully make inferences, they needed to be able to efficiently recall what they had processed already (in the same lecture) while processing other relevant pieces of information, without the lecturer pointing out what needed to be recalled. Lecturers also emphasised that listeners should link what they hear to their real-world background knowledge (often part of the content) to understand lectures at a deeper level. Moreover, as part of building a mental model, lecturers want their listeners to be able to judge the quality of information they are hearing rather than attaching equal importance to every snippet in a lecture. Listeners must also distinguish new points from continuing ones, rather than thinking that everything delivered is fresh information; they must differentiate key points and supporting details, and use discourse markers while following a lecture. Furthermore, lecturers thought it was essential that students are able to recognise a lecture's overall structure and find similarities and differences between points in the message. Finally, lecturers confirmed that it is important for listeners to link background reading to the lecture, connect speech to information written in/on textbooks/ slides/ whiteboards, complete assignments, do exams and integrate content from multiple lectures, all of these being essential sub-skills for creating effective intertextual representations. This latter process often helps to build a well-articulated mental model of the subject matter (Stahl et al., 1996). The students, in contrast, only emphasised the need to recognise paraphrasing, follow a lecture's structure, link previous related knowledge and take

notes. Students are probably not aware what types of information in the message need to be focused on, or have no clear idea about the activities that are important for successful listening.

On the one hand, it can be concluded that subject lecturers appeared to know a great deal about what skills their listeners should utilise for successful lecture-listening. On the other, the students themselves did not seem to have a clear idea how to be a good listener in a real-world lecture context. This is similar to what Ferris (1998) found when comparing lecturers' and students' views. Ferris attributed this discrepancy to the fact that while what listening entails is often implicit to students, lecturers are more explicit on this point because they teach target courses. Lecturers in the current study identified even more sub-skills than those in Ferris, perhaps due to different research methods; this study utilised interviews, while Ferris used a written questionnaire.

Phase 3 identified several difficulties students face when listening to lectures. Lecturers felt that certain listeners in their classes suffered from weak input decoding. Problems included difficulty in fluently decoding speech and listening to individual words rather than concatenating utterances to construct overall meaning. Lecturers also said that certain listeners had problems with knowing the meaning of general English words, recognising and knowing English proper nouns rather than treating them as regular words, and the lexical search process. Lecturers also mentioned problems associated with parsing and propositional meaning, particularly difficulty in processing complex syntactic structures. However, all the lecturers thought that the biggest obstacle for certain listeners in this situation was their weak language proficiency in general. This in general indicates problems with every aspect of the lower-level processing stage. In contrast, despite the fact that the students interviewed had average scores on the IELTS listening section, they only emphasised their difficulty in decoding other students' speech. The students did not report any decoding problems during lecture-listening, such as only listening to single words or difficulty in processing rapid speech and accents while listening, nor did they mention any difficulties with accessing word meanings in general. Instead, they felt their main difficulty with the lexical search process lay in understanding technical terms.

Again, the lecturers discerned more high-level listening processing problems than

did their students. They reported that certain listeners seemed to struggle with inferencing due to insufficient world knowledge, preventing them from making 'elaborative inferences' (Imhof, 2010). Certain listeners also struggled with building a mental model. For example, they had difficulty in recognising key points, assessing information and discovering relationships between spoken ideas in lectures. The lecturers, however, did not seem to emphasise listeners' difficulty with creating a text level compared to building a mental model and creating intertextual representations. They did mention students' difficulty in recognising a lecture's structure and discerning similarities and differences in information. But no lecturers mentioned any difficulty with construing a lecture's main idea (which was often implicit), and only one student (S3) mentioned this. This is perhaps because the lecturers focused more on explicit elements in the message, such as key points, details and discourse markers in lectures, and understanding them probably leads to constructing a gist meaning of lectures that is not as explicit as details or key points, and this was perhaps overlooked by the lecturers. Several difficulties with creating intertextual representations were reported in Phase 3, perhaps because lecturers were able to judge this based on unanswered questions in written assessments as well as by asking students if they had done the recommended background reading or remembered old information they had learned in class. These difficulties mainly included problems with using information heard in multiple lectures to complete assignments or pass exams, failing to do the necessary background reading to understand a new lecture, failing to integrate information from multiple lectures and poor note-taking.

The students, in contrast, identified fewer difficulties than their lecturers, and more of those they mentioned were associated with higher-level processes. They most frequently mentioned difficulties with co-discovering relationships between different ideas, making judgements about information, integrating information they heard in multiple lectures, and using knowledge they heard and learned from lectures to successfully complete assignments and sit exams, as well as difficulty in taking notes efficiently. They did not report having difficulty understanding examples, paraphrasing or detecting similarities and differences between ideas in a text. Only one student mentioned that she struggled to recognise a lecture's structure.

While Ferris (1998) found that it was difficult for lecturers in her study to identify

academic listening problems (they only reported problems based on what they saw in exams), this phase of the present study found the opposite. Lecturers were able to identify several difficulties. Sometimes these were based on what they saw while lecturing, including problems with implicit sub-skills such as listening to single words; a lecturer who taught earlier levels in the programme mentioned this problem four times. Sometimes the lecturers also mentioned problems based on issues they could see, e.g. listeners not taking notes, perhaps because they do not know what is important to note down.

Phase 3 of this study also revealed that listeners need to use three metacognitive strategies: directed attention, comprehension monitoring and pre-listening preparation for lecture-listening. The lecturers mentioned these strategies more often than did the students. The lecturers, for example, asserted that listeners should decide to listen carefully and take an interest in a lecture's topic by motivating themselves to listen and ridding themselves of distractions. They also asserted that listeners should direct their attention for long periods of time while they listen, especially when they are dealing with lengthy discourse, and make efforts to maintain their focus. For example, after noting something down they should quickly redirect their attention to the input so that their attention does not waiver. Finally, the lecturers mentioned that listeners should monitor their comprehension by checking their own current understanding of what they are processing against their prior understanding developed from earlier reading (often a prerequisite in a real-world lecture context). As part of comprehension monitoring, listeners must prepare for lectures by reading relevant materials beforehand, identifying words they do not understand, and should ask questions during lectures when they are confused or need clarification. The lecturers also noted that certain listeners use ineffective cognitive strategies, including fixation (e.g. stopping to think about unfamiliar words) and mental translation. They noted the need to use effective cognitive strategies to solve comprehension problems – including inferencing (inferring a word's meaning from the context), prediction (e.g. predicting content based on brainstorming questions asked to stimulate students' thinking before listening) and elaboration.

Regarding metacognitive strategies, only two students talked about using pre-listening preparation and directed attention. One of these students mentioned the need

to use comprehension monitoring. Both students reported using fixation but neither mentioned translation. Another student, at a higher level of study, reported using inferencing (using the speaker's body language), elaboration and prediction while listening. Previous research has found that listeners who use 'bottom-up' strategies, such as fixation, translation or guessing words, as well as extra-linguistic cues to infer meaning, tend to be less successful (e.g. O'Malley et al., 1989; Vandergrift, 1997, 2003). These strategies generally do not work, Vandergrift (1997) argues, because listeners who use them lack space in their WM to make the best use of metacognitive strategies, which are instead replaced by ineffective strategies.

Because students reported fewer target and present listening needs than lecturers suggested were required, it may be concluded that the students had limited metacognitive knowledge of listening-related cognitive processes, sub-skills and strategic processing skills that would otherwise allow them to approach listening in a more systematic way and recognise more target and present listening cognitive needs. Moreover, although lectures may impose great demands on L2 listeners, effective use of strategies such as pre-listening preparation, comprehension monitoring and prediction can be particularly helpful when processing input from lectures. For example, using a prediction strategy, forecasting linguistic content and using brainstorming questions asked by a lecturer before listening, might facilitate understanding and pave the way for a deeper understanding in a real-lecture context. This aligns with Goh (2002) and Vandergrift (2003), both of whom found that skilled listeners use effective cognitive and metacognitive strategies to control the listening process.

Phase 3 also uncovered how students wish to improve their ability to listen to lectures (an aspect often neglected in practice). General differences were found between lecturers' and students' responses. The lecturers, for instance, said that their students were generally unaware of what listening comprehension is, or of its importance to their academic success, because they paid more attention to writing and speaking. The students, however, said they were aware of its importance. The lecturers believed that students would not be interested in taking listening comprehension courses unless someone were to bring the importance of listening to their attention; the students, however, said they would like to improve their listening

skills. The lecturers generally emphasised the importance of higher-level sub-skills to enable effective listening. In particular, they wanted their students to learn how to prioritise information given in lectures, cluster different ideas and take notes. The students did not identify with the sub-skills mentioned by their lecturers, except for note-taking though to a lesser extent. The students appeared to care more about being willing to develop lower-level processes, particularly hearing words accurately. Lecturers and students alike gave vague answers about how best to teach listening. This may be because neither group has much insight into language-teaching methodologies.

9.2.4 Phase 5

The findings from Phase 5 generally show that the students either felt satisfied with their listening ability or did not know whether they were satisfied or not, despite Phases 2 and 3 showing that certain students had listening comprehension difficulties. This concurs with Flowerdew and Miller (1992), who found that Hong Kong students listening to English lectures rated their listening ability quite highly although qualitative analyses found they had listening comprehension problems. Yet this contradicts Graham's (2002, 2006) studies in which listening was considered the most difficult skill to acquire and improve among the four language skills, based on learning French as an L2.

The students indicated three potential elements that they most 'wanted' to develop in a lecture-listening course. A larger vocabulary, regardless of type, was desired above all else. This can be seen as aligning with the ample evidence that vocabulary is an essential component and a good predictor of L2 listening ability (e.g. Andringa et al., 2012).

