# The Relationship between Fear of Failure, Academic Motivation and Student Engagement in Higher Education: A General Linear Model

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This thesis results entirely from my own work and has not been offered previously for any other degree or diploma.

Signature .....**Nakhla**.....

## Abstract

Failure is an overwhelming experience that is associated with hostile, negative feelings and devastating consequences for many students. However, there is little effort on theorising fear of failure in education or examining its links with academic motivation and engagement. Researchers have called for investigating how fear operates in education and for developing a broader understanding of engagement in higher education. This study addresses this gap in knowledge. It examined the factor structure of two instruments designed to measure motivation and engagement and the influence of fear of failure on motivation and engagement in light of Self Determination Theory. It investigated how fear of failure and motivation clustered within students and if these clusters were differentially associated with engagement. Finally, it examined the modulatory role of extrinsic motivation, as a differentiated construct, in the relationship between fear of failure and engagement. Data were collected using self-reported instruments and analysed using the General Linear Model. Contributions introduced fear of failure as an influential factor of motivation and uncovered its direct and indirect effects on motivation and engagement, thus extending existing literature on fear of failure. Cluster analysis identified distinct profiles of students based on their fear of failure and motivation and established a positive link between fear of failure and extrinsic motivation. This study has extended the motivation literature by shedding new light on the positive modulatory role of extrinsic motivation, as a differentiated construct, in the relationship between fear of failure and engagement. Contributions also included the introduction of a new model that extends the self-determination continuum to acknowledge the existence of different learners and recognise the role of fear of failure among them. Finally, this study provided two modified instruments to measure motivation and engagement, thus contributing to existing measurement tools in United Kingdom higher education. Contributions to practice are implied; there is a need to recognise the significant impact of fear of failure on the dynamics of the learning environment and the importance of prompting self-inflicted behaviours. Comprehending the complexity of the learning environment in light of the complex nature of human behaviours is considered essential to improving teaching and learning.

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## List of Abbreviations

| | |
|---|---|
| AM | Amotivation |
| AMS | Academic Motivation Scale |
| CFA | Confirmatory Factor Analysis |
| CFI | Comparative Fit Index |
| EFA | Exploratory Factor Analysis |
| EI_E_10 | Engagement Indicator Emotional Engagement – item number 10 |
| EI_I_15 | Engagement Indicator Interaction/Participation Engagement – item 15 |
| EM | Extrinsic Motivation |
| EM_E_1 | Extrinsic Motivation External Regulation – item number 1 |
| EM_ID_3 | Extrinsic Motivation Identified Regulation – item number 3 |
| EM_IN_14 | Extrinsic Motivation Introjected Regulation – item number 14 |
| Eng | Engagement |
| EO_P_21 | Engagement Outcome Performance Engagement – item 21 |
| EO_S_1 | Engagement Outcome Skills Engagement – item number 1 |
| ESEM | Exploratory Structural Equation Modelling |
| FoF | Fear of Failure |
| IM | Intrinsic Motivation |
| IM_A_6 | Intrinsic Motivation Towards Accomplishment – item number 6 |
| IM_E_25 | Intrinsic Motivation To Experience Stimulation – item number 25 |
| IM_K_2 | Intrinsic Motivation To Know – item number 2 |
| Mot | Motivation |
| RMSEA | Root Mean Square Error of Approximation |
| SCEQ | Student Course Engagement Questionnaire |
| SD | Standard Deviation |

| | |
|---|---|
| SE | Standard Error |
| SEM | Structural Equation Modelling |
| SRMR | Standardized Root Mean Square Residual |
| TLI | Tucker-Lewis Index |
| Var | Variance |
| VIF | Variance Inflation Factor |

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# Chapter 1 Introduction and Background

## 1.1 Introduction

Taking examinations at school, college or university are essential aspects of learning; however, no one enjoys either the feelings of uneasy suspense associated with failing (as highlighted by Rachman, 1998) or its devastating consequences. This study examined fear of failure as an antecedent variable to orient students' academic motivation and engagement. Evans, Rich, Davies, and Allwood (2005) argued that research has tended to shy away from exploring negative emotions in education. I argue that until fear of failure is thoroughly investigated and profoundly challenged, our efforts in shaping students' educational outcomes will be undermined. It is recognised that exploring and challenging negative emotions in education require intentional and intrusive measures in place because failure is dangerous and is associated with appraisals of threats to the individual's ability to accomplish goals (Conroy & Elliot, 2004; Covington, 1992; Lazarus, 1991; Martin & Marsh, 2003).

This chapter outlines the background of the study and the rationale behind the research questions. It then presents Self Determination Theory as the guiding theoretical framework and offers a brief introduction to the constructs examined in this study. The methodology and unique contributions of this study to both current theory and practice are briefly discussed. Finally, a summary of the structure of the thesis concludes the chapter.

## 1.2 Rationale and Background

Fear of failure was found to have a significant inverse relationship with academic engagement (Caraway, Tucker, Reinke, & Hall, 2003). Student engagement is one of the major challenges that educators face on a daily basis. If you sit for long enough in the staff common room, at the university where I work during lunch time, it is unusual not to hear staff converse about the difficulties they encounter in engaging their undergraduate students with all aspects of the course they are enrolled on. Student engagement has been described as the '*current buzzword in higher education*' (Kahu, 2013, p. 758). It has been found that engaged and motivated students tend to perform considerably better than un-engaged and unmotivated students (Fredricks, Blumenfeld, & Paris, 2004).

Lack of engagement has many serious consequences including increased risk of dropping out and poor educational outcomes (Caraway, Tucker, Reinke, & Hall, 2003; Rachman, 1998; Skinner & Belmont, 1993). Despite the importance of student engagement, Lester (2013, p. 2) has noted that it is still loosely defined and that a unified definition has '*not congealed*'. Researchers have highlighted that the literature of student engagement is a '*mixed bag'* (Trowler, 2010, p.9) and hence called for the need to develop a broader understanding of the construct of engagement in higher education and a robust theorisation of this concept (Krause & Coates, 2008).

As an educator, I have come across fear of failure in the classroom and have seen how it had positively and negatively affected the academic motivation and engagement of the different students. Over the years, I have noted that students whom I would regard as not afraid of failing tend to perform better than the ones I would regard as afraid of

failing. Also, from observations, students seemed to display different levels of fear towards failing. I observed proactive students who showed genuine intrinsic curiosity in the subject and were academically motivated to engage in any learning task assigned to them. This group of students tended not to be afraid of failing. By contrast, I have observed passive students who worked in isolation, and relied on memorising what was needed for their examinations. This group of students tended to be highly anxious and relied on rote learning. Another low-achieving group of students I observed were the ones who did all they could to avoid effort. This group seemed to be afraid of failing and tended to describe any task assigned to them as boring. Researchers (Covington & Müeller, 2001; Elliot & Covington, 2001; Martin & Marsh, 2003) classified different learners into: optimists; overstrivers; self-protectors; and failure acceptors.

Fear of failure has been described as an impediment to success and one that shapes students' expectations and behaviours (Cox, 2009). Students who are afraid of failing doubt their ability to succeed, and experience anxiety that becomes detrimental to the degree of their academic motivation and engagement within their studies (Covington, 1992). Despite the way fear of failure has been portrayed in the literature, and despite researchers' repeated calls to examine fear in education (Jackson, 2010; 2013), it has continued to be an '*ill-defined and slippery*' (Jackson, 2010, p. 40) construct that has been relatively neglected (Jackson, 2013). To date, there is neither a clear definition of fear of failure in the literature nor an agreed method to operationalise it. It is important to focus on the diverse and often contradictory ways that fear operates in education (Jackson, 2010) in order to comprehend the complex nature of the human behaviour, and use such understandings to improve students' educational outcomes.

