Use of verb collocations by primary school children in science assessment tasks: a study of English native and non-native speaking children

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Use of verb collocations by primary school children in science assessment tasks: a study of English native and non-native speaking children

This paper, drawing on the findings from empirical research project conducted collaboratively by the University of Sheffield, Lancaster University and the corresponding Local Councils in five state primary schools in England, examines productive use of verb collocations in assessment tasks by English language learners (ELLs) and English native-speaking (ENS) children. Learner test data from Years 4 and 5 at key Stage 2 (8-10 year olds) in each school was analysed in order to answer the following research questions: 1) in assessment conditions, targeting elicitation of subject specific knowledge through active production of written language (Author 1 & Author 3, 2019), what verb collocations do ELLs and ENSs rely most on, and 2) to what extent does learners' use of verb collocations differ from that found in subject-specific primary dictionaries, science study books, and general corpora? The results revealed that both groups of learners produced collocations with general rather than specialised verbs most often, despite their frequent use in primary educational resources. Additionally, ELLs had difficulties with correct choice of prepositions for specific verbs and with syntactic and discourse aspects of the language, whereas ENSs did not experience these problems.

1. INTRODUCTION

The term 'English as an additional language' (EAL) is used in England to refer to people who speak English not as their first or primary language. The term EAL is largely used within educational settings, as this is where the vast majority of EAL population is concentrated. According to national educational statistics data, in 2019 the population of EAL learners has reached the mark of over 1.5 million. This number represents 21% of pupils in primary state funded schools and nearly 17% of pupils in secondary state funded schools (Department for Education, 2019).

In many respects, EAL learners are similar to their English native speaking peers. However, there are also substantial differences between backgrounds, experiences and needs of these two groups of learners. The National Association for Language Development in the Curriculum (NALDIC), the largest registered charity overseeing the needs and interests of EAL learners in England, describes EAL learners' typical profile as:

> "[learners who] share many common characteristics with pupils whose first language is English. Many of [EAL learners'] learning needs are similar to those of other children and young people learning in [England's] schools. However, these pupils also have distinct and different needs from other pupils by virtue of the fact that they are learning in and through an additional language, whilst also learning that language. In addition, they come from cultural backgrounds and communities with different understandings and expectations of education, language and learning" (NALDIC, 2019).

All these factors make school life and learning experiences of EAL learners complex and multi-dimensional.

This situation is not unique to the UK, in many educational settings in the USA, Canada, Sub-Saharan Africa, Australia and other multilingual countries, non-native speakers of the country's dominant or official language face similar challenges. In these contexts, additional language learners are known as English Language learners (ELLs) rather than EALs. The term ELL is also, and probably rather confusingly, sometimes applied to the learners who study English as a second (ESL) or a foreign (EFL) language in the contexts of their home countries as part of modern foreign languages (MFL) curriculum. These latter groups of learners, however, study their new languages as standalone subjects, which are taught as a part of their schools' curricula. Moreover, these learners naturally share the language of instruction with their teachers. Therefore, EFL and ESL learners acquire the language knowledge alone in their lessons, whereas EAL and ELL learners acquire both subject-specific knowledge (i.e. the content

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of the curriculum) and language-specific knowledge (i.e. the language of instruction) during school hours. In this paper we will use the term ELL to refer the latter group of learners.

2. LITERATURE REVIEW

2.1. LANGUAGE IN THE CURRICULUM

Studying in and through an unfamiliar language brings its challenges to all aspects of the educational process, starting from comprehending teacher's instructions (Author 4 & Author 1, 2011; Rea-Dickins, Khamis, & Olivero, 2013) and finishing with demonstrating one's own knowledge following these instructions (Brown & Spang, 2008; Duran, Dugan, & Weffer, 1998; Robinson, 2005; Swanson et al., 2014). For teachers the challenges are no smaller. Teachers have to find the ways to effectively deliver the content of the curriculum to non-native speakers of the mainstream language (Bravo, Mosqueda, Solis, & Stoddard, 2014; Lara-Alecio et al., 2012; Martin, 1993; McCloskey, 2002; Shanahan & Shea, 2012; Wallace, 2004 Rainey et al., 2015), and to reliably and fairly assess these learners' subject-specific knowledge during the teaching and learning process and at the end of it (Kopriva, 2008; Pitoniak et al., 2009; Solorzano, 2008; Author 1 & Author 3, 2019).

The role of language in the process of acquisition of subject-specific content is key. Clark (2019, p. 5) drawing on the growing body of research into language and literacy across the curriculum (Coffin & Donohue, 2014; Nesi & Gardiner, 2012; Hamphrey, 2016; Macken-Horararick et. al., 2018), states that "explicit attention to language can accelerate [learners'] development of subject literacies as part of mainstream curricular practices". Clark (2019, p.3) further states that "paying explicit attention to the linguistic patterns and structures through which subject knowledge is realised […] can be of benefit to all [learners] regardless of their linguistic backgrounds in ways that are socially just and democratic". In relation to the importance of learners' familiarity with the lexical features of language, official educational documents proclaim that: "pupils' acquisition and command of vocabulary are key to their learning and progress across the whole curriculum" (DfE 2013, p. 11). With regards to the Science curriculum specifically, the documents stress that "the quality and variety of language that pupils hear and speak are key factors in developing their scientific vocabulary and articulating scientific concepts clearly and precisely" (National Curriculum in England, 2014, p. 169).

The study of vocabulary or lexis is a broad field of enquiry. One of its strands is phraseology. Generally speaking, phraseology focuses on phrases, where phrases are "any multi-word expression up to sentence level" (Pawley 2001: 122). More restricted views regard 'phrases' or 'phraseological units' as fixed combinations of at least two words, which appear together and function as a noun, verb, adverb, or preposition (Corpas 2003: 134). From a broader perspective, other authors claim that phraseological units are all word combinations with a certain stability (i.e. collocations, compounds or idioms, would be considered as phraseological units). We follow a broad approach to the concept of phraseology and, therefore, consider 'collocations' as a type of phraseological unit. In line with semantically-based approaches to collocations (Mel'čuk et al. 1984-1999; Hausmann 1989; Howarth 1998; Benson et al. 1986, 2009) and with frequency-oriented approaches to collocations (Sinclair 1991), for us collocations can be defined as the combination of two or more words which frequently appear in combination with each other and where each lexical unit retains its meaning (Author 2, Author 5 and Author 6, 2014; Author 5 and Author 2, 2017). It seems that the native speaker linguistic competence has a large and significant phraseological component (Lewis 2000). Therefore, it is not surprising that collocational errors are among the largest category of errors made by students when learning a second language (Howarth, 1996, p. ix), prompting educational professionals recommend that ELLs should get "explicit help with understanding collocations and using them appropriately [in classroom settings]" (https://www.tts-group.co.uk/blog/2017/09/07/importance-teaching-vocabulary-eal-learners.html).