Second, the students wanted to develop 'interactive listening' (Vandergrift & Goh, 2012) or 'two-way listening' (listening/ speaking) (Lynch, 2009). The benefit of this supports Bahns' (1995) claim that the main goal of listening instruction is to prepare students for real-life social interaction, and thus it is 'imperative that developing listening is seen in combination with developing speaking' (p.537). Lynch (2009) also supports the notion that listening/ speaking is common in real-life situations and

connecting speaking to listening can make listeners alert to what speakers say and help them monitor what they are saying themselves when responding.

Third, the students wanted to develop their understanding and ability to decode different English accents. Flowerdew (1994) argues that unfamiliar accents, whether native or non-native, can cause comprehension difficulties. Flowerdew (1994) adds that L2 learners may have better comprehension when the speaker's accent is the same as the listener's, which Harding (2011) labels 'a shared-L1 intelligibility advantage' (p. 165). Some listeners' desire to listen to different accents does not seem to be associated with their TLU situation, however. I observed that most lecturers share the same accent as their students, with only a few lecturers speaking with other accents (particularly Canadian and Malaysian). For this reason, and according to the shared-L1 advantage, the lecturers' local accents could have given students an advantage in comprehending lectures in this TLU, whereas students might have some intelligibility difficulties due to unfamiliarity when listening to other accents. It could also be that the participants foresaw that they would later be required to listen to other, unfamiliar accents outside the university, or after graduation. Thus, participants may not want to focus purely on EAP as it relates to their current TLU situation. Rather, students seem to have listening needs linked to other TLU situations (e.g. in academia, completing postgraduate studies in an overseas country, or for business) in which they are likely to encounter both different native and L2 accents. Indeed, Harding (2011) confirms that 'there is an increasing need for language tests to grapple with the sociolinguistic reality of English language domains […] learners will encounter and deal with a range of accents, including L2 varieties, and […] this should be reflected in listening test constructs' (p.177). This principle can also be applied to listening courses to enhance language-learning authenticity.

In this TLU situation, students ticked as needed most of the statements on target listening needs in the questionnaire (Column A). This could be as a result of the sub-processes included in the questionnaire having been elicited from analyses of previous research phases. The top-ten target needs (M=3.69 to M=3.41; '3=usually' and '4=always need to be able to') were generally associated with three processes: building a mental model (identifying pronouns, discourse markers, key points, examples, lecture titles), creating a text-level representation (identifying the central

idea) and lexical-search processes (allocating meanings to words). This may be because, when a listener attends a lecture, it is more important to know the meaning of the words that it contains than to impose a hierarchical structure. Listeners who engage in these processes successfully might go on to engage in other higher-level processes, namely, creating an intertextual representation and inferencing. For example, a listener might be able to integrate information from multiple lectures (part of creating an intertextual representation) after successfully recognising the gist of and different points in a single lecture in a hierarchical manner.

Regarding the statements on present listening needs in the questionnaire (Column B), students generally thought they had difficulties with only a small number of them. Only 17 (out of 85) sub-skills and strategies were between M=1.87 and M=2.50 ('1=seldom' and '2=sometimes can do') and these are ones that students struggle with during lecture-listening. Most of these difficulties generally relate to both lower- and higher-level processes and to the characteristics of either a text (understanding a lecture with no clear organisation, high-level words, grammatically complex language) or a speaker (fast speech, need to work out information the speaker leaves implicit), or are due to strategic difficulties, namely, prediction (predicting vocabulary before listening) and directed attention (concentrating for a long time). Notwithstanding that many listening problems were identified in Phase 2 when students listened to real lectures, and even though lecturers identified many listening problems, students generally seemed to overestimate their ability and had limited metacognitive knowledge to help them identify any lecture-listening problems they might have. The students identified only those problems that were beyond the control of the listener (e.g. high-level words, implicit information and laziness with regard to engaging in prior reading to predict meaning) rather than blaming themselves.

As shown in Figure 9-1, PCA analyses resulted in six major target-listening sub-skills: 1) organising information, 2) interactiveness, 3) interacting with challenging input, 4) lexical searching and input decoding, 5) integrating information and note-taking and 6) acquiring complex knowledge. Six other major present listening sub-skills were also extracted: 1) distinguishing between new and old information, 2) assigning meaning to sounds, words, phrases, 3) extracting essence from a speaker's words or voice, 4) integrating information across texts and inferencing, 5) handling

unfamiliar input and 6) understanding explicitly and implicitly stated information.

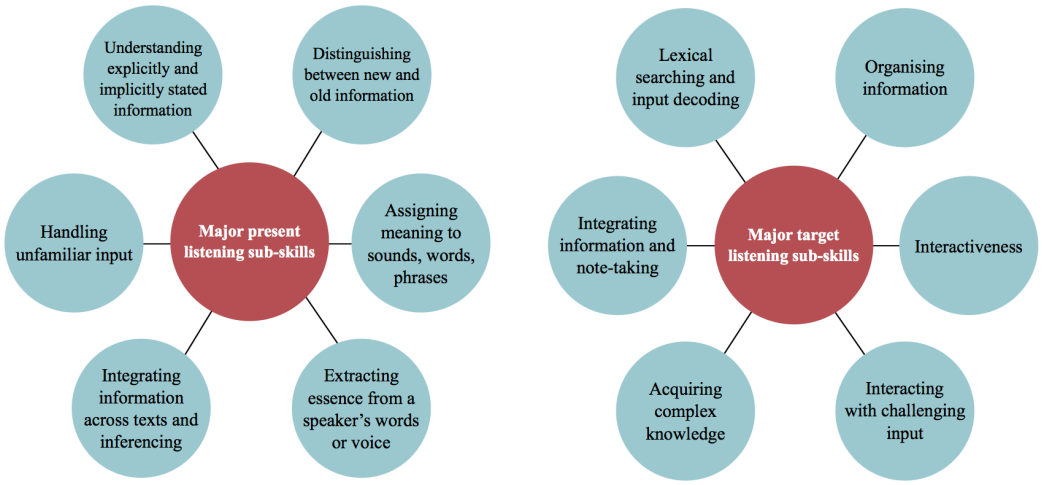


Figure 9-1: Major target and present listening sub-skills

These processes are not exactly the same as those identified in the qualitative strand of this study, but these components (extracted from PCA analyses) do overlap with the seven processes identified in the first strand. For example, two processes are often measured by one component, such as lexical searching and input decoding, or creating intertextual representation and inferencing, which may reflect the interactive nature of the listening process, as acknowledged in the literature (e.g. Field, 2013; Vandergrift & Goh, 2012). Finally, most of the components from PCA analyses in this phase seem to emphasise complex higher-level processes, as previous phases of this study revealed. However, those components, from PSAs extracted in the present study, seem to differ from those in Aryadoust et al. (2012), but not by much. Some components overlap in that study, such as Aryadoust et al.'s 'relating input to other materials' with, in the current study, 'integrating information across texts'. Aryadoust et al.'s results also revealed a separate note-taking component. In this study, note taking was clustered with the ability to integrate information. This was because the item 'note taking' in the questionnaire was loaded with items related to the ability to integrate information in a lecture such as 'making links mentally to all the points made in a lecture' (see Chapter 8, Factor 5 in column A). Note taking can be clustered

with the ability to integrate information because, in order to take effective notes in a lecture, the student has to comprehend what is said, choose the main points, and decide how these ideas are developed/integrated in an argument; as Palmer and Pope (1985) emphasise, before noting down information, the content of the material has to be understood and 'all notes that are not accompanied by solid understanding are useless' (p.76–77). Other components in their study, such as concentration and memory, did not appear in the present PCA analyses. Differences between the factors extracted might be due to issues such as differences in the statistical measures applied or participants' proficiency levels.

9.3 L2 lecture-listening model

Data from Phases 1, 2, 3 and 5 discussed thus far suggest that comprehension of orally delivered lectures triggers seven cognitive processes, and that each process features several specific sub-skills that need to be employed to engage in that process successfully. The data also show that lecture-listening requires strategic processing (using cognitive and metacognitive strategies) to control the cognitive processes and their sub-skills. Table 9-1 and Table 9-2 display the abilities needed to comprehend lectures, based on this study. These are presented as three categories: cognitive processes, sub-skills and strategies (see Figure 9-2).

Table 9-1: Processes and sub-skills involved in L2 lecture-listening comprehension

Processes and sub-skills	**Input decoding**	**Lexical search**	**Syntactic parsing and propositional meaning**	**Inferencing**	**Building a mental model**	**Creating a text-level representation**	**Creating an intertextual representation**
	• Decoding a word(s) in continuous speech • Decoding recognising a known word(s) • Processing several pieces of information in real time • Paying attention to specific articulated phonemes • Using general pitch movements to distinguish between rhetorical Qs and Qs which need responses • Using a high-pitched tone sentence as a question • Decoding others' speech • Inferring from voice	• Allocating meanings to words • Drawing attention to English names, places, dates, numbers and titles of books or novels • Comprehending metaphors • Linking an aural word to its written form (spelling) • Understanding technical terms • Understanding technical definitions • Noticing keywords	• Parsing continuous utterances and constructing the meaning of an utterance semantically • Dealing with incomplete utterances • Comprehending students' speech despite incorrect grammar • Linking what is heard (content) to syntactic knowledge • Processing complex syntactic structures	• Linking what is heard to background world knowledge • Recognising a speaker's illocutionary intention/ ultimate goal (explicit/implicit) • Recalling information from the same lecture to comprehend the literal meaning of another point • Comprehending that another student's answer is wrong from the instructor's speech	• Identifying a lecture's title • Making appropriate judgements about the quality of information heard while listening • Identifying supporting ideas underpinning the central one • Identifying peripheral information unrelated to the topic without a lecturer pointing it out • Considering redundancy in terms of exact repetition • Considering redundancy in terms of synonym use • Considering redundancy in terms of paraphrasing	• Reviewing the flow of ideas in the whole text • Ending up with a coherent meaningful construction of what has been heard • Associating different pieces of information in the whole text • Identifying the central gist idea of a lecture without it being explicitly pointed out • Processing a	• Connecting content from different speakers and content generated from discussions • Linking relevant pre-reading to the current lecture • Linking previously heard subject-specific knowledge (previous lectures) to the current lecture • Connecting aural input to a textbook while listening • Completing assignments/