Research has tended to shy away from exploring negative emotions in education (Evans, Rich, Davies, & Allwood, 2005). Examining the relationship between fear of failure, academic motivation and engagement is essential to gaining insight into the complexity of the learning environment in light of the complex nature of human behaviours. This study is one of the first (Caraway, Tucker, Reinke, & Hall, 2003; Covington & Omelich, 1991; Clycq, Nouwen, & Vandenbroucke, 2014; De Castella, Byrne, & Covington, 2013) to investigate fear of failure as an antecedent variable to orient students' academic motivation and engagement.

### 1.3 Research Questions

This study set out with the aim to address existing gaps in the literature of fear of failure, academic motivation and engagement by examining the relationship between these three constructs. This study seeks to address the following research questions:

1. Do both the Academic Motivation Scale (AMS) (Vallerand, et al., 1992) and the Student Course Engagement Questionnaire (SCEQ) (Handelsman, Briggs, Sullivan, & Towler, 2005) demonstrate structural evidence of construct validity?
2. In light of Self Determination Theory, what is the influence of fear of failure on academic motivation and engagement?
3. Are there latent homogenous clusters of students with particular profiles of fear of failure and academic motivation and are these clusters differentially associated with student engagement?
4. Does extrinsic motivation, as a differentiated construct, modulate the relationship between fear of failure and engagement?

## 1.4 Theoretical Framework

Self Determination Theory, which is a broad framework for the study of human motivation and personality (Deci & Ryan, 2000), was used as the theoretical framework for this study. The theory assumes that individuals, no matter their age, gender, socioeconomic status, nationality, or cultural background, possess inherent growth tendencies that provide a motivational foundation for their engagement (Deci & Ryan, 2000; Vansteenkiste, Niemiec, & Soenens, 2010). The theory provides a comprehensive framework that explains human behaviour through the understanding of human motivation. It posits that all humans have innate desire to learn from birth, which is either supported or discouraged within their environment.

Although the theory is interested in human motivation and personality, it does not anticipate the factors that influence academic motivation. It fails to acknowledge that when students are afraid of failing, they display certain behaviours that impact on their academic motivation. It also fails to take into account the different learners (optimist students, overstriving students, self-protecting students, and failure accepting students) classified in the literature (Covington & Müeller, 2001; Elliot & Covington, 2001).

## 1.5 Introducing the Constructs

In order to answer the research questions and to be able to establish the influence of fear of failure on academic motivation and engagement, it was necessary to demonstrate that these three constructs were different (as presented in the literature). However, on reviewing the literature, inconsistencies in the conceptualisations of these three constructs were identified. Some researchers defined these constructs separately, while others used the different constructs interchangeably to refer to the same thing, as will

be discussed later. Hence, there is a need to clarify how these three constructs are conceptualised and quantified in this study. The aim is to demonstrate that these are three conceptually different constructs, not just by definition, but also in the way they operationalise.

Fear of failure has been conceptualised from a self-determination perspective, in terms of how an individual orientates to the consequences of failing, which serves as an antecedent variable to shape and influence their motivation and engagement. In other words, it is the dispositional orientation of an individual which serves as the antecedent variable that influences, either positively or negatively, their academic motivation and engagement. In order to examine the influence of fear of failure on motivation and engagement, it was logical to operationalise fear of failure in terms of its five aversive consequences as advocated by Conroy, Willow, and Metzler (2002). These were: fear of experiencing shame and embarrassment; fear of devaluing one's self-estimate; fear of having an uncertain future; fear of losing social influence; and fear of upsetting important others.

In line with Reeve's (2012) conceptualisation of academic motivation, this study defines it as the '*private, unobservable psychological, neural, and biological process that serves as an antecedent cause to the publically observable behaviour that is engagement*' (p. 151). As advocated by Self Determination Theory and theorised by Deci and Ryan (1985; 2000), academic motivation can be operationalised in terms of: intrinsic motivation (to know, to accomplish things, and to experience stimulation); extrinsic motivation (external regulation, introjected regulation, and identified regulation); and amotivation.

Student engagement has been conceptualised as the measure of students' intrinsic involvement in learning and key educational processes and the publically observed effect of academic motivation (Reeve, 2012). It was operationalised in terms of four facets as advocated by Handelsman, Briggs, Sullivan, and Towler (2005): skills engagement (which represented student engagement through practicing skills); emotional engagement (which represented student engagement through emotional involvement with the class material); participation engagement (which represented student engagement through participation in class activities and interactions with other students); and performance engagement (which represented student engagement through levels of performance in the class).

An in-depth review of the conceptualisations of these three constructs and why they were operationalised in these particular ways is presented in chapter 2 (section 2.3, section 2.4, and section 2.6).

### 1.6 Methodology

The choice of methodology was driven by the research questions and the nature of the social phenomenon under investigation, which is fear of failure. Fear of failure is a lived reality for many students and is closely linked to self-image and self-esteem, hence it was essential to collect data anonymously to allow the participants to be as honest and reflective in their responses as possible. It was also vital to minimise the intrapersonal linking and subjectivity of judgements by ensuring that the researcher and the participants had no direct or indirect influence on each other. Hence, the objectivists' stance was considered as being important in order to get close to what would be regarded as the objective truth and meaning of the constructs under investigation, given

the complexity of the human behaviour. A post-positivist approach to the theoretical perspective was taken, to investigate the hypotheses formulated from reviewing the literature and to gain positive outcomes about claims of knowledge (Creswell, 2002). This stance taken warranted a quantitative anonymous approach, to minimise the participants' subconscious tendency to paint a positive picture of oneself or avoid giving a negative impression (as discussed in chapter 3).

In this study, the data for academic motivation and engagement were collected using the Academic Motivation Scale (AMS) (Vallerand, et al., 1992) and the Student Course Engagement Questionnaire (SCEQ) (Handelsman, Briggs, Sullivan, & Towler, 2005), which are self-reported instruments. Several researchers (Cokley, Bernard, Cunningham, & Motoike, 2001; Fairchild, Horst, Finney, & Barron, 2005; Guay, Morin, Litalien, Valois, & Vallerand, 2015) have made explicit calls for further investigations regarding the structural component of the AMS scale '*to feel confident in the scale's use as an assessment tool in motivational research*' (Fairchild, Horst, Finney, & Barron, 2005, p. 337). Also, Guay, Morin, Litalien, Valois, and Vallerand (2015) called on other researchers to test the AMS's validity using structural equation modelling with more diverse samples (elementary school students, university students) to see if their results are corroborated. Similarly, Handelsman, Briggs, Sullivan, and Towler (2005) called for the validation of the SCEQ instrument that they have developed and for focusing on the relation of this measure with other constructs.

Given the explicit calls made by other researchers to further investigate both scales, I had to be confident that these instruments truly measure what they intended to measure

before using them. Therefore, I examined their factor structure before linking them with other constructs such as fear of failure using a sample of university students.

### 1.7 Originality and Contribution

This section provides a brief summary of the unique contributions of my study which inform both existing theory and practice. Academic motivation and engagement have either been studied independently or together, but their relationship with fear of failure has not been published in the research literature. Contributions to the literature include six main areas.

First, this study contributes to the small body of existing literature on fear of failure by providing the first documentation that uncovers how students' fear of failing impacts on their academic motivation and engagement. It establishes direct and indirect effects of fear of failure on academic motivation and engagement. This contribution adds to existing understanding, because fear of failure was found to be related to slow information accumulation, and reduced learning rates during tasks (Lerche, Neubauer, & Voss, 2018). Second, the positive link between fear of failure and extrinsic motivation is a novel finding. To my knowledge, this study is the first to use cluster analysis to identify distinct profiles of students based on their fear of failure and motivation. This contribution is important because it helps gain better understanding of an individual's experiences and depicts particular profiles within the student population.