2.2. VERB COLLOCATIONS

Within the general field of phraseology, collocations can be further subdivided into seven categories (Mendoza, Mitkov and Corpas 2013: 19), namely, (i) verb + noun (direct object); (ii) noun or adjective + noun; (iii) noun + 'of' + noun; (iv) adverb + adjective; (v) verb + adverb; (vi) verb + preposition + noun; (vii) verb + noun (subject). In this study, we will focus on verb + noun collocations, where the noun works mostly as the subject. The reason is twofold. On the one hand, despite verbs are regarded as the most important lexical and syntactic category of language (Fellbaum 1990; Hanks 2008), terminological studies have mainly focused on examination of nouns and have played down the role of other grammatical categories, such as verbs (Author 2 2012; L'Homme 1998; Lorente 2007). On the other hand, research has shown that verbs pose a special learning problem for young children since verbs label dynamic events and processes (Gentner 1982, Tomasello 1992; Golinkoff & Hirsh-Pasek 2008).

In our approach to verb collocations, the collocate (the verb) is constrained by the meaning of the base, (normally the noun), but at the same time, the collocate constrains the kind of nouns that can combine with it. In contrast to meaning-based approaches which believe the base to be autonomous and the collocate to be dependent, in our approach, both elements depend on each other. For example, in the combination 'magnet repel' both 'magnet' and 'repel' maintain their respective meanings. In this sense, 'magnet' may combine with verbs conveying the meaning of either attraction or pushing away (e.g. 'repel'), and at the same time, the predicate 'repel' requires a noun or noun phrase that designate the action of forcing out (e.g. 'magnet').

The interest in phraseology, and collocations as its strand, has gained ground in recent years, especially with regards to second language learning, although most of the research has been done within the context of EFL/ESL settings with students whose levels of English language proficiency were high (Altenberg and Granger, 2001; Author 2, 2019; Laufer and Waldman, 2011; Li and Schmitt, 2010; Meunier and Granger, 2008; *inter alia)*. However, research that examines use of phraseological units in other language learning environments, such as immersion, ELL or CLIL where learners' second language proficiency may be not as high, is still gaining momentum (see Corino & Onesti 2019; Merikivi & Pietilä, 2014). Additionally, there are many more studies that focus on examinination of language use by adolescents or adults in second language learning settings than young learners (see Moje, 2015; Rainey et. al , 2015). This study, therefore, aims to address some of these gaps by investigating the use of verb collocations, as opposed to noun collocations, produced by primary school children, as opposed to adults or adolescents, who are also ELLs as opposed to ESL/EFLs.

2.3. THE LEXICAL GRAMMAR MODEL AND FRAME-BASED TERMINOLOGY

In order to be able to describe the verb collocations used by students in our research, a meaning-based classification and description of verbs were of paramount importance. Firstly, the verbs were classified in lexical domains according to the Lexical Grammar Model (LGM) (§3.1.2.1) on the premise that verbs belonging to the same lexical domain or subdomain have similar paradigmatic and syntagmatic information. Secondly, in line with Frame-based Terminology (Faber 2009, 2011, 2012) - a cognitive approach to terminology that is grounded on the premises of LGM – semantic and syntactic information about the verbs was extracted from the dictionaries and other reference material (top-down approach) and from corpora (bottom-up approach) (§4).

The LGM (Faber and Mairal 1999) divides the verb lexicon into twelve lexical domains. Each domain has one or two generic verbs or superordinates in terms of which all the members of the domain can be directly or indirectly defined. Table 1 shows the lexical domains (in square brackets) and their superordinate verbs (italics) (Faber and Mairal 1999: 88). Consequently, verbs are grouped into sets that lexicalize all or part of a conceptual domain and which share the same nuclear meaning and syntax (Faber and Mairal 1999: 59). For example, the superordinate for MOVEMENT, 'to move', marks the semantic

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territory covered by this domain and is the genus of the definition of each lexeme in the domain. The differentiae are the semantic information that distinguishes each verb from others. Subsequently, lexical domains can be further subdivided into subdomains. Each subdomain focuses on a particular area of meaning and reflects a different specification of it.

Table 1 here

In order to be able to specify the most prominent lexical domains and subdomains activated by the noun 'magnet', its verb collocations were analyzed (see section 3). According to its definition a 'magnet' is *an object that is able both to attract iron and steel objects and also push them away[1]*. As shall be seen in 3.3.3, it is not surprising that the majority of verbs collocating with 'magnet' activated the lexical domain of MOVEMENT, and within the lexical domain of MOVEMENT, two subdomains were specified, namely, *to cause to move towards something,* and *to cause to move in the opposite direction.* For example, within the subdomain of *to cause to move in the opposite direction,* the verbs 'move', 'push away', and 'repel' were retrieved; with the verb 'repel' being most specialised as it appears lowest in the hierarchy and, according to the LGM, the lower the verb is in the hierarchy the more specialized it is. A comprehensive description of the lexical domain and subdomains for 'magnet' is presented in section 3.3.3.

3. THE STUDY

The present study investigates the use of verb collocations by ELLs and ENSs in formal assessment tasks at Key Stage 2 (Years 4-5, ages 8-10) of England's National Curriculum for Science and compares patterns of learners' use of collocations with those offered by general corpora (textbooks) and dictionaries aimed at their age. The study aims to answer the following research questions:

1. In assessment conditions, targeting elicitation of subject specific knowledge through active production of written language, what verb collocations do ELLs and ENSs rely most on?
2. To what extent does learners' use of verb collocations differ from that found in subject-specific dictionaries and general course book corpora aimed at their age?

The study is a part of a larger research project (EAL-Science Project, 2013-2015 & 2018-2019) that was conducted in five state primary schools over a period of two years in Sheffield area, Yorkshire region, and over a period of one year in Preston area, Lancashire region. The schools had varying densities of ELLs, ranging from 17% to 96%, and represented children from various ethnic, social and economic backgrounds. The schools were selected on the recommendation of senior EAL consultants from the Sheffield City Council and the Lancashire County Council. The target classes in these schools were selected by the schools' head teachers on the basis of teachers' willingness to take part in the research.

3.1. PARTICIPANTS

Tha data from 257 pupils studying in Years 4 and 5 in five target schools was analysed for the purposes of this study. Table 2 provides a breakdown of learner cases by school and year group.

Table 2 here

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[1] This definition was taken from the Cambridge Dictionary Online
(https://dictionary.cambridge.org/dictionary/english/magnet)

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3.2. INSTRUMENTS AND DATA COLLECTION

In order to differentiate between ELLs and ENSs we collected data on learners' language background. In doing so we relied on learner self-reported data. To collect the language background data, we invited learners to complete a short questionnaire which was attached to the first page of their assessment booklets (see Figure 1).