Processes and sub-skills	tone • Perceiving prosody (e.g. intonation, stress) • Decoding fast speech • Understanding different English accents • Recognising words' pronunciation • Listening to a group of word, not single words	• Identifying information about a course, such as due dates and exam dates given by lecturers • Learning vocabulary and pronunciation from lecturers • Using the grammatical structure of a new word to understand it • Understanding many high-level words • Relating a word or a term given in Arabic to what the lecturer is saying in English • Understanding synonyms of words		• Drawing a parallel between what is said literally and metaphorical meaning • Making inferences to understand • Making unclear parts of input comprehensible • Understanding explicit information • Understanding new (unfamiliar) information • Predicting answers to questions through inferencing • Using (local) cultural knowledge to understand utterances	• Considering redundancy in terms of glossing • Integrating/connecting an incoming piece of information with information immediately preceding it • Resolving anaphors • Recognising when the speaker indicates new points • Recognising when the speaker evaluates information before or after transmitting it • Using examples to infer/deduce the meaning of a key, detailed, relevant point • Associating different pieces of information to keep up with a main point expressed in a section • Recognising new information	lecture presented in an unfamiliar way • Following a lecture's structure while listening and visualising it in one's mind • Discovering similarities and differences between ideas • Mentally linking all points being made while listening to them • Recognising when the speaker summarises points made earlier • Remembering most of the information given in a lecture at the end of class	sitting exams after listening based on what been heard in lectures • Connecting aural input to clues given on a whiteboard while listening • Connecting information heard in a lecture to other materials after listening (e.g. references, textbooks) • Connecting aural input to clues given on slides while listening • Taking notes while listening • Connecting current content to the next lecture(s) • Integrating information from multiple lectures after

						• Understanding large amounts of information conveyed very quickly	listening • Integrating information from different aural texts while listening (e.g. videos) • Recalling what has been processed in the same lecture to use in exercises and examples during the lecture • Doing extra reading to understand the field in general

Table 9-2: Strategic processes involved in L2 lecture-listening

Metacognitive strategies	Cognitive strategies
• Making a conscious decision to listen • Motivating oneself by taking an interest in the subject matter • Clearing one's mind of any distractions • Redirecting attention when it drifts for any reason • Checking new interpretations derived from listening against prior understanding of the topic gained from conducting background reading for a lecture • Discarding irrelevant interpretations by verifying initial hypotheses in relation to later information or by determining hypotheses to contradict information heard when listening • Using background reading to identify and clarify words/ ideas not understood • Asking the lecturer to explain a certain point or quickly asking their classmate about something that has not been understood • Checking understanding when another student asks a question and the lecturer answers. Thereby, the new information gained can enable the listener to address any discrepancies in understanding	• Stopping to think about high-level words (meaning or pronunciation) • Stopping to think about a word's (familiar or unfamiliar) pronunciation and spelling • Stopping to think about the meaning of specific parts of the input • Translating words into L1 while being spoken • Transferring knowledge already understood in L1 to L2 to assist with comprehension • Guessing the meaning of unfamiliar words • Using the speaker's body language to infer things found to be problematic • Predict details, such as words in a message, before they are spoken • Preempting what will be heard based on initial discussions with the lecturer at the outset of a lecture • Familiarising oneself with the linguistic content of the lecture before listening (through background reading) • Forecasting the general gist of the content (e.g. using preview or brainstorming questions asked by the lecturer prior to a class) • Anticipating what will be heard in a lecture based on (discipline-specific) information that is brought to mind, often at the beginning of a class • Invoking prior experience/world knowledge that is not part of the content to facilitate understanding information

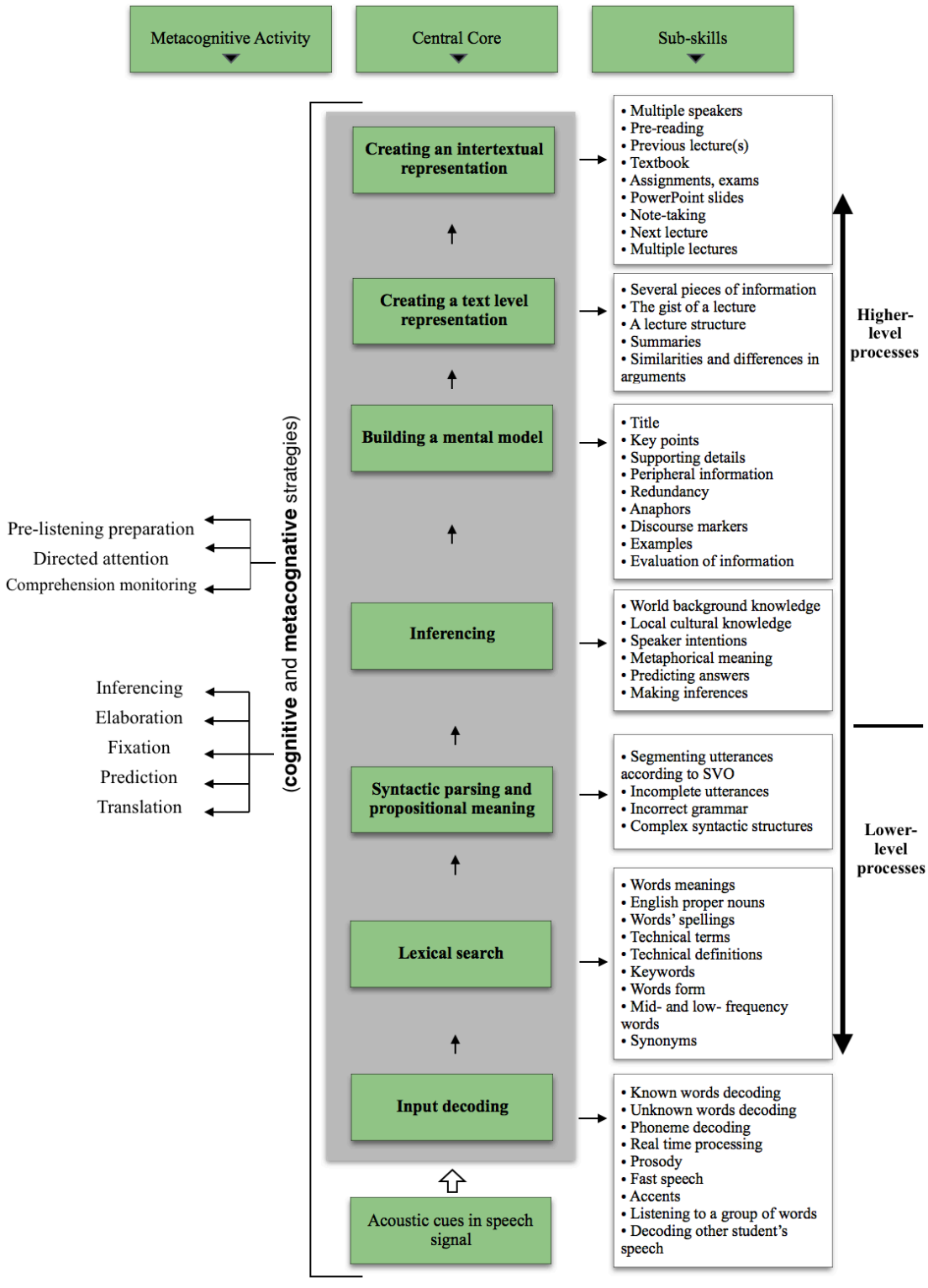


Figure 9-2: L2 lecture-listening model

The current study indicates, in particular, that listening to lectures forces attendees to tap into higher-level processes: inferencing, building mental models and creating text-level and intertextual representations. It also requires higher-level major sub-skills extracted from the PCA analyses, such as integrating information and note-taking. This supports the emphasis placed on the necessity of complex 'meaning enrichment' processes in academic listening, as Field (2011, p.110), Taylor and Geranpayeh (2011) and Olsen and Huckin (1990) note.

Further, this study emphasises the importance of the sub-skills associated with cognitive listening processes. Deconstructing the listening process into sub-skills is in accordance with the idea that listening is a complex (Vandergrift & Goh, 2012) and multidimensional process (e.g. Aryadoust, 2013; Buck, 2001; Buck & Tatsuoka, 1998). Several of the sub-skills identified in this study have also been acknowledged in the L2 academic listening literature (e.g. Aryadoust, 2013; Buck & Tatsuoka, 1998; Powers, 1986; Sawaki & Nissan, 2009; Zhu & Flaitz, 2005), although there are a number of differences between the findings of my research and previous studies on listening comprehension needs. For example, Aryadoust (2013) recently developed a list of sub-skills needed for academic listening (seminars, tutorials and lectures) based on a qualitative analysis of the IELTS listening test items and the language assessment literature. Some of the sub-skills identified in my study are similar to those listed in Aryadoust's model, including easily understanding important commonplace names, dates and numbers; understanding the relationships and arguments between ideas in a lecture and how each idea relates to another; identifying a lecture's main topic and distinguishing major ideas, details and examples; identifying how the lecture continues, starts and ends; easily taking notes of important pieces of information in a lecture; keeping up with and understanding lecturers who are speaking fast; recognising and understanding other students (peers) contributing to a lecture despite grammatical mistakes in their speech; connecting information of a lecture to a textbook and handouts or slides; and understanding short technical descriptions.