Third, is the positive mediating role of both identified and introjected regulations in the relationship between fear of failure and both skills engagement and emotional

engagement. Fourth, the positive moderating role of introjected regulation in the relationship between fear of failure and both participation and performance engagement is a unique finding. The modulatory role of extrinsic motivation has been missing from existing literature. These findings extend the motivation literature by shedding light on the importance of using self-endorsed and self-imposed regulations to modulate the influence of fear of failure on student engagement. Understanding the role of self-imposed and self-endorsed behaviours in influencing fear of failure and student engagement is vital because researchers have confirmed that fear of failure has an inverse relationship with student engagement (Caraway, Tucker, Reinke, & Hall, 2003).

Fifth, is creating a new motivational model which is based on reviewing existing literature in light of Self Determination Theory. This is the first study that applies Self Determination Theory in conjunction with existing literature to introduce and explain the motivation diversity that students bring into the complex learning environment. The new model extends the Self Determination continuum to acknowledge the existence of the different learners and recognise the role of fear of failure among these learners within the learning environment. This contribution is crucial, because understanding the complexity of the learning environment in light of the complex nature of human behaviour is essential to improve teaching and learning.

Finally, this study contributes to existing measurement tools in higher education. It validated and provided modified versions of the AMS instrument to measure academic motivation and the SCEQ instrument to measure engagement in higher education. This outcome provides for the necessity to have instruments that have been validated among

students from the United Kingdom in order to accurately measure these important constructs.

Contributions to practice have been implied through two insights. The first insight is the significant impact of fear of failure on the dynamics of academic engagement within the learning environment and the importance of minimising students' fear of failure. The second insight is recognising the importance of prompting self-inflicted behaviours in the form of introjected regulation in order to moderate the relationship between fear of failure and both participation and performance engagement. This could be in the form of positive fear appeal messages that aim to be evaluated by students as challenging, not threatening, such as communicating competence or how to take a course of action to avoid failure (see Putwain, Nakhla et al. (2016; 2017) and Nicholson, Putwain, Nakhla et al. (2018)).

Further details of these contributions are discussed in chapter 5 (section 5.5).

### 1.8 Structure of the Thesis

Chapter 2 outlines the theoretical context of this study and highlights the need to examine the factor structure of self-reported instruments when used as part of data collection. It then searches the small body of existing literature on fear of failure highlighting the limited theorising of fear of failure or examining its links with other constructs. Next, it searches the existing literature on academic motivation and highlights the gap in recognising the modulatory role of extrinsic motivation in the relationship between fear of failure and engagement. Factors influencing academic motivation are also highlighted; the need for examining fear of failure as a new

influential factor on academic motivation is argued. The chapter then searches existing literature for characteristics of different learners and for different typologies of student engagement, highlighting dimensions of student engagement used in this study. Finally, a statement highlighting the problem is presented.

Chapter 3 discusses the research paradigm, including the theoretical stance taken, epistemology, methodology, and study design. It describes the data collection procedures and methods chosen for data screening and data analyses. Finally, ethical considerations and a summary of how power is used to set and evaluate this study, concludes this chapter.

Chapter 4 presents and scrutinises the data. It describes the sample demographics and how the data were screened for issues of normality, outliers, homoscedasticity and multicollinearity. It then presents the results from conducting various analyses and discusses threats of reliability, validity and issues of common method variance.

Chapter 5 discusses findings of this study and its unique contributions to both current theory and practice in light of Self Determination Theory. The discussion is geared to answering the research questions posed, highlighting the contribution of this research and its importance. It also introduces a new model that explains motivation diversity among different learners and extends the self-determination continuum to acknowledge the existence of different learners and the role of fear of failure. This chapter also provides recommendations for future research and discusses limitations of this study.

## 1.9 Chapter Summary

This study aims to develop a better understanding of how fear of failure influences academic motivation and engagement. In education, fear of failure is powerful, pervasive (Jackson, 2010), counterproductive (Cox, 2009) and is associated with a number of aversive consequences (Conroy, 2001). It was found to have a significant inverse relationship with academic engagement (Caraway, Tucker, Reinke, & Hall, 2003). Moreover, there is limited theorising of the fear of failure or examining its links with other constructs such as academic motivation, and engagement. Researchers have called for investigating how fear operates in education (Jackson, 2010) and for developing a broader understanding of the construct of engagement in higher education (Krause & Coates, 2008). Therefore, it is argued that examining fear of failure is important since it influences academic motivation and engagement of different learners, with details yet to be established. The next chapter outlines the theoretical framework of this study and searches the body of existing literature on fear of failure, academic motivation and student engagement.

# Chapter 2 Literature Review

## 2.1 Chapter Overview

This chapter presents Self Determination Theory as the framework of this study. It highlights some of the calls made by other researchers and argues for the need to examine the factor structure of self-reported instruments when used as part of data collection. It searches the small body of existing literature on fear of failure, highlighting the limited focus on theorising fear of failure or examining its links with other constructs such as academic motivation and engagement. This chapter presents the definition of fear of failure from a self-determination perspective as the dispositional orientation of an individual which serves as the antecedent variable that influences, either positively or negatively, their motivation and engagement. It also highlights the calls made for focusing *'more attention on the diverse and often contradictory ways that fear operates in education*' (Jackson, 2010, p. 40), and stresses its significant inverse relationship with academic engagement (Caraway, Tucker, Reinke, & Hall, 2003).

Additionally, this chapter searches existing literature on academic motivation and defines it as the unobserved process which acts as the antecedent cause to student engagement (Reeve, 2012). Factors influencing academic motivation are highlighted, and the need for examining fear of failure as a new influential factor of academic motivation is strongly argued. This chapter then searches the literature on extrinsic motivation and highlights the gap in linking its different regulations to fear of failure and student engagement. The need to examine the modulatory role of extrinsic motivation, as a differentiated construct, in the relationship between fear of failure and

student engagement is then argued. Next, this chapter searches for characteristics of different learners in the literature and highlights the need to extend the self-determination continuum to acknowledge the existence of different learners and the role of fear of failure among them. It also argues for the need to investigate existing undergraduate student populations for clusters based on fear of failure and motivation, and examines student engagement within these clusters.

Finally, this chapter defines engagement as the measure of students' intrinsic involvement in learning and the publically observed effect of academic motivation (Reeve, 2012). Different typologies and dimensions of student engagement in the existing literature are discussed and the one used in this study is highlighted. A statement highlighting the above arguments concludes this chapter.

### 2.2 The Theoretical Framework

Self Determination Theory, which is a broad framework for the study of human motivation and personality (Deci & Ryan, 2000), was used as the theoretical framework for this study. The theory assumes that individuals, no matter their age, gender, socioeconomic status, nationality, or cultural background, possess inherent growth tendencies that provide a motivational foundation for their engagement (Deci & Ryan, 2000; Vansteenkiste, Niemiec, & Soenens, 2010). Self Determination Theory accepts that all individuals have natural innate and constructive tendencies to develop an elaborated and unified sense of self (Deci & Ryan, 2002). It focuses on the degree to which an individual's behaviour is self-motivated and self-determined (Deci & Ryan, 2002), and acknowledges that sometimes individuals lack self-motivation and display disaffection (Reeve, 2012). The theory advocates that psychological growth should

neither be taken as a given, nor should it be assumed not to exist; however, it must be viewed as a dynamic potential that requires conditions of nurturance (Deci & Ryan, 2002).

Self Determination Theory has had substantial influence in the fields of health, education and psychology. It was essential to locate this present study within Self Determination Theory for a number of reasons. Researchers have described the theory as '*an impressive accomplishment*' (Psyszczynski, Greenberg & Solomon, 2000, p. 301) and '*the most ambitious contribution to what some have termed the rebirth of motivational research'* (Hennessey, 2000, p. 293). This study takes a view of academic motivation as an unobserved construct that is privately experienced by students and is not visible to educators; however, its impact on students' engagement can be publicly visible (Reeve, 2012). In other words, engagement is an outcome that arises out of being academically motivated. Moreover, out of the various perspectives that researchers have used to define engagement, in this study engagement was seen as a measure of students' intrinsic involvement in the learning. Given that Self Determination Theory is a broad framework for the study of human motivation and personality (Deci & Ryan, 2000), it was logical to locate this study within Self Determination Theory.