Figure 1 here

Once the data was collected, we classed it into two categories according to whether English was perceived to be learners' first language or not. These were:

1) *'English Native Speaker'* – this included all cases where learners self-reported speaking English as their first language AND named no other language/s as being spoken at home;

2) '*English Language Learner'* – this included all cases where learners self-reported speaking English as their second or third language by either stating this explicitly and/or by naming one or more 'other' languages as those that are being spoken at home.

The final database resulted in the following distribution of learner cases by the 'language background' variable (Table 3).

Table 3 here

In order to analyse learners' use of language (verb collocations) in Science we invited them to complete several assessment tasks. The assessment tasks were taken from the 2003–2011 National Curriculum assessment papers (Qualifications and Curriculum Authority, 2003–2011). The criteria for the tasks' selection were that (1) the focus of the assessment tasks had to be on the topic of magnets - a key topic area of the national curriculum for science at KS2, and (2) the assessment tasks had to require active production of written language on the side of the learners. Within the range of thirty-two assessment tasks used in the project, four questions were dedicated to the subject of magnets, but only two had satisfied the second selection criterion. These questions are detailed in Figures 2 and 3.

Figure 2 here

Figure 3 here

By active language production we understand "the creation of spontaneous responses [oral or written] and appropriate meaning making [by learners] in learning tasks and assessment questions" (Author1 & Author 3, 2019, p. 6) as opposed to their "passive reproduction of language [which is often realised by means of mere] incorporation or transferring of provided linguistic models into responses" (p. 7). The following types of assessment tasks belong to the active language production group: 1) "Name", 2) "Explain", 3) "Name and Explain", and 4) "Describe (see Author 1 & Author 3 (2019) for comprehensive definitions of these types of assessment tasks and their specific examples). These two examples of the assessment tasks are clustered under the "explain" category of the active language production group as they both require learners to explain the phenomenon drawing on their own, authentically/spontaneously produced, linguistic resources.

The cases where learners have not attempted answering the questions or where interpretation of their written performance was problematic due to illegible spelling, were excluded from the analysis. Tables 4 and 5 provide a breakdown of learner responses to the two assessment tasks (Question 1 "Explain why the train engine moves away from the bar magnet" and Question 2 "Explain why magnet A moves with magnet B" respectively) by learner language background.

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Table 4 here

Table 5 here

Once eligible language data on verb collocations was extracted from learner written responses to the target assessment tasks, it was compiled into the learner corpus. Each learner's answer was made up of one or two sentences, resulting in a rather small overall corpus of learners' responses. Despite being small in terms of the number of words, this corpus remains representative of the common limited use of written language by learners in non-linguistic disciplines at primary phase of education in England.

4. METHOD

In line with Frame-based Terminology (Faber 2009, 2011, 2012) (section 2.3) the methodology used to specify the verb collocations of the subdomain of magnets within the general domain of science was done by means of an integrated *top-down* and *bottom-up* approaches. The top-down approach includes the information provided by school primary science dictionaries and other reference materials such as science textbooks and revision guides for Key Stage 2. The bottom-up approach consists of extracting the collocational information from a corpus, and we used a general English corpus to this end.

4.1. TOP-DOWN APPROACH

Tarp (2011: 226) states that "a school dictionary is a learner's dictionary (or pedagogical dictionary) especially designed to assist school children in learning languages (whether a native or a foreign language) and scientific and practical disciplines". Therefore, school dictionaries become especially useful for ELLs since these learners need to acquire both specialized content of the discipline and language at the same time (School Curriculum and Assessment Authority (SCAA), 1996; Qualifications and Curriculum Authority (QCA), 2000; Times Educational Supplement (TES), 2005). There are many discipline specific dictionaries aimed at primary school children in published in English language. Entries from them, focusing exclusively on linguistic representations of the properties of magnets, are summarized in Table 6. Words highlighted in bold in the table represent verb collocations used with the noun 'magnet' in the dictionary entries (our emphasis).

Table 6 here

It is evident from this table that the verbs 'attract (to) (each other)', 'repel' (each other), 'push (each other) away', and 'pull towards' are repeatedly used in all resources to convey the meaning of MOVEMENT. Whereas the verb collocation 'exert' is used within the domain of ACTION to convey the meaning of ACTION; for example, 'a magnet exerts a magnetic force'.

Similar to school dictionaries, study books, textbooks and revision guides that support national curricular are also popular sources for obtaining linguistic and subject-specific information for learners. Table 7 shows the extract from the section devoted to the concept of magnets in the "*Key Stage Two Science: The Important Bits*" (Gannon, 1999). As in the previous table, the words highlighted in bold in this table represent verb collocations used with the noun 'magnet' in the book (our emphasis).

Table 7 here

The table shows that verb collocations 'attract' (for example, *only metals are attracted to magnets, a North pole and a South pole will attract each other),* and 'repel' (for example, *two North poles will repel*

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each other) are used in the examined book within the meaning dimension of MOVEMENT, and the verb collocation 'put a force' is used in the examined book within the meaning of ACTION.

4.2. BOTTOM-UP APPROACH

The bottom-up approach draws on corpus. To this end, we used one general English corpus available on the corpus query system Sketch Engine[2] (designed by Kilgarriff et al. (2004). Sketch Engine allows the user to extract collocational information from a corpus due to its feature *word sketch*. Word sketches are one-page automatic, corpus-based summaries of a word's grammatical and collocational behaviour. More specifically, we used the corpus referred to as EnglishWeb2015 composed of 15 billion words. Even though the English corpus used was not a specialized science corpus, it was appropriate to use it for the purposes of this study as subject specific terminology within science discipline at primary level is largely projected into general language.

 The key word in our search was 'magnet'. When it was queried by means of the Word Sketch function, the system retrieved all the collocations which combine with 'magnet' extracted from the corpus and classified the collocations according to the part of speech, i.e. adjective collocations, noun + noun collocations, verb collocations, etc. Figure 2 shows the verb collocations offered by Sketch Engine when 'magnet' works as a subject[3]. The words on the left-hand side of the table are verbs, followed by their frequency in the corpus, and their typicality score (LogDice) which indicates how strong the collocation is - the higher the score the stronger the collocation. The dots on the right-hand side allow users to access the concordances for each verb.

 Of all the verb collocations for 'magnet' offered by Sketch Engine (see Figure 4), those activating the meaning of MOVEMENT are the ones of interest to this study; they are: 'repel', 'attract', 'stick', 'pull', and 'attach'. In this list, the verb 'attract' is one of the most salient collocation, with a LogDice score of 6.19, appearing a total of 435 times in the corpus. Figure 4 displays the list of concordances with the verb 'attract'. Concordance lines help users to understand how to use collocations in context. In this sense, concordance lines cited in the Figure 5 show that the verb 'attract' normally combines with a noun (e.g., 'steel', 'metal') or with a pronoun (e.g., 'each other').