At the same time, some of Aryadoust's sub-skills did not appear in my data, such as differentiating between humorous anecdotes and jokes and facts; understanding lecturers who are non-native English speakers better than the native speakers;

understanding language expressing spatial relationships and directions; understanding simple descriptions of feelings and wishes; understanding radio and TV news programmes; and understanding the meaning and the purpose of most idioms, cultural references, word play and irony. This difference in the findings was probably due to the nature of the listening passages in my study and those in Aryadoust's study, as my study has focused only on lectures delivered by non-native speakers of English as well as the nature of the content delivered in these lectures that, for example, does not relate information to a map or talk about spatial relationships and directions. Furthermore, a number of sub-skills appeared in my study that were not identified by Aryadoust (2013). These include the importance of perceiving prosody and pitch movements while listening; recognising words' pronunciation and understanding high-level words and synonyms; recognising redundancy easily and linking relevant pre-reading to the current lecture; and predicting the lecturer's questions through inferencing while listening, or even using body language as a cognitive strategy to infer things found to be problematic. These differences were probably because the lectures in my study were derived from a real target-language use situation in which redundancy might occur more often and a listener has to think about questions in a real-time listening setting. Also, the lecturers might give synonyms for difficult words when they think that their listeners do not understand them, and this might affect their understanding of the content.

Powers (1986), as mentioned previously in Chapter 2, performed an analysis of the TOEFL listening exam and literature and developed a taxonomy of 17 listening micro-skills thought to be important while listening academically. These micro-skills match a number of sub-skills found in my study, especially those related to the lecture structure (main topic, major ideas, examples, supporting details and discourse cues) and those targeting key vocabulary and phonological aspects (accents, speeds, sentence stress and pitch), as well as recognising different speaker's styles, determining whether the lecture was unplanned or informally structured and understanding both lectures that have no clear organisation and those that are planned and formally structured. Powers (1986) also mentioned that listeners need to understand sarcasm, humour and jokes in lectures and different modes of a lecture (i.e. audio, audio/visual or spoken in real-life) and that listeners need to be able to retrieve information from their notes at the end of a listening encounter. However,

these did not appear in my study except recognising a spoken lecture given in a real-life situation. Perhaps this difference is because my study focused on real-time listening in a lecture hall but did not analyse what a listener might do later, such as retrieving information jotted down while listening and using it to review the lecture. In addition, understanding sarcasm and humour, which Aryadoust (2013) also found, did not appear as a listening need in my study perhaps due to the small corpus of the study. A larger corpus might reveal the need for this, but this is not clear in my study.

Previous studies on academic listening comprehension needs, as mentioned previously, also include the work of Sawaki and Nissan (2009), who compared the performance of non-native speakers of English on the TOEFL iBT with their performance on a closely related target-language use task consisting of listening to videotaped lectures. Sawaki and Nissan (2009) found that listeners needed to 'listen to the instructor explaining details of assignments and due dates', 'apply concepts that were explained orally in order to complete tasks', 'listen to classmates' questions' and 'take notes in class' (p.12). These sub-processes have also been essential in my study, as the study data generally revealed that listeners need to engage in sub-processes related to the processes of creating text-level and intertextual representations. For example, my study highlighted that listeners need to recall what has been processed in the same lecture (often, instructions are given orally) to use in exercises and examples during the lecture (a text-level representation sub-process). Listeners also need to connect content from different speakers as well as that from discussions and from listening to other students (in the form of questions, clarifications or short contributions), and take effective notes as they listen (intertextual representation sub-processes). In my study, however, the listeners did not have to use details from the lecture to know how to complete their assignments (or even their exams). In the lectures I analysed, there were no incidents of such explanations, perhaps because I was analysing a small corpus. Also, perhaps the lecturers and students I interviewed did not talk about that probably because it was not directly related to the content of lectures, or perhaps because this information might be written in the course syllabus. Further, Sawaki and Nissan's (2009) study did not stress the importance of these skills, although they were described as sub-skills thought to be needed in academic listening comprehension in their study, namely 'listen[ing] to classmates giving oral presentations' and 'listening to guest speakers giving oral presentation' (p.12). In my

study, listening to guest speakers was not identified, perhaps because the department rarely hosts guest speakers. Also, the students that participated in my study were required to deliver oral presentations, but both the students and lecturers noted that listening to content from other students was not thought to be as important as the main lecturers' speech.

Moreover, a study by Zhu and Flaitz (2005) found that international university students in the United States require several listening sub-skills, which are: the need to distinguish what parts of a lecture are important, to juggle listening and note-taking, and to understand technical terminology. All of these sub-skills were also identified in my study, except that Zhu and Flaitz (2005) also found that listeners need to understand idiomatic expressions and phrasal verbs, such as when a professor says 'take up the assignments'. This is a sub-process that was not mentioned in my study by the lecturers and students, perhaps due to the different linguistic backgrounds in the two studies, so the need for this process is still unclear here. Zhu and Flaitz (2005) also found that students need to be able to listen to recorded messages about their courses, such as signing up for a course by telephone, while my study focused on subskills needed while listening to a lecture. Perhaps investigating academic listening outside the lecture hall might reveal other necessary listening sub-skills that may have an influence on L2 lecture listening.

Finally, as described in Chapter 2, several sub-skills identified in this study were similar to those listening sub-skills listed in the speculative sub-skill taxonomies (e.g., Richards, 1983; Flowerdew, 1994). Further, although most of these sub-skills appeared qualitatively in my study, many of the sub-skills featured here are similar to some that were statistically tested in research-based taxonomy studies, such as Wagner (2004) and Liao (2007). Both works focused on two sub-skills, namely, the ability to understand explicitly stated information and to understand implicitly stated information. I also found these two sub-skills to be important.

To date, studies on students' academic listening comprehension needs have provided useful information on what skills listeners need to function successfully in a real university setting. My study has also identified a wide array of academic lecture listening sub-skills that are important for academic success. At the same time, my study has expanded the scope of the investigation of what skills lecture listeners

require to make the most out of their lectures and what is necessary to understand lectures fully. I have therefore identified about 80 listening sub-skills which emphasise the complex and sophisticated sub-processes needed while L2 lecture listening. My findings confirm other sub-processes that have received little attention in the literature, particularly in academic listening needs analyses, and I have combined these sub-skills into one study based on data collected in an academic listening target-language use situation. These sub-skills include the importance of understanding metaphors, linking an aural word to its written form, connecting a current lecture to the next lecture, making unclear parts of input comprehensible, dealing with incomplete utterances, discovering similarities and differences between ideas in a long lecture and integrating information from multiple lectures, among others. I then linked these sub-skills to the more general cognitive listening processes highlighted in this study, which has rarely been done in previous listening comprehension needs analyses studies.

This study also supports others' findings that a variety of listening strategies can be beneficial and necessary for L2 academic lecture comprehension (e.g. Flowerdew & Miller, 2005, 2014; Imhof, 1998; Mason, 1994). Generally, most of the strategies identified in this study are related to the language learning literature (e.g. O'Malley et al., 1989; Vandergrift, 1997, 2003; Vandergrift & Goh, 2012), which has described listening strategies in terms of metacognitive and cognitive strategies as explained earlier in Chapter 2. Other studies have focused on lecture comprehension strategies in real target situations. Imhof (1998), for example, identified several listening strategies that might be needed for university students, arguing that using content-related strategies before, during and after a lecture (e.g. thinking about the expected subject, taking notes and looking up new vocabulary, thinking of how to use information heard later, watching the speaker's body language and asking for clarification) makes for good listening in instructional situations. This perspective was confirmed in my study. However, Imhof (1998) also mentioned other strategies that could improve academic listening that did not emerge in my data, such as planning notes before listening, realising when a speaker contradicts himself/herself and rephrasing a lecture in one's words after listening.

As far as aural comprehension is concerned, Field (2013) (see 2.3.2.1) argues that

academic listening involves five processes. But Field's listening-processing model, while often used in listening assessment contexts, has limitations that do not fully reflect real-world processing. First, the processes in Field's (2013) model are not fully explained in the sense of what specific sub-skills are needed to employ these processes effectively (what a listener must do), though Field generally emphasises targeting specific sub-processes when teaching listening in his work in general (Field, 1998; 2011). Second, Field's model does not include the process of creating intertextual representations (dealing with multiple input modes and texts), while Khalifa and Weir (2009) do include this process in their academic reading cognitive processing model. In fact, this process cannot be underestimated in real-life situations, since there is evidence for its importance, particularly to content knowledge.

Stromos and Braten (2002), for example, state that students who develop foundational domain knowledge should then find using multiple sources 'easier [and] more profitable' (p.221). They examined undergraduate law students who were reading 20 self-selected texts and supplemental literature. The students were working to keep up with lectures and to pass a final examination that tested their content knowledge and ability to apply legal knowledge to analysing problems. Using think-aloud sessions, they found that the number of links students made between sources/ content from a single text – 'primary endogenous links' – decreased from a first session to a second one. They also noted an increase in the number of mental links the students made between sources beyond the task's context, such as notes from lectures and previous reading. The increased number of 'exogenous links' indicated that the students had become less bound to the particular texts they read and had expanded their comprehension by increasing the connections they made to include additional resources. Stromos and Braten also mention that the participants who scored highest in a final exam had made the highest proportion of 'exogenous intertextual links'. Using sources beyond the task context, in the form of lecture or reading notes, led to higher test scores than simply relying on 'secondary endogenous sources'. The highest scorers might have profited from their attempts to construct a broad, integrated understanding of the subject matter (i.e. creating an intertextual representation), which probably boosted their achievement. Interestingly, one participant who performed poorly in a word recognition and non-word decoding test used multiple sources in an effective way and achieved one of the highest scores

amongst takers of a law exam. It is possible that developing higher-level reading skills, such as using efficient linking strategies, may have enabled this student to overcome his lower-level reading problems. His systematic use of notes, monitoring and revising his understanding led Stromos and Braten to conclude that 'competent academic reading among postsecondary students may not be captured through assessment of lower-level reading skills (e.g. word recognition)' (p.223). This might explain why respondents in the present study put more emphasis on higher-level processes than lower-level ones. Perhaps when listeners have content knowledge presented more as key points and details are presented on slides in front of them, or have access to lecture materials before a class and know the topic of a lecture beforehand, engaging in these aspects of a lecture might help to overcome problems at a lower linguistic level.