Furthermore, the theory provides '*new impetus to research on human motivation*' (Coleman, 2000, p. 291), and presents a virtuous overarching theoretical framework to guide my research questions which are derived from gaps in the motivation literature. Emphasis is placed on two main issues. The first emphasis is on examining the learning environment in light of the complex nature of student behaviour, and is represented in

the relationship between students' fear of failure, their academic motivation and engagement. Students' motivation to engage in an activity seems dependent on their experience with success or failure while performing a similar task. Self Determination Theory offers a comprehensive framework to help untangle the complex relationships presented by my second research question, that is, how students' fear of failure influence their academic motivation and engagement within the learning environment.

The second emphasis is that educators cannot always rely on intrinsic motivation to maximise student engagement but have to employ various extrinsic incentives to motivate and engage students. Self Determination Theory differentiates the construct of extrinsic motivation into four regulations and presents these regulations along a motivational continuum (see section 2.4.2, section 2.4.3 and Figure 2.1). The theory offers an inclusive framework to help answer the fourth research question, that is, the modulatory role of the motivation regulations in the relationship between fear of failure and student engagement.

On the other hand, Self Determination Theory in its current state bears a number of limitations. Although the theory represents a framework of human motivation and personality, it does not anticipate many of the factors that influence academic motivation; hence the need to examine fear of failure as an influential factor of academic motivation. The theory assumes that all individuals possess inherent growth tendencies for their motivation and basic psychological needs for optimal functioning, but it fails to acknowledge that individuals also have free will and the choice to learn. The theory does not also have a developmental focus, since it does not differentiate between the

motivation of the different age groups of individuals (e.g. school students or higher education students).

Furthermore, the methods that have been used to assess academic motivation and their impact on developing the theory, is yet another compounding limitation. Researchers (e.g. Vallerand, Blais, Brière, & Pelletier, 1989; Cokley, Bernard, Cunningham, & Motoike, 2001; Fairchild, Horst, Finney, & Barron, 2005; Guay, Morin, Litalien, Valois, & Vallerand, 2015) have developed and used self-reported instruments that use Likert scales and rely on participants' subjective experiences to measure the multidimensional conceptualisation of academic motivation offered by Self Determination Theory. Therefore, there is a driving need to further validate the available instruments among other, diverse samples of participants to inform Self Determination Theory.

Moreover, the theory fails to acknowledge that when students are afraid of failing they display certain behaviours that impact on their academic motivation. It also fails to take into account the motivation diversity among the different learners who are characterised in the literature (optimist, overstrivers, self-protectors and failure acceptors). This study strongly argues for the need to extend the self-determination continuum to acknowledge the existence of different learners within the learning environment and the role of fear of failure among them. The aim is to enrich our understanding of the complexity of the learning environment in light of the complex nature of human behaviours.

## 2.3 Fear of Failure in Education

Fear of failure has been identified as one of the numerous antecedent variables to orient students' academic motivation and achievement (Caraway, Tucker, Reinke, & Hall, 2003; Griffore, 1977; Pantziara & Philippou, 2015). Researchers have confirmed that students who are dominated by their fear of failure display feelings of depression or panic (Entwistle, Thompson, & Wilson, 1974; Entwistle, 1988). This section provides a review of the definitions of fear of failure and its various perspectives within the existing literature. A summary of gaps identified from reviewing the small body of existing literature on fear of failure and an argument for the research questions concludes this section.

### 2.3.1 Defining Fear of Failure

Researchers have long been attempting to define the construct of fear. Bauman (2006, pp. 1-2) defined fear as the '*feeling known to every living creature*' and the name we give to our '*uncertainty*' and '*ignorance of the threat*'. In the same vein, it is also defined as the '*normal reaction to a real or imagined threat*' (Gullone, 2000, p. 429) and the '*feeling of uneasy suspense, the tense anticipation of a threatening but obscure event*' that increases the drive to '*escape or avoid*' (Rachman, 1998, p. 26). Fear of failure is believed to influence '*how the individual defines, orientates to and experience failure in achievement situations*' (McGregor & Elliot, 2005, p. 219) and conceptualised as '*a need, a motive and an affective tendency*' (Conroy, 2003, p. 758).

Fear of failure was also defined as a factor that can motivate successful performers '*to reach a high level of performance or prevent them from actualizing their potential*' (Conroy, Willow, & Metzler, 2002, p. 76). Entwistle's (1988) findings showed that

students use their fear of failure as a source of continued effort to achieve success while unsuccessful students see failure as an attack to their self-esteem and self-worth.

Researchers have argued that fear of failure could be meaningless if not defined in conjunction with its dreaded consequences (Conroy & Elliot, 2004). Fear of failure is believed to be associated with aversive consequences including: experiencing shame and embarrassment; devaluing one's self-estimate; having an uncertain future; losing social influence; and upsetting important others (Conroy, 2001; Conroy, Metzler, & Hofer, 2003; Conroy, Willow, & Metzler, 2002; Hagtvet & Benson, 1997; McGregor & Elliot, 2005). It is also believed to negatively predict change in students' affective well-being when preparing for an examination (Berger & Freund, 2012).

Little effort leading to failure was found to be excused by reasons of illness to moderate the associated feelings of shame and incompetence (Covington, 1992). Fear of failure was found to be associated with an anticipated threat to self-esteem (Entwistle, 1988) and included feelings of incompetence, negative self-evaluation, and expectation of failure (McGregor & Elliot, 2005; Pantziara & Philippou, 2015). Fear of failure and globetrotting were found to be linked to surface approaches to studying, and were associated with general feelings of anxiety, tenseness and inadequacy (Entwistle & Ramsden, 1983).

Despite the several attempts made by researchers, a clear definition of this construct is still absent from the literature. Jackson (2010, p. 40) noted the difficulty in defining fear in education and attributed its absence in the literature to the assumption that '*everyone knows what it is*'. In this thesis, fear of failure in education is conceptualised

from a self-determination perspective. It is defined as how an individual orientates to the consequences of failing, that serves as an antecedent variable to shape and influence their motivation and engagement. In other words, the fierce consequences of fear of failure serve as antecedent variables that impact either positively or negatively on students' academic motivation and engagement. Therefore, in this thesis, fear of failure was operationalised in terms of its five aversive consequences as advocated by Conroy, Willow, and Metzler (2002). These were: fear of experiencing shame and embarrassment; fear of devaluing one's self-estimate; fear of having an uncertain future; fear of losing social influence; and fear of upsetting important others.

### 2.3.2 Fear of Failure in the Literature

Fear of failure has been examined to understand students' learning behaviour and found to be associated with the appraisals of threats to the individual's ability to accomplish goals. Achievement Goal Theory was used to investigate the associations among affective constructs, and the extent to which these constructs influence students' performance and interest in mathematics (Pantziara & Philippou, 2015). Pantziara and Philippou's findings revealed that students' performance and interest in mathematics were influenced by fear of failure, self-efficacy beliefs, and achievement goals. In the same vein, Conroy and Elliot (2004) examined the hierarchical model of achievement motivation among college students. Conroy and Elliot's findings showed that fear of failure was positively related to mastery-avoidance, performance-approach, and performance-avoidance achievement goals. Fear of failure predicted a change in mastery-avoidance and performance-avoidance goals. Conroy and Elliot's results were consistent with the hierarchical model of achievement motivation and suggest that fear of failure may have an influence on achievement goals.

Self-worth Theory was used to examine fear of failure in relation to students' underachievement and disengagement at school. De Castella, Byrne, and Covington (2013) used the quadripolar model of need achievement to explore how approach and avoidance orientations are related to self-handicapping, defensive pessimism and helplessness in Eastern and Western settings. Their findings showed that among Japanese high school students, helplessness and self-handicapping were found to be highest when students were low in success orientation, and high fear of failure. These findings were also replicated among Australian students. Success orientation was found to moderate the relationship between fear of failure and academic engagement in both cultures. These results suggest that in the absence of firm achievement goals, fear of failure is associated with a range of maladaptive self-protective strategies.