Figure 4 here

Figure 5 here

4.3. SUMMARY OF THE VERB-COLLOCATIONS ACTIVATED BY 'MAGNET'

Table 8 gathers all verb collocations with the noun 'magnet' extracted by means of both top-down and bottom-up approaches described in sections 4.1 and 4.2.

Table 8 here

 For further analysis, only verb collocations involving verbs activating the underlying meaning of MOVEMENT were selected. The rationale for this was twofold. Firstly, the lexical domain of MOVEMENT is the prominent lexical domain activated by the concept of 'magnet'. Secondly, the questions learners had to answer in the science test (section 3) referred to the movement properties of a

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[2] https://www.sketchengine.eu

[3] Sketch Engine also includes the collocations when 'magnet' is used as an object. However, since they are very similar and for space constraints, only verbs used when 'magnet' works as a subject were included.

'magnet'. All verb collocations within the lexical domain of MOVEMENT are listed under the 'meaning of MOVEMENT' section in the Table 8. The definitions of these verbs were then subjected to an analysis to establish their subdomains within the larger domain of MOVEMENT on the premises of the Lexical Grammar Model. Two subdomains, within the general domain of MOVEMENT, were identified - 'to cause to move towards something' and 'to cause to move in the opposite direction' (see Table 9).

Table 9 here

Table 9 reveals that all target verbs (namely: 'pull', 'attach', 'stick', 'attract', 'push' and 'repel') have *a genus* that directly or indirectly corresponds to the superordinate in the hierarchy ('move'), and *a differentiae* that distinguishes more general verbs (which are presented at the top of the hierarchy, i.e. 'pull') from more specialized verbs (which are presented at the bottom of the hierarchy, i.e. 'attract'). In the following section we analyse and describe the ELLs' and ENSs' use of verb collocations for the noun 'magnet' and contrast them against the range of corresponding verb collocations identified in subject-specific dictionaries, textbooks, and general corpus described above.

5. ANALYSIS

We noted in Section 3 that only instances of eligible language data on verb collocations from written learner responses to the target assessment tasks were extracted from the raw data for the purposes of this study's analysis (see Tables 4 and 5). We analysed this data firstly, by the assessment task (see Section 3.2), and then, within each assessment task, by learner language background group (see Section 3.2). When presenting learner data in the analysis tables and in Appendix, we used the following conventions. Combined learner nuclear verb data was highlighted in bold and presented in descending order of frequency (see two foremost left columns in Tables 10, 11, 12, 13). When learners used the same nuclear verb which activated the same nuclear meaning, but did so with different prepositions, all verbal variants of the target nuclear verb were included in a different column of a table with the exact number of occurrences of each variant (see two foremost right columns in Tables 10, 11). All instances where verbs were misspelt or used incorrectly in terms of syntax were included into analysis and were cited in the tables in their original form followed by an asterisk (*). Authentic examples of learner language data, taken directly from the learners' corpus of responses, were included into the foremost right column of Tables 14a and 14b in Appendix. Where the responses were linguistically incorrect, original spelling, syntax and punctuation were maintained and an asterisk was used to mark this. Finally, due to the purpose of this study being purely linguistic, we did not assess learners' responses for subject-specific correctness (that is, knowledge of scientific facts), but used them exclusively to extract learner linguistic data on the use of verbal collocations in their spontaneous writing.

5.1. Use of verb collocations by ELLs and ENSs in the first assessment task

Table 10 details range and frequency of verb collocations with the noun 'magnet' produced by 126 ELLs in the first assessment task (69.6% of the entire ELL cohort for this question, see Table 10). The table shows that the verb 'be' is the most frequently used verb with 53 instances (30%) of occurrence in the data, followed closely by the verb 'move' with 25 instances of occurrence (14%); with 'move away' being the most common verb variant for the nuclear verb 'move'. It is interesting to note that the words 'move away' were included in the wording of the assessment task's instruction and, therefore, could have been used by some of the learners as a scaffolding tool to help them formulate their own linguistic responses to this assessment task; same assumption is true for the ENSs' cohort as will be evident from further analysis. The third most frequently used verb in by the ELLs was 'stick' (19 instances of occurrence, 11%). It was used either intransitively ('stick') or along with the prepositions 'stick to', 'stick together' and 'stick on*'. From linguistic point of view, 'stick to', and 'stick together' do collocate, but 'stick on*'

does not collocate, as is confirmed by the dictionary entry for this verb in the Cambridge Dictionary Online (Figure 6).

Figure 6 here

Table 10 here   **Table 11 here**

Subsequently, the verb 'touch' was utilized 9 times (5%), followed by the verbs 'push', 'have', 'connect' and 'face' (4.5%, 4%, 3.5% and 3.5% of occurrences respectively). Similarly to the verb 'stick', the verb 'connect' can either be transitive in nature - 'connect something', or intransitive - 'connect to', but it is not idiomatically correct to use this verb with the preposition 'with' ('connect with') as was instantiated by one ELL. Out of 126 ELLs, only 5 used the specialized verbs 'attract' (3% of cases in the verb collocation database) and 5 'repel' (futher 3% of cases). Additionally, these words were often misspelt by the learners ('atract*', 'reepel*', 'repl*', 'repeling*'), contained syntactic errors (e.g. 'attract to*', 'attract' is a transitive verb and, thus, needs to be followed by an object) or discourse errors ('repel' was used out of context). The rest of the verbs used by ELLs in the first assessment task were 'go' in the sense of move (4 occurrences, 2.5%); e.g. *the engine is going because Nishas magnet is north instead of south*), 'make' (4 occurrences, 2.5%), 'go together' in the sense of being together, and 'pull' (3 occurrences each, 2% each); 'match', and 'point' (2 occurrences each, 1% each); and 'attach', 'come together', 'keep', 'meet', 'turn', and 'work together' with one instance of occurrence (0.5%) each.