Third, although Field's model illustrates that comprehension monitoring and inferencing are part of academic listening, more focus on cognitive and metacognitive strategies to control listening processes is clearly needed, as Vandergrift and Goh (2012) confirm. Finally, one difference between Field's (2013) model and that of the present study may be partly due to Field's use of lectures derived from test materials, not real lectures taken from actual situations. For example, in a real-lecture context, as shown in this study, a student is expected to know technical words, integrate many lectures as part of a course, listen and look at slides presented in front of them, which conventional comprehension tasks may lack. Finally, Field's empirical work is generally based on L1 and L2 expert listening, but the data in this study were generated from participants with more limited L2 language knowledge. In other words, processing problems helped to identify listening processes that are known to be covert to some extent. This seems to align with the claims made by Laviosa (2000) and Ericsson and Simon (1993), i.e. that some automatic processes might become clearer when comprehension breaks down.

Hence, because listeners should employ complex processes and use multiple sub-skills and strategies to learn their subject matter, this does indeed support Bodie, Worthington, Imhof and Cooper's (2008) contention that lecture-listening is a 'challenging' type of listening, as opposed to 'easy' types of listening, such as listening to music. To accurately represent real-world processing as it occurs in a real-

life TLU situation, lecture-listening imposes cognitively complex demands on the listener, as argued by Field (2011, 2013), Goh (2013) and Lynch (2011, 2015). Further, this study provides support for Goh and Aryadoust (2014), who urge the deconstruction of listening processes into sub-skills, and for Bachman and Palmer (2010), who argue that strategic processing must be part of the construct of language ability. Based on these findings, this study recommends that a description of the academic lecture-listening construct should reference the processes, sub-skills and strategies employed in listening.

9.4 Triangulating NA data

To triangulate NA data, the current study gathered data from several sources (i.e. real-world lectures, students, lecturers and expert judges) using several methods (i.e. corpus and discourse analyses, stimulated recalls, interviews, an expert panel review and questionnaires). Conducting NAs is 'a complex undertaking' because it involves different perspectives (Graves, 2000, p.100). Long (2005b, 2015) and Serafini et al. (2015), among others, have suggested that using two or more methods and sources can increase NA validity and reliability by tracking inconsistencies in data. This section triangulates data obtained from questionnaires (Phase 5) with those from lectures, interviews, stimulated recalls and an expert panel (Phases 1–4).

Students' questionnaire responses concerning what listeners must utilise during lecture-listening were triangulated with qualitative data from lectures, interviews and expert panel analyses. Broadly, the students identified 78 sub-processes that are 'usually' or 'always' needed. These largely correlated with the target listening needs identified in previous phases. For example, the sub-skill of understanding key points, which the questionnaire responses identified as 'usually needed' (M=3.49), was also considered a target cognitive need in both lectures and interview analyses. However, the questionnaire responses also identified four sub-processes that are 'sometimes' needed (means ranged from M=2.54 to M=2.10), which previous phases showed as already occurring in the study's context. For example, in the questionnaire, predicting vocabulary is important to be used before lecture-listening but considered 'sometimes' needed (M=2.21). In interviews, however, some lecturers expressed a need for listeners to engage in such a cognitive prediction strategy, especially in L2

settings.

Students' questionnaire responses about their listening problems were triangulated with stimulated recalls and interviews. Overall, there was a significant mismatch between the quantitative and qualitative data, with some similarities regarding present listening needs. Of the 85 sub-processes, the questionnaire identified 42 as can 'usually' or 'always' do during lecture-listening (these sub-processes ranged between M=2.57, 'usually', to M=3.51). This suggests that these 42 sub-processes are not serious hurdles confronting students during lecture-listening. However, the stimulated recalls and interviews identified most of these 42 sub-processes as challenging areas for certain students in this particular TLU situation. For example, the sub-skill 'understand the meaning of many words in English' was identified as 'usually' can do/know when listening to lectures (M=2.96) in the questionnaire. Meanwhile, three low-scoring listeners reported having lexical search problems when allocating meanings to words eight times while listening during stimulated recalls. Further, during the interviews, four lecturers acknowledged nine times that vocabulary can be an obstacle. Similarly, the questionnaire showed that the sub-skill 'use effective note-taking' as 'usually' can do, so it is not very difficult (M=2.91). However, three lecturers noted four times and one student mentioned that certain listeners struggle with note-taking. Also, in response to an open-ended questionnaire question, 16 students wrote that they wished to develop their note-taking. For 17 sub-processes, there were no discrepancies between qualitative and quantitative views; thus, these sub-processes were identified across the board as challenges during lecture-listening. For instance, data from the questionnaire, lecturer and student interviews and stimulated recalls all showed that understanding technical terms may cause difficulties during lecture-listening. Finally, 26 sub-processes could not be triangulated because previous phases did not identify them as difficulties; instead, they generally appeared to be target listening needs only. For example, the lecture analyses showed that listeners must identify pronouns and link them to their antecedents, while other phases did not yield any data regarding this sub-skill.

In sum, the questionnaire findings regarding what a listener must do to engage in and process lectures (target needs) generally agree with the findings from the previous qualitative phases. Thus, there is a fair consensus between lecturers and students regarding which sub-processes are important for processing lectures. This finding

agrees with Huang's (2010) observation of an overlap between undergraduate and graduate students' and instructors' perceptions of which writing skills are important for successful course completion. In contrast, there was significant divergence regarding what students struggle with while listening (present needs). The students, in their questionnaire responses, tended to perceive several sub-processes as easier than the lecturers or students who were interviewed did. This agrees with NA studies that have highlighted a mismatch between students' perceived present needs and those identified by instructors or lecturers (e.g. Houtven et al., 2013; Huang, 2010; Zhu & Flaitz, 2005). This shows that students do not have a clear understanding of their language (listening) problems. Both Houtven et al. (2013) and Huang (2010) argue that this may be because learners cannot identify challenges at the level of unconscious incompetence that make them aware of their weaknesses. Houtven et al. (2013) found that more experienced third-year students were better able to identify needs than their first-year counterparts; however, the present study could not differentiate participants by year in the questionnaire analyses and so all students from the three years of study were pooled together.

9.5 Sequencing NA data

This section discusses the reliability and validity of the data-sequencing approach used to determine academic listening needs in this study's TLU situation, as reflected in *the methodological step of Phase 4* in this study.

Despite the fact that comprehensive NAs are usually not possible, for practical reasons, such as lack of money, time and access to NA sources, as Serafini et al. (2015) point out, the data collected in Phases 1–4 led to seven cognitive processes, 81 sub-skills and 22 strategies that listeners need to utilise in order to process lectures effectively. The data-sequencing approach started with Phase 1, using corpus and discourse analyses of lectures, which resulted in those seven processes being deconstructed into 37 sub-skills and a single cognitive strategy (translation and transfer). Listening to lectures, examined in Phase 1, led to 22 real-time processing problems related to processes, sub-skills and strategies, as the stimulated recalls in Phase 2 revealed. Based on these two phases, Phase 3 built substantially on the findings from Phases 1–2; and, furthermore, the data-sequencing done during Phase 3

helped to reveal additional sub-processes when interviews were used. For example, lecturers talked about 41 sub-skills and eight strategies that can be added to the set of cognitive listening needs in the present study. Thus, each time I sequenced data I obtained more data based on data already sequenced, which may confirm the greater comprehensiveness of NA data.

After obtaining the data sequenced in Phases 1–3, Phase 4 aimed to examine the comprehensiveness of the data sequenced. Phase 4 shows that, based on some selected parts of the data from previous phases, the expert judges consulted during Phase 4 generally approved of most of the interpretations of sub-processes. Those judges did not think there were other sub-processes omitted from the data, except for a few sub-processes that they thought were needed: using local cultural knowledge, mentally linking all points being discussed and visualising/imagining the lecture's structure in one's mind while processing speech. As a result, what was gathered and sequenced as listening sub-processes in Phases 1–3 helped to reveal a significant number of sub-processes that a listener might need when listening to lectures in a particular TLU situation. Thus, using the sequencing approach in NA lends support to the claims made by Brown (2009), Long (2005b) and Long (2015) that sequencing NA data may help to produce data richer in quality rather than quantity.

9.6 Conclusion

Based on its findings and discussions, this study suggests that academic listeners need to employ a wide range of processes, sub-skills and strategies to comprehend input in an actual lecture context. It is evident from the cognitive abilities identified that L2 lecture-listening places significant demands on the listener as s/he has to draw on higher-level processes, which are often neglected in conventional comprehension tasks, as Field 2011 argues – such as the need to process a lecture in a hierarchical manner (topic, key points, details, sub-details), matching what is heard aurally to what is on the whiteboard and integrating information from multiple lectures. This study also shows that listeners need to engage in lower-level processes, which results in activating higher-level processes. However, lower-level processes may be rather complex during lecture-listening. This might be because lecture-listeners have to process technical words, low- and mid-frequency words and complex syntactic

structures. This study thus supports the proposition that lecture-listening places complex cognitive demands on the listener, as argued by, for example, Taylor and Geranpayeh (2011). Thus, it is recommended that these processes, sub-skills and strategies be made part and parcel of the description of the L2-listening academic-lecture construct. Further, this study has reported on an NA methodological model that utilised several methods and sources and shows that data-sequencing, in particular, is both applicable and useful, since it meets several academic listening needs, helps to get additional, relevant views and adds further views based on data built on data by means of sequencing.