Different constructs have also been examined in relation to fear of failure. Caraway, Tucker, Reinke, and Hall (2003) examined fear of failure, self-efficacy and goal orientation in relation to school engagement among adolescent students. Their results showed that fear of failure had an inverse relationship with school engagement and was found to be a significant predictor of grade point average. Berger and Freund (2012) examined fear of failure in relation to disorganisation, and affective well-being among college students. Their findings showed that fear of failure was related to disorganisation and negatively predicted a change in affective well-being. McGregor and Elliot (2005) examined fear of failure in association with shame in two studies. Their findings from study 1 reported that individuals who were high in fear of failure reported greater shame upon a perceived failure experience than those who were low in fear of failure. These findings were replicated in study 2, where individuals with high

fear of failure also reported greater shame, overgeneralisation, and closeness than those who were low in of fear of failure.

Fear of failure was also found to be an antecedent of academic procrastination. Schouwenburg (1992) examined procrastination and fear of failure among students from the Netherlands. His results showed that procrastination and fear of failure appeared unrelated; however, trait procrastination and fear of failure may interact and result in increased levels of procrastinatory behaviours. In the same vein, Haghbin, McCaffrey, and Pychyl (2012) examined the indirect and conditional relation between fear of failure and procrastination among university students. Their results showed that the relationship between fear of failure and procrastination was moderated by perceived competence. Fear of failure was found to negatively affect satisfaction of the need for autonomy, which in turn increased the likelihood of problematic delay on academic and everyday-life tasks. Similarly, the relationship between fear of failure, procrastination and motivation of working women was assessed by Dixit (2017). Dixit's results showed that as motivation decreased, fear of failure and procrastination were found to increase among working women.

Psychological stress during examinations was also examined in relation to fear of failure among secondary school students. Buch, Vyas, and Moitra (2019) designed a study to document stressors and anti-stressors related to examinations. Their results showed that examinations were associated with worry, nervousness and fear, and that fear of failure added to this stress. Fear of failure was also examined as a determinant of unrealistic vocational aspiration among college students (Mahone, 1960). Mahone's findings showed that students who were fearful of failure were generally avoidant in their

behaviour in competitive achievement situations. In contrast, students who were relatively strong in motivation to achieve success tended to prefer ventures where the probability of success is intermediate. Lerche, Neubauer and Voss (2018) employed a diffusion model analysis to disentangle the different components involved in the execution of tasks. Their results showed that high implicit fear of failure among participants was related to slow information accumulation, and reduced learning rates during tasks.

Fear of failure was also examined in relation to hope of success and need achievement where freshmen students were given a level-of-aspiration questionnaire designed to give an independent measure of the hope of success and fear of failure continuum (Clark, Teevan, & Ricciuti, 1956). Their findings showed that students at the extremes of the continuum had lower need achievement scores than students in the middle of the continuum. In the same vein, Pang, Villacorta, Chin, and Morrison (2009) examined the relationships between implicit and explicit hope of success and fear of failure, and memory and liking for successful and unsuccessful peers among Singaporean students. Their results showed that students who were motivated by their fear of failure rated themselves worse-performing. Implicit and explicit fear of failure were both found to predict biases for the unsuccessful student. Fear of failure was also examined in relation to fear of success by Jackaway and Teevan (1976). Their findings showed significant positive correlations between both fear of failure and fear of success under neutral and aroused conditions and suggested theoretical similarities in the definitions of the motives.

Fear of failure in the form of teachers' use of fear appeals was examined in relation to students' appraisal and engagement before high-stakes examinations (see Putwain, Nakhla et al. (2016; 2017) and Nicholson, Putwain, Nakhla et al. (2018)). It emerged as a form of contrasting motivation in Entwistle, Thompson, and Wilson's (1974) findings and from their follow-up study (Entwistle & Wilson, 1977) where distinctive clusters of students were identified with two different forms of motivation (hope of success and fear of failure). It also emerged as a motivational factor when examining students' approaches to studying (see Biggs, (1976; 1987)). In sports, fear of failure was examined in relation to hope of success and the different aspects of perfectionism by Sagar and Stoeber (2009); and in relation to hope of success and risk-taking behaviour among elementary school boys shooting volleyball by Decharms and Dave (1965).

### 2.3.3 Summary

Reviewing the small body of existing literature on fear of failure revealed that researchers have associated fear of failure with: a number of aversive consequences (Conroy, 2001); feelings of shame and incompetence (Covington, 1992); maladaptive self-protective behaviours (De Castella, Byrne, & Covington, 2013); shame (McGregor & Elliot, 2005); disorganisation (Berger & Freund, 2012); academic procrastination (Schouwenburg, 1992); and feelings of incompetence, negative self-evaluation, and expectation of failure (McGregor & Elliot, 2005; Pantziara & Philippou, 2015). Researchers have also described fear in education as: powerful, pervasive (Jackson, 2010); counterproductive, an impediment to success (Cox, 2009); and a threat to self-esteem (Entwistle, 1988).

Despite the way fear of failure has been portrayed in the literature, and despite researchers' repeated calls to examine fear in education (Jackson, 2010; 2013), it has continued to be an '*ill-defined and slippery*' (Jackson, 2010, p. 40) construct that has been relatively neglected (Jackson, 2013). To date, there is neither a clear definition of fear of failure in the literature nor an agreed way to operationalise it among educational researchers. Furthermore, there is little effort on theorising fear of failure or examining its links with other important constructs such as academic motivation and student engagement, particularly among undergraduate students in the United Kingdom. Understanding how fear operates in education is important for developing theories and practices (Jackson, 2013); however, research has tended to shy away from exploring negative emotions in education (Evans, Rich, Davies, & Allwood, 2005).

This study defines fear of failure as the dispositional orientation of an individual which serves as the antecedent variable that influences, either positively or negatively, their academic motivation and engagement. As discussed in chapter 3, fear of failure was operationalised using the Performance Failure Appraisal Inventory developed by Conroy, Willow, and Metzler (2002). This thesis argues for the need to investigate the influence of fear of failure on academic motivation and student engagement in light of Self Determination Theory.

### 2.4 Academic Motivation

Motivation and engagement have been used interchangeably in the literature to refer to the same thing (Crookes & Schmidt, 1991; National Research Council & Institute of Medicine, 2004). In this thesis, academic motivation is defined as the unobserved process which acts as the antecedent cause to student engagement (Reeve, 2012). Put

differently, motivation influences the level of students' *'engagement in their learning; that is, it influences how actively involved students are in their work*' (Headden & McKay, 2015, p. 4). This section provides a review of the definitions of academic motivation and its conceptualisations. The motivation continuum and the factors influencing academic motivation in the literature are also discussed. A summary of the gaps identified from reviewing the body of existing literature on academic motivation and an argument for the research questions concludes this section.

### 2.4.1 Defining Academic Motivation

Motivation has long been a topic of interest to researchers in the fields of psychology and education. Several researchers have defined academic motivation from a behavioural perspective (Bergin, Ford, & Hess, 1993; Petri, 1981; Reeve, 2009). These studies referred to motivation as the force that energises and directs behaviour (Reeve, 2009), and '*the reasons underlying behavior*' (Guay, et al., 2010, p. 712). Academic motivation has been referred to as the '*concept we use when we describe the forces acting on or within an organism to initiate and direct behavior*' (Petri, 1981, p. 3). In the same vein, it was described as the psychological processes involved in the direction, vigour, and persistence of behaviour (Beck, 1978; Bergin, Ford, & Hess, 1993; Franken, 1988). For one to be motivated, they are said to be '*moved to do something*' (Ryan & Deci, 2000, p. 54).