Table 11 details range and frequency of verb collocations with the noun 'magnet' produced by 55 ENSs in the first assessment task (72.4% of the entire ENS cohort for this question; see Table 11). The table shows results similar to those for ELLs. Namely, the verb 'be' is the most frequently used verb with 24 instances of occurrence in the data (44%), followed closely by the verbs 'move', 'touch', 'stick' and 'push' (18%; 13%, 9% and 9% of occurrences respectively). The verbs 'connect', 'face', 'attract', 'put', 'repel' and 'go [move]' occurred 3 times each in the data (5%); with the verbs 'attract' and 'repel' constituting 10% of the total 'magnet properties related lexis' elicited from eligible ENSs responses to the first assessment task. This number is nearly twice as high as that for ELLs (6%) for the same type of data, however analysis of learner responses to the second assessment task presented in the following section, will reveal that both groups of learners were in fact equally likely to use highly technical lexis in their spontaneous written language production (10% of the time for ELLs and 10% of the time for ENSs, see Tables 12 and 13). A noticeable difference between the two groups becomes apparent, however, when we look at learners' use of prepositions within the target sets of verb collocations. The data shows that ENSs did not experience difficulties in choosing correct prepositions for specific verbs, whereas ELLs did have this difficulty for a number of verbs, namely, 'stick', 'connect', 'attract' (see Table 14b in the appendix for specific examples of learners' use of language in context). The remaining, least frequently used, verbs by ENSs were 'have' with 2 instances of occurrence (4%), 'join', 'pull', 'go together', 'match', 'bind' and 'meet', with 1 instance of occurrence (2%) each. ENSs were also found having frequent difficulties spelling the verbs 'attract' and 'repel', and occasional difficulties spelling the verbs 'stick', 'touch' and 'connect'.

5.2. Use of verb collocations by ELLs and ENSs in the second assessment task

Findings for the first assessment task are further reinforced by the findings for the second assessment task for both groups of learners. Data presented in the Tables 12 and 13 reveals that the verb 'be' yet again was the most commonly used verb for explaining properties of a magnet by learners in the second assessment task (31% of cases for ELLs and 33% for ENSs; compared to 30% for ELLs and 44% for ENSs in the first assessment task).

Table 12 here   **Table 13 here**

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Furthermore, learners' most frequent usage of the verb 'be' was consistently closely followed by the verbs 'move', 'stick', 'attract' and 'connect' (15%, 14%, 10% and 6% of occurrence for ELLs and 13%, 14%, 10% and 9% of occurrence for ENSs), with both groups of learners using highly technical lexical item 'attract' equally often (10% of the time). As with the data for the first assessment task, learners from both groups found spelling of the verb 'attract' problematic; however, overall ELLs' experienced much more and wider ranging difficulties with spelling of other verbs. They found spelling of the following verbs particularly problematic 'stick', 'attract', 'connect' and 'attach'. Finally, in line with the data reported for the first assessment task, in second assessment task ELLs were found struggling with correct usage of prepositions collocating with the verbs 'attract' (attract with*; attract together*), 'stick' (stick on*), 'attach' (attach together*) and 'pull' (pull at*) whereas ENSs did not experience this difficulty.

6. DISCUSSION

What can be deduced from the above analyses (sections 6.1 and 6.2) is that both ELLs and ENSs tended to rely heavily on the use of general verbs (such as, 'be', 'move') and semi-general verbs (such as, 'stick', 'touch', 'connect') to describe more specialized processes. The specialized verbs 'attract' and 'repel', highlighted in the dictionaries and textbooks aimed at primary school learners, and in a general English corpus were used infrequently (6-10% depending on the assessment task and learner group) and were often misspelt by learners in both groups; as were, occasionally, the verbs 'stick', 'touch' and 'connect'. Wider range of verbs was also misspelt by ELLs only. Furthermore, it were ELLs alone who had additional difficulties with correct choice of prepositions for specific verbs and with syntactic and discourse aspects of the language. The finding on all learners' usage of the verbs 'attract' and 'repel' resonates closely with the word usage hierarchy specified in the lexical domain for the concept of 'magnet', whereby more general verbs that are placed higher in the hierarchy and used more often than specialised verbs placed further down in the hierarchy. However, despite specialised / technical words 'attract' and 'repel' were listed in all science dictionaries, general corpus and study/revision textbooks for primary science analysed by us, they are not obligatory for usage by learners at primary stage of education in England; apart from cases where learners' knowledge of scientific terminology is specifically targeted and requires assessment. Indeed, our limited data on teacher discourse practice in primary education instructional settings on the topic of magnets provides examples of teacher frequent usage of language describing properties of magnets drawing on general and semi-general lexis, such as 'move (away)', 'stick (to)', 'touch (something)', 'put (together)', 'pull (off/towards/together)' and occasional usage of highly-specialised lexis, such as 'attract'. Furthermore, Figure 7, which presents an extract from the standard attainment tests (SATs) marking scheme guide (for assessment tasks 1 and 2 used in this study), also shows that learners are allowed to freely use general, semi-general and technical terms when demonstrating their knowledge of scientific processes and facts in assessment conditions.

Having freedom in the choice of lexis however does not seem to have mitigated learners' struggles with correct spelling of technical and semi-technical words. Our data revealed that many ELLs and ENSs had difficulties in this area. Moreover, our data also showed that ELLs specifically struggled with mastering syntactic and discourse-related features of language. These findings suggest that primary school learners might need additional guidance and support from their teachers with using technical and semi-technical lexis more effectively in their active (i.e. spontaneous) language production. Author1, drawing on a larger language database from the very same research, found out that learners' difficulties related to recognition and understanding and use (Author1 & Author 3, 2019) of technical terms in primary science classrooms, such as 'absorb', 'condense', 'evaporate', 'grow', 'reproduce', 'separate', was a common problem for all groups of learners (ELLs and ENSs) in all year groups at Key Stage 2.

Figure 7 here

If not addressed during early stages of educational process, this issue might grow into a critical problem at secondary education phase when learners' ability to spontaneously produce scientific discourse "using precise scientific language" becomes compulsory (Department for Education and Skills, 2002, p. 9). Teaching accurate and promoting fluent use of subject-specific language, including verbal collocations, through explicit attention to language (Freeman & Freeman, 2008; Moje, 2015; Rainey et. al, 2015; Tong et. al, 2010) and ample opportunities for practice (Wolf & Farnsworth, 2014) should become one of the key priorities for educational professionals working with students in compulsory phases of education.

7. LIMITATIONS

Our study has several potential limitations. Firstly, it analysed language performance of relatively small group of learners in a linguistically restricted setting (verb collocations with one noun only) preventing us from testing its results for statistical significance and imposing restrictions on the extent to which our findings could be generalised to wider groups of population. Secondly, the assessment questions themselves might have not elicited as rich samples of learner language data as well as they could have done should the questions been formulated differently. Analysing learner performance on wider range of assessment tasks within the same topic could have further assisted insightful interpretation of learner linguistic behaviour. Finally, analysing language performance of older learners, i.e. those studying at secondary education phase, would have allowed us to elicit richer samples of data that could be contrasted against samples of learner data collected for this study (i.e. those for primary educational phase), possibly resulting in more profound understanding of the issues investigated in this paper. This is the next stage on our research agenda.