The next, concluding, chapter presents the implications and limitations of this study, along with future research recommendations

Chapter 10 Conclusion

10.1 Introduction

This study's main goal was to explore the lecture-listening needs of Saudi students, focusing, in particular, on processes, sub-skills and strategies using a needs analysis (NA) model. This chapter begins by presenting brief answers to the research questions (10.2). The contributions and implications are then discussed in 10.3 and 10.4, respectively. The final section (10.5) outlines the study's limitations and directions for future research.

10.2 Summary of findings

Drawing on the listening comprehension and NA literature (Chapter 2), this study conceptualised the mental abilities involved in real-world lecture-listening behaviour as processes, sub-skills and strategies. These abilities were expressed as target needs (i.e. TSLA, TSUA), present needs (PSA) and learning wants (LCSA) to answer the following questions.

The overarching question was 'What are the academic listening needs of L2 students listening to lectures in the English Language and Literature undergraduate programme (ELL) at King Saud University?' To answer this question, this study went through four phases that utilised different data-collection methods and sources/stakeholders. The following is a summary of the findings on five subordinate questions related to this overarching question.

Question 1a: What target linguistic needs do ELL undergraduates require, as identified in lecture transcripts from the ELL programme?

The corpus-based analysis uncovered data related to target-situation linguistic analysis (TSLA). Six *target linguistic listening needs* were identified:

- Process lexically dense texts with nearly one-third content words;
- Process many high-frequency words (e.g. 'imagery') as well as some mid-frequency words (e.g. 'satirist') and low-frequency words (e.g. 'burlesque');

- Process technical terms (e.g. ‘softeners’, ‘syllabic’, ‘scansion’);
- Process formulaic expressions, often used by speakers to organise discourse structure (e.g. ‘at the end of’, ‘first of all’, ‘let’s look at these’);
- Process speech delivered at an average or moderately slow rate (about 125 wpm); and
- Process complex syntactic structures, specifically ‘which non-restrictive relative clauses’, which are used by speakers to embellish a particular point.

Question 1b: What listening processes and processing sub-skills do ELL undergraduates need to engage in when listening to lectures in the ELL programme?

The analysis of discourse uncovered data vis-à-vis target-situation use analysis (TSUA). The following seven processes, namely three lower-level processes and four higher-level ones, which also involve 37 sub-skills, must be activated during lecture-listening as *target cognitive listening needs*:

- Input decoding process—involves engaging in sub-skills, namely perceiving accenting of words/phrases, recognising specific phonemes in phonetics classes, decoding at least 10 student speakers’ speech in a single lecture and drawing inferences from the speaker’s tone.
- Lexical search process—involves retrieving words’ meanings and English proper nouns as well as words’ metaphorical meaning.
- Parsing and establishing propositional meaning—includes processing unfinished utterances, plus those with incorrect grammar, based on text, co-text or prior knowledge.
- Inferencing process—necessities listeners inferring speakers’ intentions, bringing world knowledge to process literal utterances and recalling information already processed in the same text to understand another point.
- Building a mental model process—requires listeners to identify a lecture’s topic, key points, several supporting details, peripheral information and redundancies as well as to resolve pronouns and process examples, discourse markers and speakers’ personal evaluations of points.
- Creating a text-level representation process—entails listeners recognising similarities and differences between spoken ideas, identifying recapped

information, constructing the general gist/idea and reviewing the flow of ideas heard in the entire text.

- Creating an intertextual representation process—requires listeners to process input currently being heard by integrating it with meaning derived from previously heard lectures, prior reading or words/phrases written on whiteboards or PowerPoint slides or in textbooks, or by constructing content based on different input given by other students.

Question 1c: What real-time processing problems do ELL undergraduates experience during listening to lectures in the ELL programme?

Stimulated recalls uncovered data on present-situation analysis (PSA). As *present cognitive listening needs (lacks)*, 22 real-time processing problems associated with the seven processes in Q1b were found:

- Low-scoring listeners were unable to engage in input-decoding successfully. They showed difficulty in knowing technical words, identifying unknown words and substituting them with known words rhyming with it. Further, they had difficulty recognising why some words/phrases received more phonetic emphasis as well as with processing speech in real time.
- Low-scoring listeners were unable to engage in a complete lexical search. They showed great difficulty allocating meanings to words, recognising synonyms or even linking an aural word to its written form in a textbook if they did not know the spelling of that word.
- Low-scoring listeners showed minimal ability to engage in successful parsing and establishing propositional meaning. They did not quickly combine words and segment utterances according to their syntactic structures to obtain propositions.
- Both low- and high-scoring listeners engaged in incomplete inferencing, although for the latter it did not affect their global comprehension. Deficiencies related to this process included struggling with inferring a speaker's intention, drawing a parallel between literal and metaphorical meaning, understanding a text whose relevant world knowledge was absent in the listener's mind and making unclear parts comprehensible.

- Low-scoring listeners were unable to engage in building a mental model successfully. They experienced difficulty in integrating several points to construct a key point expressed at a section level in the lecture, instead only picking out key words from the section heard. Additionally, they failed to recognise theoretical supporting details even if these were repeated; however, examples considered as details might be given more attention in this case than theoretical details. A discourse marker announcing a key topic to be discussed might also go unnoticed, and then a failure to recognise the key point behind the next utterances introduced by that discourse marker occurs.
- Low-scoring listeners were unable to engage in the successful creation of a text-level representation. Constructing a coherent whole text, relating numerous ideas and processing unfamiliar lecture organisation were obstacles for them.
- Low-scoring listeners were also unable to create intertextual representations when they failed to link aural input to written input from PowerPoint slides, textbooks or students' discussions.
- Low-scoring listeners also did not use two metacognitive (directed attention, comprehension monitoring) and three cognitive strategies successfully (elaboration, fixation, mental translation) to solve their comprehension problems.

Question 1d: What do lecturers perceive to be the target, present and language-learning academic cognitive listening needs of ELL undergraduates?

The interviews revealed data on three types of needs. Lecturers expected their listeners to engage in 41 sub-skills associated with the seven processes identified earlier as *target needs*. Previous discourse analysis revealed many of these, so only additional identified needs are included here. Lecturers require their listeners to do the following to varying extents:

- Process fast speech and multiple accents in English and notice words' pronunciations as part of input decoding;
- Process technical terms and definitions even if speakers do not explicitly identify them and notice key words as part of lexical searching;

- Link information heard, particularly in linguistics and translation lectures, to English syntactic knowledge as part of parsing;
- Infer questions' answers and process complex ideas as part of inferencing.
- Determine the importance of each piece of information and not attach equal importance to all points heard as part of building a mental model;
- Use processed information in assignments and exams, engage in note-taking, connect heard information to videos while listening or when reading references and textbooks after listening, carry forward information to the next lecture and integrate meaning across multiple lectures over the course of a semester as part of creating intertextual representations; and
- Use three metacognitive strategies (pre-listening preparation, directed attention, comprehension monitoring) and three cognitive strategies (inferencing, prediction, elaboration) and avoid two cognitive strategies (fixation, translation) to listen to lectures successfully.

Furthermore, lecturers discussed 30 areas in which students have difficulties, i.e. *present needs*. Some of these lacks were identified in stimulated recalls; those that were not are included here. Certain listeners struggle with:

- Processing speech immediately and being willing to ask a speaker to repeat what has been said, understanding fast speech, many accents and listening to single words.
- Processing complex syntactic structures and language proficiency in general.
- Predicting answers to questions and comprehending complex theoretical ideas.
- Making decisions themselves about the relevance of each piece of information, distinguishing continuing from new points in a text and recognising examples to deduce meaning
- Discovering similarities and differences throughout a text and recognising a speaker recapping information given previously.
- Using information from lectures in assignments and exams, integrating information from multiple lectures, taking notes, understanding lectures when they have not completed prior reading or lacked essential subject-

specific knowledge, relating what has been said in lectures to textbooks, and understanding theoretical information before applying it to practical activities.

Lecturers also identified a few *listening-learning wants*; particularly, they want their listeners to develop these sub-skills:

- Taking notes.
- Prioritising information given in a lecture and connecting details to the main points.
- Reading in English in general (particularly to improve general knowledge and vocabulary), not only books on topics in their field.

Question 1e: What do ELL undergraduates themselves perceive to be their target, present and language-learning academic cognitive listening needs?

Interviews uncovered students' perceptions regarding target and present needs and learning wants. Twenty-nine sub-skills related to seven processes identified earlier were thought important by listeners to engage in (however, there were few mentions of each sub-skill; perhaps one participant talked about a sub-skill, as opposed to lectures). These included:

- Perceiving prosody and recognising the separate pronunciation of a word in connected speech are necessary to engage in input decoding.
- Accessing words' meanings, listening for key words important to surrounding words' meanings, knowing technical words and definitions are necessary for lexical searching.
- Activating world knowledge to comprehend a text as well as recalling information and remembering it to process another relevant point as these are essential to engage in inferencing.
- Distinguishing new points from continuing ones; identifying key points, details and examples; judging the importance of points in a text is required to engage in building a mental model.
- Following a hierarchical lecture structure, extracting gist and noticing when a speaker is recapping are essential for creating a text-level representation.

- Taking notes, activating relevant content knowledge, connecting aural input to notes on whiteboards, recalling prior reading while listening and completing assessment activities after lectures are required as part of creating an intertextual representation.
- Using pre-listening preparation, directed attention and comprehension monitoring metacognitive strategies as well as inferencing, prediction and elaboration cognitive strategies.