Headden and McKay (2015, p. 4) described motivation as '*the directing of energy and passion toward a goal; it is what starts, directs, sustains, and stops behavior*'. In the same vein, Deckers (2010) defined it as the journey undertaken to achieve a goal. Motivation has also been related to the amount of intellectual energy utilised in learning

activities and has been employed to explain the different levels of students' performance (Entwistle, 1988). It was also found to positively correlate to self-esteem and achievement (Topçu & Leana-Taşcılar, 2018).

Motivation has also been described from the perspective of students' learning experiences to demonstrate the existence of groups of students with contrasting forms of motivation by Entwistle and Wilson (1977). Their results from cluster analysis have identified three different groups of students. The first group was motivated by hope for success. This group of students were highly motivated, had effective study methods and demonstrated repeated intellectual mastery. The second cluster consisted of students who had perceived low self-confidence and were motivated by their fear of failure. The third cluster consisted of students who were highly motivated, had effective study methods and were not bound by the syllabus. Entwistle and Wilson also identified another cluster of students who were unsuccessful. This group had active social interests; however, combined with low motivation, ineffective study methods and poor A-Level grades.

Other researchers have used motivation and engagement interchangeably in the literature to refer to the same thing (Crookes & Schmidt, 1991; National Research Council & Institute of Medicine, 2004). They have defined academic motivation as '*engagement in and persistence with the learning task*', '*without the need for continual encouragement or direction*' (Crookes & Schmidt, 1991, p. 480). These definitions reflect ambiguity and collectively are parochial, since they not only considered academic motivation from a single perspective but also failed to acknowledge that academic motivation and engagement are two different and distinct constructs.

### 2.4.2 Conceptualising Academic Motivation

Researchers have posited different views in conceptualising academic motivation. This section presents a review of three of these views in order to gain a better understanding of the motivation diversity among different learners. Bandura (1986) theorised motivation as a unitary concept. He hypothesised that human performance results from the reciprocal interactions between: personal factors (such as beliefs, expectations and attitudes), behavioural factors and environmental factors. He distinguished three broad classes (biological, social, and cognitive) through which motivation operates. Bandura acknowledged that social incentives (such as rewards) act as a motivator; however, he failed to differentiate this any further. Moreover, his depiction also failed to explain how motivation changes over time and how different students display different motivation levels.

Entwistle (1987) identified several distinct forms of motivation (competence, extrinsic, and intrinsic). Competence motivation refers to positive orientation towards learning and is created by the repeated experience of successful learning activities. Extrinsic motivation refers to seeking external reinforcement for learning (e.g. marks, grades, or qualifications). Intrinsic motivation refers to either learning that is explained by interest and perceived relevance, or achievement motivation that relies on achievements and self-confidence. This depiction of motivation describes learning in terms of traits and is derived from students' learning experiences.

On the other hand, Self Determination Theory (Deci & Ryan, 2008) proposed a multidimensional conceptualisation of motivation that differentiates between three

major categories of motivation: intrinsic motivation, extrinsic motivation and amotivation.

**Intrinsic Motivation**

Intrinsically motivated students are engaged in the work for inherent pleasure and satisfaction, as their motivation emanates from a full sense of choice and without the involvement of rewards or constraints (Deci & Ryan, 1985; 2000; Ryan & Deci, 2000; 2002; Vansteenkiste, Niemiec, & Soenens, 2010). Intrinsic motivation stems from the innate psychological needs of competence and self-determination (Deci & Ryan, 2008). Intrinsic motivation is when an activity is being performed not because of a reward that is being earned but because the activity is in itself rewarding (Whang & Hancock, 1994).

A tripartite taxonomy of intrinsic motivation has identified three types of intrinsic motivation: to know, to accomplish things, and to experience stimulation (Vallerand, et al., 1992). First, intrinsic motivation to know is defined as the '*fact of performing an activity for the pleasure and satisfaction that one experiences while leaning, exploring, or trying to understand something new*' (Vallerand, et al., 1992, p. 1005). For example, students are intrinsically motivated to know, when they are engaged in an activity for the pleasure they experience while wanting to know this new activity. Second, intrinsic motivation toward accomplishments is defined as '*the fact of engaging in an activity for the pleasure and satisfaction experienced when one attempts to accomplish or create something*' (Vallerand, et al., 1992, p. 1005). This type of intrinsic motivation is where students focus on the process of accomplishing and experiencing pleasure and satisfaction in their unique accomplishments. Finally, intrinsic motivation to

experience stimulation is defined as the experience of intense stimulating sensations, such as sensory pleasure, excitement, and feelings of cognitive pleasure derived from one's engagement in an activity (Vallerand, et al., 1992).

**Extrinsic Motivation**

Extrinsic motivation is a '*construct that pertains whenever an activity is done in order to attain some separable outcome*' (Ryan & Deci, 2000, p. 60). Hence, extrinsically motivated students are instrumental to separable consequences (Deci, Vallerand, Pelletier, & Ryan, 1991) since they are engaged in the activity to get something outside of the activity itself (Whang & Hancock, 1994). External incentives such as gold stars and grades are believed to decrease intrinisc motivation and inhibit the will to learn for its own sake (Vallerand, Deci, & Ryan, 1987). However, Covington and Müeller (2001) criticised this view and advocated that the true enemy of intrinsic engagement is the pursuit of avoidance goals driven by fear of failure.

Ryan and Deci (2000) proposed four types of extrinsic motivation: external, introjected, identified, and integrated regulation. External regulation is the least self-determined form of extrinsic motivation as the personal value of the behaviour is very low. It refers to behaviours where the loci of initiation is external. In this form of extrinsic motivation the behaviour is '*controlled by specific external contingencies*' (Deci & Ryan, 2000, p. 236) that is administered by others, such as achieving externally imposed rewards or avoiding punishment. When these contingencies are withdrawn, students are predicted to show poor maintenance to their motivation as their behaviours are contingency dependant (Deci & Ryan, 1985).

Introjected regulation refers to regulations which involve internalised rules or demands that pressure one to behave in order to avoid the consequences administered by the individuals to themselves (Deci & Ryan, 2000). These are in the form of self-imposed or self-inflicted behaviours which include ego involvements or threats of guilt or shame in order to maintain self-worth in the eyes of others. This form of extrinsic motivation is partially internalised as the regulations, although within the person, are not part of the integrated self; hence, the resulting behaviours are not self-determined (Deci & Ryan, 2000).

Identified regulation occurs when the student has come to value the behaviour and has accepted the regulatory process which has become part of the self. This regulation is a self-endorsed regulation which has a sense of personal commitment behind it, as the student consciously accepts and values the regulation and is willing to transform behaviour in order to achieve personally-valued outcomes. In this type of extrinsic motivation, the behaviour has become part of the individual's identity; hence individuals have fully internalised the regulation and fully accepted it as their own (Deci & Ryan, 2000). Although identified regulation is associated with higher commitment and performance, it is still considered instrumental because it is not being done as a source of spontaneous enjoyment and satisfaction (Deci & Ryan, 2000).

Integrated regulation is the most autonomous type of extrinsic motivation. It occurs when the regulatory process is fully integrated with the individual's coherent sense of self as they identify with the importance of the behaviour (Deci & Ryan, 2000). This type of extrinsic motivation is related to intrinsic motivation since both are self-regulated, but they are different, as intrinsic motivation is characterised by interest in

the activity itself, whereas integrated regulation is characterised by the activity being personally important for a valued outcome (Deci, Vallerand, Pelletier, & Ryan, 1991). Vansteenkiste, Lens, De Witte, De Witt, and Deci (2004) found evidence to support the combination of external and introjected regulation into controlled motivation, and identified and intrinsic motivation into autonomous motivation.