8. CONCLUSION

The interest in the study of phraseology has dramatically grown in recent years, especially with regards to second language learning. However, as outlined throughout this research, most studies in the field focused on the context of EFL/ESL, on students who already had advanced language skills and who were either adults or adolescents. However, phraseological studies that focus on ELLs and, more specifically, on younger children are virtually non-existent given the difficulty in accessing actual material produced by children. This study is one of the few that were conducted in the immersion ELL context, with children aged between 8-10 years, and that also allowed for a comparison between native and non-native pupils. By utilizing of top-down and bottom-up approaches, based on the premises of FBT and LGM, that were proven to be effective in other sub-domains of science such as the environment, we were able to conclude that in specialized contexts such as science classrooms, young learners mostly use general language - verbs such as 'move', 'touch', 'go or 'be' - to describe properties of magnets. Only a very small proportion of learners used specialized verbs, such as 'repel' and 'attract' that appear in general language corpora, in science dictionaries and textbooks for their age. Moreover, this linguistic behavior was evident in both groups of learners, ELLs and ENSs. However, a big difference between the groups lied in the fact that while ENSs always produced syntactically correct sentences, ELLs experienced some problems with the correct use of prepositions. Drawing on these findings, we recommend that teachers' instructional behavior in subject-specific classrooms should accentuate and promote the use of specialized language by learners from an early age, so that their academic and discipline-specific language competences start developing and maturing early on.

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APPENDIX

Table 14(a) here

Table 14(b) here

Table 1. Lexical domain in the LGM (Faber and Mairal 1999: 88)

(i) *to be* [EXISTENCE]
(ii) *to become different* [CHANGE]
(iii) *to have/give* [POSSESSION]
(iv) *to say* [SPEECH]
(v) *to feel* [EMOTION]
(vi) *to do/make* [ACTION]
(vii) *to use* [MANIPULATION]
(viii) *to know/think* [COGNITION/MENTAL PERCEPTION]
(ix) *to move (go/come)* [MOVEMENT]
(x) *to become aware (notice/perceive)* [GENERAL PERCEPTION]
(xi) *to see/hear/taste/smell/touch* [SENSE PERCEPTION]
(xii) *to be/stav/put* [POSITION]

Table 2. Distribution of learner cases by school and year group

	Schools				
Year Group	**School 1**	**School 2**	**School 3**	**School 4**	**School 5**
Year 4	27	26	20	27	32
Year 5	26	28	26	20	25

Figure 1: Learner language background and self-assessment questionnaire

Table 3: Distribution of learner cases by 'language background' variable

Language background	No. of students	Percentage
ENSs	76	30%
ELLs	181	70%
Total	257	100%

1

Figure 2: Question 1 - Explain why the train engine moves away from the bar magnet

Nisha moves a different bar magnet towards the magnet on the engine. The magnets do not touch each other.

The engine moves away from Nisha's magnet.

direction engine moves

direction magnet moves

| S | N |

Engine

Nisha's magnet

Explain why the train engine moves away from the bar magnet.

....

....

Figure 3: Question 2 - Explain why magnet A moves with magnet B

Neil uses two magnets to clean **algae** (small green plants) off the sides of the tank.

He puts magnet B on the outside and magnet A on the inside.

magnet A

algae

Neil moves magnet B on the outside of the tank.

magnet B

As he moves magnet B, magnet A moves with it.

Magnet A scrapes away the algae inside the tank.

Explain why magnet A moves with magnet B.

....

Table 4: Distribution of learner responses to the first assessment task by learner language background

Response to the assessment task	ELLs		ENSs		Total	
	No	%	No	%	No	%
YES and eligible[1] response is provided	126	69.6	55	72.4	181	70.4
NO / YES but illegible response is provided	55	30.4	21	27.6	76	29.6
Total	181	100	76	100	257	100

---

[1] 'Eligible' response to the assessment task does not necessarily mean the 'correct' response. For the purposes of this paper it was not important to us whether the response was correct or not, what was important, was the use of language that the learners produced as part of their response.

2

Table 5: Distribution of learner responses to the second assessment task by learner language background

Response to the assessment task	ELLs		ENSs		Total	
	No	**%**	**No**	**%**	**No**	**%**
YES and eligible response is provided	137	75.7	65	85.5	202	78.6
NO / YES but illegible response is provided	44	24.3	11	14.5	55	21.4
Total	181	100	76	100	257	100

Table 6. Linguistic representations of the properties of magnets in school science dictionaries

School science dictionary	Linguistic representations of the properties of magnets
Scholastic (Berger 2000)	Magnet: an object that **attracts** iron, steel, cobalt, and certain ceramics. Magnetic pole: either the north or south pole of a magnet, where magentism is strongest. Opposite poles **attract** each other; like poles **repel** or **push** each other **away.**
Oxford Primary Illustrated Science Dictionary (2013)	Magnet: a magnet is a piece of iron or steel that **exerts** a magnetic force. Magnetic pole: all magnets have a north and a south pole. A north pole and a south pole **attract** each other. Two north poles or two south poles, **repel** each other.
Oxford First Illustrated Science Dictionary (2013)	Magnet: magnets **attract** iron and steel. Two magnets can **attract** or **repel** each other. Like poles **repel**, unlike poles **attract.**
Usborne first illustrated science dictionary (Khan 2013)	Magnetic: magnetic materials are **pulled towards** magnets by a force called magnetism. All magnets and some metals, such as iron and nickel, are magnetic. Poles: the end of magnets are called poles. When one thing is **pulled towards** another, it is being **attracted** to it. Magnetic poles of different types always **attract** each other. When one thing is **pushed away** from another, it is being **repelled** by it. Magnetic poles of the same type always **repel** each other.
Junior Illustrated SCIENCE Dictionary (Khan and Gillespie 2012)	Magnets: a magnet **attracts** some types of metal **towards** it by a force called magnetism. It also **attracts** other magnets. The metal iron, nickel and cobalt can all be made into magnets. Poles: the ends of magnets are called poles and magnetic forces are strongest here. One end is called the North pole; the other is the South pole. Attraction and repulsion: a magnet's North pole will always **pull towards** another magnet's Soutch pole. This is described as magnetic attraction. Two poles of the same type always **push** each other **away**. This is described as magnetic repulsion. Magnetic materials: a magnetic material is one that is **attracted to** a magnet. It can only be attracted to a magnet -never **repelled** by one.

Table 7. Linguistic representations of the properties of magnets in science study/revision book

KEY STAGE TWO SCIENCE: THE IMPORTANT BITS
Magnets 1) Only metals are **attracted** to magnets […] 2) Some magnets are stronger than others […] 3) Not all metals are **attracted** to magnets […] 4) Magnets **put** a force on other magnets or magnetic materials -A north and a south pole will **attract** each other (magnets move towards each other) -Two north poles will **repel** each other (magnets move away from each other) -Two south poles will **repel** each other (magnets move away from each other) Feel attractive: you must be a magnet Magnetism is a bit weird when you think about it -a magnet can pick up paperclips without even touching them… Remember, metals can be magnetic, but not all metal are magnetic. You need to get the difference between being magnetic and actually being a magnet straight in your mind. Think about two magnets **repelling** each other -only magnets can do that.