Students also identified 19 *listening present needs* associated with seven listening processes, mainly these:

- Decoding other students' speech and perceiving prosody.
- Understanding technical terms or recognising that when an English proper noun is given it is the name of a person or thing.
- Activating relevant general knowledge to process content, and knowing which ideas stated earlier need to be recalled and integrated with other points later in the text.
- Discerning that something is a repeated point and not a new one and deducing meaning from examples.
- Discerning a lecture's structure and constructing gist.
- Note-taking, relating information heard in lectures to tests/assignments and linking speech to notes on a whiteboard coherently.

Students mentioned a few *learning-listening wants*:

- Increasing general world knowledge.
- Noticing pronunciation of letters in words/connected speech.

A questionnaire revealed students' views about three types of needs. In terms of *listening-learning wants*, 30 wants were identified as areas in which students would like instruction. The top five wants were:

- To learn more vocabulary
- To integrate listening with speaking
- To understand different accents in English
- To discern the phonological aspect of sounds in connected speech (e.g. elision)

- To process fast speech

For *target needs*, in general, students identified that the processes of building a mental model and creating a text-level representation are more important. However, with the exception of identifying specific information in a message (lexical search), considered to be the most important sub-process, the following sub-skills were identified as being important than other sub-processes mentioned in the questionnaire: understanding the general idea/gist of a message, resolving pronouns, recognising new information, recognising discourse markers and identifying key points. These sub-skills were found to be more important than lower-level processes, such as understanding complex syntax and dealing with fast speech. Factor analysis performed on the target needs resulted in the identification of six different major sub-skills thought to be essential in this TLU situation:

- Organising information
- Interactiveness
- Interacting with challenging input
- Lexical search and input decoding
- Integrating information and note-taking
- Acquiring complex knowledge.

For *present needs,* students generally considered themselves challenged by both lower- and higher-level processes. The following difficulties were identified as the most challenging: using a cognitive prediction strategy (particularly, predicting vocabulary before listening), dealing with a lecture with no clear organisational style (creating a textual-level representation), understanding high-level words (lexical search), dealing with copious information (creating a textual-level representation), dealing with fast speech (input decoding) and inferring implicit information (inferencing). Factor analysis conducted on the present needs resulted in the identification of six major sub-skills thought to be difficult areas:

- Distinguishing between new and old information
- Assigning meaning to sounds, words, phrases
- Extracting essence from a speaker's words or voice
- Integrating information across texts and inferencing
- Handling unfamiliar input

- Understanding explicitly and implicitly stated information

Finally, the methodological step of this study (phase 4) investigated how valid and reliable the findings were from the first strand of the study's sequencing approach, based on views from expert judges external to the research context as well as justified proceeding to the second strand of the sequencing approach. While evaluating randomly selected sub-processes obtained from the study's first qualitative strand that endorsed a data-sequencing approach, expert judges generally agreed that the data presented reflected, to some extent, several target and present needs. They added a few additional sub-processes that might also be required during lecture-listening. Hence, what was gathered and sequenced in the first strand appears to be generally comprehensive and reliable, particularly the fact that several sub-processes were found to exist in the lecture-listening construct, which allowed the researcher to proceed to the subsequent quantitative strand.

10.3 Contributions of the study

10.3.1 Theoretical contributions

This study makes several theoretical contributions. For L2 lecture-listening processing, little research has yet examined the specific mental abilities learners must activate in real-world aural processing as opposed to language course/test situations. Drawing on five existing language comprehension models (Field, 2013; Khalifa & Weir, 2009; Aryadoust et al., 2012; Young, 1994; Vandergrift & Goh, 2012) that capture the EAP listening construct, this study formulated a lecture-listening processing model to study the language needs of students during lecture-listening and in a particular TLU situation.

Based on what was found empirically through this study, lecture-listeners must engage in seven automated lower- and higher-level 'processes' that are crucial for achieving complete and accurate comprehension. Although, lower-level sub-processes (or sub-skills) (e.g. the need to recognise words as connected ideas and not just hear single words, access word meaning, and listen to multiple accents) are present in all types of listening, and particularly in general listening, the findings for listening comprehension processing needs indicate there are additional lower-level sub-processes that may be more important during lecture-listening. Additional lower-level

sub-processes, such as processing rhetorical questions, technical terms, formulaic expressions, complex grammatical structures, keywords, mid- and low-frequency words and linking an aural word to its written form in, say, a textbook are also essential sub-processes.

Further, the current study findings strongly support the importance of activating complex higher-level processes when handling information presented in a lengthy lecture. This aspect was clearly evident from the number of mentions of sub-skills for each higher-level process, particularly in the analyses of real-lectures (Phase 1) and the lecturers' perceptions of students' listening target, present and learning needs (Phase 3). More specifically, these findings indicate that lecture-listeners are expected to engage in certain essential higher-level sub-skills: 1) inferring implicit information (e.g. enriching literal meaning with world knowledge or topic knowledge); 2) building a mental model (e.g. making judgements on the relevance of spoken ideas, identifying key points, recognising discourse markers); 3) creating a text-level representation (e.g. at the end of a listening encounter, thus producing a coherent structure of precisely what was heard but in a hierarchical manner); and 4) creating intertextual representations (e.g. coherently linking aural input to other aural/written/visual modals that accompany aural input from the speaker along with taking efficient notes). These sub-skills must be activated in lectures.

The processes that were found empirically in this study generally correspond to the five processes in Field's (2013) listening-processing model currently used for L2 listening. However, Field's (2013) model does not tap into the process of 'creating an intertextual representation', which was found in this study to be part of real-world lecture processing. Nor does Field's model separate the process of inferencing; rather, he combines inference with his building-meaning process. Inferencing, however, becomes a separate category in this current study, as it does in Khalifa and Weir's (2009) model, as inferencing needs to have its own explicit focus in the lecture-listening model as the data in this study clearly demonstrate.

Second, the data show that overarching cognitive listening processes can be deconstructed into their constituent 'sub-skills', and further, that lecture-listeners need to engage in these several different sub-skills so as to activate listening processes successfully. This deconstruction of seven processes produced nearly 80 sub-skills in

total (see Chapter 9 for a full list of these). This step was particularly beneficial, because it details exactly what operations must be executed in the listener's memory to engage in each process successfully. Deconstructing processes into sub-skills (related parts) is not done explicitly in Field's (2013) listening-process model, so a more explicit, complete description of each cognitive operation will help to achieve full cognitive validity of the processing models. Hence, the current study links two views offered in the literature: process-oriented and sub-skill-oriented.

Third, the findings show that lecture-listeners need to use metacognitive (e.g. directed attention) and cognitive strategies (e.g. prediction) to monitor their listening and solve comprehension problems, or even avoid using ineffective strategies (e.g. fixation) that may affect listening success. More specifically, in a real lecture context, it appears that lecture-listeners are expected to use processing strategies, e.g. individual familiarisation with the lecture's linguistic content before listening to it, i.e. undertaking background reading; using the lecturer's body language to infer problematic parts in a lecture; and taking an interest in the subject matter before listening to a lecture. Strategies that have been considered important elements of L2 listening, as in Vandergrift and Goh's (2012) model, are emphasised less in Field's (2013) listening-processing model. This study, therefore, incorporates (metacognitive and cognitive) strategies, in addition to processes and sub-skills, that listeners must use to compensate for any gaps in their understanding so as to monitor all listening processes and understand lectures better.

The lecture-listening processing model developed in the current study combines five language comprehension models found in the literature into a single new model that captures the cognitive demands of the real lecture-listener scenario. Such a model conceptualises cognitive abilities from three perspectives (process, sub-skill, strategy) (see 10.3), and it has been empirically validated by the findings of the current study. This study thus formulates a lecture-listening model and fine-tunes the EAP listening construct already existing in the literature.

This study also contributes to further knowledge of ESP NAs by linking the aural cognitive processing behaviour in the psycholinguistics models to the EAP NA literature. To the best of my knowledge, no study of EAP NAs has examined a single language skill at such a specific level using language comprehension models. Rather,

most NAs focus on identifying general, broad language skills (e.g. listening to radio programmes in English; Kormos et al., 2002). Further, cognitive processes, sub-skills and strategies identified herein are linked to three NA approaches (TSA, PSA, LCSA). These approaches were found to be useful for identifying cognitive academic listening needs. For example, the PSA approach, which is concerned with identifying language difficulties, has led to determining processes, sub-skills and strategies that listeners are unable to engage in during lecture-listening. Related to this issue, Field (2012) argues that successful comprehension can evidence the processes involved in listening. Further, both unsuccessful comprehension (based on PSA findings) and successful comprehension (based on TSA findings), as also found in this study, can help indicate the mental abilities required for successful listening.

10.3.2 Methodological contributions

Unlike the majority of previous EAP listening NA studies which tended to rely on using only a single method and often involved quantitative surveys (e.g. Ferris, 1998; Kim, 2006; Powers, 1986), the approach used in the current study was a mixed-methods one. More specifically, the five-phase NA model in this study used qualitative data in these three ways:

- Analyses of the spoken discourse of audio-recorded real lectures were conducted to show indirect data as automated listening processes and sub-skills.
- These lectures were then used as a stimulus, whereby each student-participant listened to a lecture and articulated what prevented her from achieving accurate comprehension to reveal real-time processing problems then tied to processes and strategies.
- Sub-processes (sub-skills and strategies) that emerged from the analyses of lectures and students' processing problems were then used to obtain further explanations from the subject lecturers and the students who mentioned additional sub-processes to those already found previously.

These quantitative data were utilised in the following three ways:

- Corpus computer tools were used to conduct linguistic analyses of recorded lectures.

- In the bridging phase between the qualitative and quantitative strands of the study, selected qualitative findings were checked which then, in turn, generated quantitative data.
- A closed-ended questionnaire was then constructed, based on the qualitative findings that emerged in the first strand.