**Amotivation**

Amotivation is quite similar to the concept of learned helplessness (Abramson, Seligman, & Teasdale, 1978). It is defined as the absence of motivation towards an activity and the '*state of lacking an intention to act*' (Ryan & Deci, 2000, p. 61). It occurs when an individual's behaviour '*is instigated or directed by a negative or undesirable event or possibility*' (Elliot, 1999, p. 170) causing a lack of '*a sense of personal causation*' (Ryan & Deci, 2000, p. 61). Amotivated individuals are neither intrinsically nor extrinsically motivated. They experience feelings of incompetence and lack of control, particularly when set performance goals (Deci & Ryan, 1985; Elliot, 1999). They '*do not perceive contingencies between outcomes and their own actions*' (Vallerand, et al., 1992, p. 1007); therefore, they avoid demonstrating their lack of competence relative to others (Elliot, 1999). They stop participating in academic activities when they feel that their behaviour is caused by forces out of their own control and hence experience further feelings of incompetence and expectancies of uncontrollability (Vallerand, et al., 1992).

### 2.4.3 The Motivational Continuum

The perspective of a single continuum, where the different types of motivation progress from amotivation to extrinsic motivation (which includes: external, introjected,

identified and integrated motivation), to intrinsic motivation was examined and supported by many researchers (Blais, Sabourin, Boucher, & Vallerand, 1990; Goudas, Biddle, & Fox, 1994; Leal, Miranda, & Carmo, 2013; Villacorta, Koestner, & Lekes, 2003). On the other hand, some researchers (Amabile, Hill, Hennessey, & Tighe, 1994; Chemolli & Gagné, 2014; Clycq, Nouwen, & Vandenbroucke, 2014) refuted this perspective. Amabile, Hill, Hennessey, and Tighe (1994, p. 959) noted that '*individuals can simultaneously hold strong intrinsic and extrinsic orientations*' and that '*there is little support for the assumption that intrinsic and extrinsic motivation are polar opposites, with people falling into one discrete category or the other*'. In the same vein, Clycq, Nouwen, and Vandenbroucke (2014, p. 802) reported that '*almost every participant expressed both motivations at least to some extent*'. Also, Chemolli and Gagné (2014) found evidence against the continuum structure underlying motivation measures derived from Self Determination Theory.

In line with Self Determination Theory's perspective, this thesis supports the view of a single motivation continuum where intrinsic motivation and extrinsic motivation are mutually exclusive events that cannot happen at the same time. This view was adopted in order to understand the motivation diversity among different learners. This thesis argues for the need to extend the self-determination continuum to acknowledge the existence of different learners and the role of fear of failure within the learning environment. Figure 2.1 shows the self-determination continuum with types of motivation and types of regulation (Ryan & Deci, 2000).

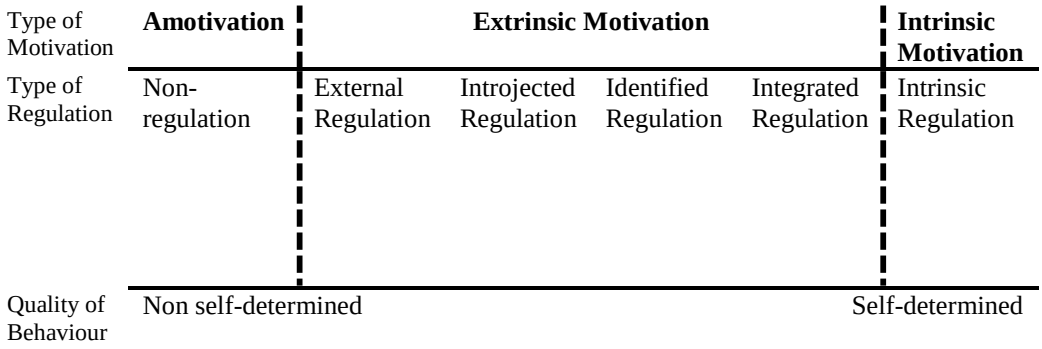


Figure 2.1 – The self-determination continuum, with types of motivation and types of regulation (Ryan & Deci, 2000).

Cluster analysis was used to explore combinations of motivation regulations within a sample of physical education students from the United States by Ullrich-French and Cox (2009). Their results identified five distinct combinations of motivation regulations including: self-determined; motivated; average motivated; low motivated; and external motivated. The self-determined and motivated students did not differ from one another on key motivation antecedents and consequences. The average and low motivated students were also similar on all variables except for physical activity behaviour and reported less positive physical education experiences than the self-determined and motivated students. Finally, the external students generally represented the least adaptive group on the motivation-related constructs. Group difference analyses showed that students with greater levels of self-determined forms of motivation, regardless of non-self-determined motivation levels, reported the most adaptive physical education experiences.

### 2.4.4 Factors Influencing Academic Motivation

Teachers often employ various techniques to motivate and engage students. They may choose to use fear appeals as a motivational tactic to stimulate fear that will result in students making greater efforts to avoid failure (see Putwain, Nakhla et al. (2016; 2017) and Nicholson, Putwain, Nakhla et al. (2018)). Teachers may also employ extrinsic incentives to engage students. Students, whether intrinsically or extrinsically motivated, engage in the work for either the desired reward of success or to escape the negative consequences of failure. Students may seek to avoid failure by either quitting or by trying hard to succeed (Pantziara & Philippou, 2015). In general, the willingness to engage in an activity seems dependent on the student's past experience with success or failure when performing a similar task.

Boström and Lassen (2006) explored how students' awareness of their preferred learning style and teacher-matched teaching affect students' learning and motivation. They argued that teaching based on individual learning styles is an effective way to ensure students' achievement and motivation. Similarly, Debdi, Paredes-Velasco, and Velázquez-Iturbide (2016) examined the relationships between teaching strategies, students' preferred learning style and motivation. They found that applying visual teaching strategies to verbal learners (who required written and verbal explanations), although not necessarily reducing their motivation, did not lead to the highest academic results. Similarly, applying sensory teaching strategies to intuitive students (who preferred principles, theories and innovation), did not reduce their motivation or lower their academic performance. Higgins (2013) argued that there is no direct benefit in matching teaching to students' preferred learning styles. He noted that it is more important for teachers to have a range of ways of presenting and explaining new ideas

and to explore various approaches that work for students within the learning environment. Higgins also noted the importance of making students responsible for finding a successful way of doing their own work.

Reviewing the literature has identified several factors that influence academic motivation; however, it has also highlighted a gap in examining fear of failure as a new influential factor of academic motivation. It is vital to discuss these factors in detail to gain insight into human behaviours. Moreover, these factors are interrelated and collectively contribute to informing our practice, aiming to ultimately improve student engagement which, in this study, is the outcome of motivation. These factors include the influence of: 1) external factors; 2) psychological needs; 3) personality orientation; 4) extrinsically motivated behaviours; and 5) students' approaches to studying.

**The Influence of External Factors**

External factors, such as rewards, praise, grades, scholarships and written feedback, impact on academic motivation as these tend to diminish feelings of autonomy and undermine intrinsic motivation (Heider, 1958; Deci & Ryan, 1985). The Cognitive Evaluation Theory (Deci & Ryan, 1985), which is part of Self Determination Theory, explains how and why external factors affect motivation. Ryan (1982) noted that external events can be viewed as having two functional aspects: a controlling aspect and an informational aspect.

Controlling external events, such as offering a reward in exchange for a compliant behaviour, or pressuring towards a specific outcome, facilitate the perception of an external locus for behaviour; hence, tending to diminish and undermine intrinsic

motivation. Informational external events, where the reward is offered to communicate competence or provide behaviourally relevant information in the absence of pressure for a particular outcome, increase intrinsic motivation. These events facilitate self-determined functioning and maintain intrinsic motivation (Deci & Ryan, 1985). Zuckerman, Porac, Lathin and Deci (1978) advocated that non-controlling external events, that provide choice in the task involved, tend to enhance feelings of autonomy, prompt a shift in the perceived locus, and provide the opportunity for intrinsic motivation to be maintained or enhanced.