3

Figure 4. Extract of verb collocations with 'magnet' in Sketch Engine

Figure 5. Extract of concordances with 'magnet' and 'attract' in Sketch Engine

Table 8. Verb collocations with 'magnet'

	VERB COLLOCATIONS EXTRACTED	
SOURCE	**meaning of MOVEMENT**	**other meaning**
School science dictionaries	'attract (to) (each other)', 'repel' (each other), 'push (each other) away', 'pull towards'	'exert (force)'
Study / revision books	'attract', 'repel'	'put (force)'

4

General corpus	'repel', 'attract', 'stick', 'pull', 'attach'	'exert', 'quench', coil', 'activate', 'vibrate'. 'rotate', 'levitate'

Table 9. Lexical subdomains of MOVEMENT activated by 'magnet'

MOVEMENT move
to cause to move towards something
pull towards: to cause to move towards something
attach: to pull towards something and be held there
stick to: to attach to something
attract: to stick to something (especially referred to a magnet)
to cause to move in the opposite direction
push away: to move forcefully, especially in order to cause someone or something that is in your way to move, so that you can go through or past them
repel: to push away something with a similar magnetic field

Figure 6. Definition of the verb 'stick' with examples in the Cambridge Dictionary Online

> **stick:** to cause something to become fixed, for example with glue or another similar substance.
> *I tried to **stick** the pieces **together** with some glue/tape.*
> *He stuck up an announcement on the board with pins.*
> *This glue won't **stick.***
> *My car's **stuck** in the mud.*
> *Stir the sauce so that it doesn't **stick to** the pan.*
> *My book got wet and all the pages have **stuck together**.*

Table 10: Range and frequency of verb collocations with the noun 'magnet' used by ELLs in the first assessment task

Verb	Frequency N	%	Verb variants	
be	53	30		
move	25	14	move	6
			move with	2
			move away	15
			move to/towards	2
stick	19	11	stick	6
			stik*	3
			stick on*	1
			stick to	4
			stick together	5
touch	9	5	touch	8
			tuch*	1
push	8	4.5	push	3
			push away	5
have	7	4		
connect	6	3.5	conect* with*	1
			connect to	2
			connect	3
face	6	3.5		
attract	5	3	atract*	1

Table 11: Range and frequency of verb collocations with the noun 'magnet' used by ENSs in the first assessment task

Verb	Frequency N	%	Verb variants	
be	24	44		
move	10	18	move	3
			move away	7
touch	7	13	touch	6
			toch*	1
stick	5	9	stick	2
			stik*	1
			stick together	2
push	5	9	push	1
			push away	4
connect	3	5	conect*	1
			conect* to	2
face	3	5		
attract	3	5	atract*	1
			attract to	1
			attrak*	1
put	3	5		
repel	3	5	repals*	1
			repel	1
			repell*	1

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Verb	N	%	Verb variants	
			attract to*	1
			attract (sth)	3
join	5	3	join	3
			join together	2
put	5	3		
repel	5	3	reepel*	1
			repl*	1
			repeling*	2
			repelling	1
go [move]	4	2.5		
make	4	2.5	made of	2
			made out of	1
			made from	1
go together [be]	3	2		
pull	3	2		
match	2	1		
point	2	1		
attach	1	0.5		
come together	1	0.5		
keep	1	0.5		
meet	1	0.5		
turn	1	0.5		
work together	1	0.5		
TOTAL	177	100		

Verb	N	%	Verb variants	
go [move]	3	5	go	2
			go forward	1
have	2	4		
join	1	2		
pull	1	2		
go together	1	2		
match	1	2		
bind	1	2		
meet	1	2		
TOTAL	77	100		

Stik* - misspelt lexical item
With* – misuse of preposition

Table 12: Range and frequency of verb collocations with the noun 'magnet' <u>used by ELLs</u> in the second assessment task

Table 13: Range and frequency of verb collocations with the noun 'magnet' <u>used by ENSs</u> in the second assessment task

Verb	Frequency N	%	Verb variants	
be	48	31		
move	23	15	move with	9
			move	7
			move away	1
			move together	6
stick	22	14	stick	5
			stick on*	3
			stuk* on*	
			stick through	1
			stick to	2
			stick together	11
attract	15	10	atrack*	1
			atract*	3
			attrack	1
			attract	3
			attract with*	2
			attract together*	2
			attract to	3
connect	9	6	connect	7
			conect*	2
go [move]	6	4	go	3
			go through	3
attach	5	3	attach (to)	2
			attach together*	2
			atach*	1
join	4	2.5	join	2
			join together	2
touch	4	2.5		

Verb	Frequency N	%	Verb variants	
be	23	33		
stick	10	14	stick	2
			stick through	1
			stick to	1
			stick together	6
move	9	13	move with	4
			move	3
			move together	2
attract	7	10	atrack*	1
			atract*	2
			attract	2
			attract to	2
connect	6	9	connect	4
			conect*	2
touch	3	4		
attach	2	3	attach (to)	2
join	2	3	join together	2
pull	2	3		
go [move]	1	1		
have	1	1		
slide	1	1		
face	1	1		
stay	1	1		
make	1	1		
TOTAL	70	100		

Atrack* - misspelt lexical item
On* – misuse of preposition

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pull	4	2.5	pull	3
			pull at* (each other)	1
have	3	2		
put	3	2		
make (out of)	2	1		
hold (on to)	1	0.5		
split apart	1	0.5		
catch	1	0.5		
meet	1	0.5		
take	1	0.5		
react	1	0.5		
interact	1	0.5		
push	1	0.5		
Go together [be found]	1	0.5		
TOTAL	157	100		

Figure 7: Standard attainment tests' marking scheme guide (excerpts)

Question 1: Explain why the train engine moves away from the bar magnet

Mark	Requirements	Allowable answers	Additional guidance
1m	Award **ONE** mark for an indication that the magnets **repel** each other **or** that the magnets have like poles facing each other: ■ the magnets are repelling each other ■ Nisha's magnet is pushing the train's magnet away ■ like poles repel ■ the two North poles on both magnets are facing each other.	**ONE** mark may be awarded for: ■ the magnetic force pushes it away ■ Nisha put like poles together ■ it is repelling. **ONE** mark may be awarded where an insufficient or no response is given but the left-hand pole of Nisha's magnet has been correctly labelled 'N'.	**Do not** give credit for an insufficient response: ■ the magnet pushes it ■ Nisha's magnet is not the right way round ■ the magnets do not attract [does not imply repulsion]. **Do not** give credit for an insufficient response implying the whole magnet is one pole: ■ they are both North magnets so they will repel.