These multiple procedures were then combined and sequenced in a specific way. As mentioned earlier (see 2.2.4), when collecting data for NAs, NA researchers, namely, Long (2015) and Brown (2009), urged a data-sequencing approach, i.e. each procedure should build on what is found in a previous procedure. This sequencing approach had already been applied in a couple of NA studies, namely, Serafini et al. (2015) and Houtven et al. (2013). Hence, the current study sought to offer an example of an NA methodological model to endorse sequencing that starts with a qualitative approach and is then followed by a quantitative approach. This model uses different methods that might be followed when designing EAP courses/tests.

Based on this study, multiple methods and sequencing are important when conducting NAs. Different methods reveal different pieces of the puzzle; some methods produce data that confirm the findings of other methods and increase confidence in them, while other methods result in data that add new findings built on findings already gained from other methods. Therefore, different methods have different emphases and also triangulate parts generated by other methods. Finally, because the methods were sequenced and not used simultaneously, these findings can, to some extent, be explained and be relevant to the findings from other methods. For example, discourse analysis showed that decoding multiple speakers' speech (other than the lecturer) is a target sub-skill in which listeners need to engage. Because the same lectures used in the discourse analysis were used as stimuli in recalls, two listeners reported difficulty in decoding other students' speech. Since this target sub-skill was found in both discourse and recalls and was included in the interview guide, one lecturer thought it would be too much to expect listeners in the TLU situation of the study to decode the speech of other students. This sequencing thus helped to produce a more rounded understanding of a sub-process (finding) (not for all sub-processes, but definitely several).

10.4 Practical contributions (Implications)

10.4.1 Implications for language teachers

This needs analysis (NA) has implications for teachers of L2 academic listening. Among these are suggestions for developing listening pedagogy through a focus on the cognitive processes, sub-skills, and strategies involved in listening to lectures as those revealed in the present study. It also noted the difficulties that students encounter while listening to lectures. The results of the study should be particularly helpful to teachers in identifying the appropriate learning objectives for an EAP listening course. Specifically, the learning objectives can be based on cognitive processes, skills and strategies students need to effectively engage in real-life academic listening situations.

It is important that classroom teaching for academic listening emphasises the development of both lower- and higher-level cognitive processes. Teachers need to teach students sub-skills to deal with mid- and low-frequency words, formulaic expressions, and complex syntactic structures. They also need to develop an understanding of the prosodic and phonological features of speech (e.g. emphases made by speakers) and listening to multiple speakers in a single listening encounter. In addition, teachers should focus on developing students' understanding of the hierarchical nature of lectures and how to make decisions about the relevance of each piece of information contained in a lecture. Students should develop an understanding of the structure of an argument: how to identify the main ideas, key points, and supporting details and how to recognise discourse markers, the referents of pronouns, new points (as distinct from repeated ones), and ways to integrate upcoming meanings with those already processed.

The present study urges teachers to use tasks that aim to develop the process of creating intertextual representations. Listeners need to be trained to handle multi-modal input. Teachers could, for example, focus on the integration of aural input with written information in a textbook or PowerPoint presentation. They could also teach students to connect different inputs from numerous speakers in a lecture hall or to connect multiple aural texts and take efficient notes. Therefore, it is crucial that students develop an understanding of how a coherent, integrated textual

representation, which does not originate solely from the main speaker's words, is constructed.

Given the importance of listening to real-world lectures, it is also important that the teaching of listening should be based, as far as possible, on locally made materials that use real lectures relevant to the students' future study areas, in addition to commercial materials.

Students should receive instruction in the use of metacognitive and cognitive strategies. This study showed that certain listeners were unable to monitor their own comprehension and were thus unable to recognise inconsistencies in their understanding, even though what they understood was incongruent with the text's linguistic content. Other listeners were unable to monitor their attention, which tended to wander due to factors such as difficult words, redundancy, or tiredness. Students also appeared to be unaware of the demands of academic listening and its importance to their classes. They were unable to identify their listening weaknesses, including what elements to focus on in the lecture.

Although this is a context-specific study, the findings are transferrable beyond the KSU ELL setting to any situation where instructors support EFL learners in their lecture-listening comprehension. Because there are elements of the lecture setting that are not likely to be unique to the KSU setting, there may be connections with other lecture settings, such as those following a more traditional lecture format, those that use PowerPoint, and those attended by EFL or ESL students. Finally, it is recommended that EAP teachers focus on developing the processes, sub-skills, and strategies identified in this study to help prepare learners for situations that await them outside the EAP classroom.

10.4.2 Implications for test developers

Results of the cognitive processing analyses in this study suggest that test setters are advised to capture real-world lecture-listening tasks more closely, so as to increase test validity and to predict lecture-listening proficiency. In academic listening tests, the design of lecture-listening tasks should aim to assess higher-level processes, and test setters should also give more weight and higher scores to those high-level processes. More specifically, it is recommended that EAP listening tests capture a

listener's ability to gather information from several spoken ideas in a text and then organise them in a hierarchical way that corresponds to how the speaker delivered them. Further, listeners themselves must be able to assess the status of the information they hear as a part of the test (i.e. they should be able to discern key points, what details are connected to key points and what points should not be focussed on or ignored in the lecture).

Further, it has been found in this study that, in a real-world context, listeners must gather information from different modes. For this reason, it would be meaningful for a listener to be able to connect information from different listening texts on the same topic and to integrate information from them to make connections and inferences about how to understand them as a whole. It is also meaningful to use a greater number of video-based listening tasks and other materials that integrate listening with speaking, listening with reading and listening with writing. The results of this study show that students listening to lectures will encounter visual information delivered as PowerPoint slides, from textbooks, words and phrases written on whiteboards, speakers' body language, and perhaps emphases lecturers made while speaking, thus they need to be able to note and collect meaning not only from a listening mode but also from different modes that correspond with listening.

This study identified several sub-skills that are a part of the lecture-listening construct. It recommends that tests, particularly diagnostic tests, be designed to target these specific sub-skills. This is useful because, as Goh and Aryadoust (2014) mention, sub-scores based on individual items on a test listening task may provide teachers and test takers with data about test takers' strengths and weaknesses. An EAP listening training programme can enhance the sub-skills discussed in this study and could serve to meet test-takers' specific language needs.

Finally, many of the processes and sub-skills addressed in this study should be made standard features of academic listening tests tasks, particularly lectures. A next step for researchers is to explore how these processes, particularly higher-level ones, can be put into practice.

10.5 Limitations and future research

Although this study expands existing knowledge of the lecture-listening construct, it has a number of limitations. It focuses specifically on listening ability as opposed to exploring lectures as more integrated/interactive comprehension events; only the process, in the study's model, 'creating an intertextual representation', deals with the intersection of listening with other language skills. Therefore, future research should ideally focus on what processes listeners have to activate when listening is integrated with reading, writing and speaking to offer a more comprehensive picture of what real-world aural processing involves. In addition, lower-level processes are often difficult to observe and isolate—for example, much phoneme decoding while listening is automated. A deep investigation of such processes is beyond the scope of this study. This study shows those processes identified in the study's models, particularly Field's (2013), but only when such processes are mentioned explicitly by a speaker—saying 'what does this word mean?' for example—to indicate a lexical search process, or when identified by a lecturer—when they say 'I expect listeners to pay attention to when I stress some words in a lecture' for example—to indicate decoding and pragmatic inferencing processes. Thus, further NAs might carry out a deeper examination of how lower-level sub-skills are processed and assembled by the listener, such as in decoding different dialects or accents and in recognising *sandhi* variations and grammatical structures in connected speech, whether these are explicit or implicit in a speaker's words. Further, this study has generated information on processes and sub-skills. It has also examined strategies, but not in the same detail as processes and sub-skills. This does not, however, mean that strategy use is not/less central to lecture-listening; more examination of these strategies could be targeted in future research. Additionally, this study has identified several sub-processes that need to be activated and associated each sub-process with a particular (overarching) process; however, some of these sub-processes might relate to more than one process. Future research might specifically aim to explore further the relationship between intricate sub-processes and overarching processes. Further, this study has looked into the language needs of female Saudi Arabian learners listening to lectures delivered by non-native speakers of English, and the findings may not be fully generalisable to other contexts. Hence, replication studies with listeners from different language backgrounds listening to lectures delivered by native and/or non-native speakers are

recommended. Additionally, NAs often focus on providing a careful description of the frequency of occurrences of a language need, which might then highlight an important need according to the frequency of occurrence. Although I have identified how often the sub-process is encountered in this study, the reader should bear in mind that a small frequency does not imply that the sub-process is less important—for example, the title of a lecture is mentioned once during the lecture and may still be critical for the listener. Nevertheless, this study does not explain the low frequency of a sub-process and whether it is critical for the listener or less important, albeit in a significant way. For example, recognising metaphors that appear less frequently is important to the listener. While this aspect has not yet been clearly demonstrated in this study, future research could explore the frequency and importance of sub-processes in depth. Even though a sub-process could occur less frequently, it remains crucial, such as identifying the topic of a lecture; alternatively, it could also be relatively unimportant, such as recognising incomplete sentences uttered by the lecturer.

Despite being carefully designed, the study has other limitations. Stimulated recalls involved many more low- than high-ability listeners. However, if more high-ability listeners were involved in recalls, more processing problems might be revealed in this group as it is unclear whether these listeners have processing problems or not. Therefore, future research should examine more high-ability listeners' real-world processing problems. Also, despite piloting, the questionnaire design may not have been optimal. For example, one participant asked if 'understanding technical terms' involves processing already-known terms or only newly-heard ones. Others mentioned that they had never listened to a lecture from someone who spoke too fast and thus found it difficult to give their views on this. Some wondered whether the questionnaire was about what they needed to learn in a language course, especially Column A. However, I answered participants' questions at the time of administration.

Finally, the phased design of this study was labour-intensive. Therefore, I had to become well versed in many research methods. Fortunately, I have developed significantly as a researcher by doing this study.