Question 2: Explain why magnet A moves with magnet B

Mark	Requirements	Allowable answers	Additional guidance
1m	Award **ONE** mark for an indication that there are forces of attraction between the magnets **or** that the magnets have opposite poles facing each other: ■ the magnets are attracted to each other ■ because opposite poles attract ■ the North pole of one magnet is facing the South pole of the other magnet.	**ONE** mark may be awarded for: ■ the magnets stick/stay together ■ magnet B pulls magnet A with it. **ONE** mark may be awarded for a response indicating the magnetic force extends through the glass/tank: ■ the force works through the tank.	**Do not** give credit for an insufficient response that does not make explicit that the magnets attract: ■ there is a force between the magnets ■ it moves because they are magnetic ■ they connect together. **Do not** give credit for an insufficient response implying each magnet is a different pole: ■ they are opposite poles ■ magnet B is South and magnet A is North.

Table 14(a): Range, frequency and examples of verb collocations with the noun 'magnet' used by ELLs in the first assessment task ("Explain why the train engine moves away from the bar magnet")

Verb	Times used	Verb variants		Students' examples
be	53			*"because the s and s are together"* *"because it has to be north"* *"because north and south is not in the right place"* *"because north cant be next to north"* *"it has to be north and north or south and south"*
move	25	move	6	*"the reason the train moves is that north is against north"*

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		move with	2	*"magnet A moves with magnet B because the N and S are facing each other"*
		move away	15	*"it moves away because they push away when the two are connected like north and north"*
		move to/ towards	2	*"because N dose* not move towards N it dose* move to S"*
stick	19	stick	6	*"the train moved away from the bar magnets because if two north sides of the magnet face each other they wont stick"*
		stik*	3	*"because it is north but if you change it the other way then it will stik*"*
		stick on	1	*"the train moves away from the magnet because it dont* stick on*"*
		stick to	4	*"because north can't stick to north but north can stick to south tough*"*
		stick together	5	*"becaus* N and N do not stick to* gether"*
touch	9	touch	8	*"because N and N must not touch each other"*
		tuch*	1	*"because Nishas magnet is pointin* to the north side of the magnet and two magnets cant tuch* each other"*
push	8	push	3	*"because north vs north one will push the other"*
		push away	5	*"it moves away because they push away when the two are connected like north and north"*
have	7			*"because she has the magnets the wrong way round"*
connect	6	conect* with*	1	*"because north dosent* conect* with north"*
		connect to	2	*"it could be because the train engine is not connected to something"*
		connect	3	*"the north is connecting another north"*
face	6			*"because the negative sides are facing each other"* *"because north is facing the same north"*
attract	5	atract*	1	*"Nisha put the north part of the magnet againts* the other north part of the magnet so they dont atract*"*
		attract to*	1	*"N dosent* atract* to N"*
		attract (sth)	3	*"because it is north and north and south and south and both dont attract each other"*
join	5	join	3	*"it is the wrong type of magnet so it is not joining"*
		join together	2	*"becase N and N dont join together"*
put	5			*"they haven't put he magnet the right way"* *"because she put it the wrong way"*
repel	5	reepel*	1	*"reepel"*
		repl*	1	*"repl*"*
		repeling*	2	*"because n and n dont come together it's repeling*"*
		repelling	1	*"it is repelling the magnet because it is not on the correct pole"*
go [move]	4			*"the engine is going because Nishas magnet is north instead of south"*
make	4	made of	2	*"because the engine was made of plastic"*
		made out of	1	*"because the magnets where* made out of diffren* tayps* matarials*"*
		made from	1	*"because the engine was not made from magnet"*
go together [be]	3			*"a negative side and a negative side don't go together"*
pull	3			*"the magnet is pushing it no pulling it"*
match	2			*"it has moved because the magnets ends (N and S) havent matched"*
point	2			*"Nisha's pointing the north side of the magnet to the north side of the other magnet"*
attach	1			*"becaus* if Nisha put it the wrong way because the same couleur* does not attach"*
come together	1			*"because n and n dont come together it's repeling*"*
keep	1			*"because Nisha keep* the magnet still and the train is moving so the train moved away"*

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meet	1			*"it happens because the north and the north will never ever meet"*
turn	1			*"because she turned the wrong magnet"*
work together	1			*"north and north do not work together"*

Table 14(b): Range, frequency <u>and examples</u> of verb collocations with the noun 'magnet' used by ELLs in the second assessment task ("Explain why magnet A moves with magnet B")

Verb	Times used	Verb variants		Students examples
be	48			*"because the n and s are together"*
move	23	move with	9	*"because magnet A is moving with magnet B"*
		move	7	*"it can still move the other magnet"*
		move away	1	*"because it moves away the algae inside the tank"*
		move together	6	*"they move together because magnets stick together"*
stick	22	stick	5	*"because it sticks"*
		stick on*	3	*"they both stick on each other"*
		stuk* on*		*"because it stuk* on glass to gether*"*
		stick through	1	*"because they can still stick through glass"*
		stick to	2	*"because it is a magnet * stick* to other magnets"*
		stick together	11	*"because they stick together"*
attract	15	atrack*	1	*"magnet B atracks* magnet B"*
		atract*	3	*"because it atractes*"*
		attrack*	1	*"because they both attrack*"*
		attract	3	*"because it's trying to attract each other"*
		attract with*	2	*"it moves because N and S are in the right place so they attract with* each other"*
		attract together*	2	*"because they are attracting together"*
		attract to	3	
connect	9	connect	7	*"because they are connected"*
		conect*	2	*"because it is conected*"*
go [move]	6	go	3	*"because the magnet go* together"*
		go through	3	*"because it goes through the glass"*
attach	5	attach (to)	2	*"because magnet A is attached to magnet B"*
		attach together*	2	*"it moves because it is attached together"*
		atach*	1	*"because it is atach*"*
join	5	join	2	*"because it joins"*
		join together	2	*"because they are still joint together"*
touch	4			*"south and north are touching"*
pull	4	pull	3	*"because the magnet is pulling the algae"*
		pull at* (each other)	1	
have	3			
put	3			*because if he put it up it wont work*
make (out of)	2			
hold (on to)	1			*"because magnet B is holding on to magnet A"*
split apart	1			*"it makes the manit* split a *part"*
catch	1			*"*cause they both are made out of metal and magnet A catches magnet B and takes it along with it"*

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meet	1		
take	1		*"*cause they both are made out of metal and magnet A catches magnet B and takes it along with it"*
react	1		*"because there * reacting to each other"*
interact	1		*"because magnets can interact through solids, liquids and gas"*
push	1		
go together [be found]	1		

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