On the other hand, Covington and Muller (2001) advocated that the availability of extrinsic rewards does not necessarily undermine interest in learning, but may actually enhance the prospects for learning more. They confirmed that these rewards reinforce the importance of learning and that it is the absence of these rewards that discourages caring about what one is learning.

**The Influence of Psychological Needs**

Satisfying the basic psychological needs of individuals is another important factor that influences academic motivation. The Basic Psychological Needs Theory (Deci & Ryan, 1985), which is part of Self Determination Theory, identified three innate basic psychological needs that are universal necessities. Satisfaction of these needs allow optimal human functioning, integrity and psychological wellbeing. However, if these needs are not fulfilled, a variety of non-optimal negative emotions of anxiety, grief, and hostility are evident as individuals revert to a state of passivity and ill-being (Ryan & Deci, 2000). These three needs are: autonomy, competence and relatedness.

Autonomy refers to the need of being the origin of one's own behaviours and one's own harmony with the integrated self (De Charms, 2013; Deci & Ryan, 1985). It also refers to the need to experience choice in the initiation and regulation of one's own behaviour (Luyckx, Vansteenkiste, Goossens, & Duriez, 2009). Competence refers to the need of being effective in one's own interactions with the environment. That is, seeking to control outcomes and experiencing mastery (White, 1959) as well as the need to succeed and be able to attain the desired outcomes (Luyckx, Vansteenkiste, Goossens, & Duriez, 2009). Relatedness is the need of feeling understood, cared for and respected by significant others (Baumeister & Leary, 1995). It also refers to establishing emotional bonds, a sense of respect, connectedness and responsive relationships (Luyckx, Vansteenkiste, Goossens, & Duriez, 2009).

Satisfaction of these basic psychological needs is essential for growth and integration as these determine and instigate the individual's behaviour in different situations (Deci & Ryan, 2000). Individuals internalise if they experience satisfaction of the needs for relatedness and competence; however, the satisfaction of the need for autonomy distinguishes if identification or integration, rather than just introjection, occur (Gagné & Deci, 2005).

**The Influence of Personality Orientation**

Discussing the impact of personality orientation is important to gaining insight into the motivation diversity among the different learners. According to the Causality Orientation Theory (Deci & Ryan, 1985), which is part of Self Determination Theory, students are different in how they motivate and engage themselves (Deci & Ryan, 1985; Koestner & Zuckerman, 1994). The theory hypothesises that everyone is, to some

degree, oriented in each of the three ways (autonomy oriented, control oriented and impersonal oriented) and that measuring the strength of each orientation will allow the prediction of relevant behaviours. Hence, there is a need to understand these orientations in order to predict relevant human behaviours within the learning environment.

Students who are autonomously oriented are described as having a generalised tendency towards a perceived internal locus, where they tend to seek out opportunities for self-determination through a high degree of choice and regulation of their own behaviour (Deci & Ryan, 1985). These students rely heavily on intrinsic motivation, integrated regulation and identified regulation (Reeve, 2012). Autonomously oriented students identify with the activity's value and their actions become self-endorsed. Therefore, they tend to be more self-determined, less controlled by extrinsic rewards, confident in their approach towards achievement, and attribute their success to ability (Deci & Ryan, 1985). They display greater self-esteem and self-awareness (Reeve, 2012), their behaviour is self-initiated and their choices are based on their awareness of one's own needs, values and personal goals rather than controls and constraints (Deci & Ryan, 2008).

Students who are control oriented rely heavily on external regulation (e.g. rewards or punishment), and introjected regulation (e.g. feelings of guilt or shame) as sources of motivation (Reeve, 2012). Control oriented students have a tendency to seek out controls either in the environment or inside themselves and to interpret those as controlling. In doing so, they seek to motivate themselves by relying on control-determined behaviours that are initiated by controls in the environment such as:

rewards, threats, inducements, expectations, prestige, financial advantage or deadlines (Deci & Ryan, 1985; Deci & Ryan, 2008). Since their behaviour is controlled rather than chosen, they tend to regulate their behaviour by orienting to external controls (Deci & Ryan, 2008); however, they sometimes rebel against those controls (Deci & Ryan, 1985). They also tend to display greater daily stress, and public self-consciousness (Deci & Ryan, 1985).

Students who are impersonally oriented are described as having an external locus of control. They experience tasks as being too difficult and outcomes as being independent of their behaviour, and therefore lack the intention to do differently (Deci & Ryan, 1985). Their behaviour is characterised by being amotivated, incompetent, inefficient, and helpless as they tend to have motivational deficits, low self-esteem and poor functioning (Deci & Ryan, 1985; Hodgins, Yacko, & Gottlieb, 2006; Koestner & Zuckerman, 1994; Vallerand, Deci, & Ryan, 1987). Impersonally oriented students have a tendency to perceive cues of failure, and a consequent belief that desired outcomes are unattainable because these outcomes are independent of their behaviour and are beyond their intentional control (Deci & Ryan, 1985; Hodgins, Yacko, & Gottlieb, 2006).

**The Influence of Extrinsically Motivated Behaviours**

Extrinsically motivated behaviours also influence academic motivation because these behaviours are enacted as a means to an outcome and are separate from being engaged in the task itself. That is, a student being engaged in the task to achieve a good grade or to please a teacher rather than enjoy the task itself. The Organismic Integration Theory (Ryan & Deci, 2000), which is part of Self Determination Theory, is concerned

with extrinsic motivation, as a differentiated construct. It recognises the various forms of extrinsic motivation (external regulation, introjected regulation, identified regulation, and integrated regulation) and specifies the antecedents, characteristics and consequences of each type (Ryan & Deci, 2000; Vansteenkiste, Niemiec, & Soenens, 2010) since each type is associated with different degrees of autonomous motivation.

External and introjected regulation are both associated with an external perceived locus and a sense of perceived obligation (controlled motivation). However, identified and integrated regulation are both associated with an internal perceived locus and a sense of perceived choice (autonomous motivation) (Vansteenkiste, Niemiec, & Soenens, 2010). Self Determination Theory recognises that these types of extrinsic motivation fall along a continuum of internalisation and that the more internalised the extrinsic motivation, the more autonomous the student will be when enacting behaviours (see Figure 2.1).

**The Influence of Students' Approaches to Studying**

Students' approaches to studying is another factor that influences academic motivation. Students' perception of the task they are undertaking reflects their past experiences with similar learning situations and involves their own perceptions of what it takes to learn (Säljö, 1975). The relation between students' motives to learning and the ways they go about learning contributes to the student's approach to studying (Marton & Säljö, 1976). Marton and Säljö (1976) distinguished surface level and deep level processing among students. They found that students adopted the surface level approach when they wanted to display symptoms of having learned, and adopted the deep level when they intended to extract maximum meaning by understanding. Marton and Säljö's (1976) findings showed that students would adopt either surface or deep levels of processing

in academic tasks according to their intentions when approaching the task. Similarly, Fransson's (1977) research linked students' approaches to learning with their motivation to learn. He found that strong interest and low anxiety produced a deep-level approach; however, lack of interest and high anxiety increased the tendency towards surface-level processing.

In Australia, Biggs (1976; 1987) examined the ways in which students go about learning and developed a theory of student learning. He also designed the Study Process Questionnaire to measure the extent to which individuals typically endorse common approaches to learning tasks. His factor analysis revealed three second order factors with each having a cognitive and a motivational component. Fear of failure emerged as a motivational component where students were alarmed with examinations and dominated by fear of failure. Relying on the same approach of cognitive psychology and study methods, Schmeck (1983) developed the Inventory of Learning Processes in the United States, while Entwistle and Ramsden (1983) designed the Approaches to Studying Inventory in England. Although three different instruments were developed to examine the learning strategies which students use in tackling their academic work, findings agreed on three common factors that describe the main differences in the ways students approach their studying. These were described as deep, surface, and strategic approaches to studying (Entwistle & Ramsden, 1983).

The deep approach is when learning is prompted by the student's intrinsic motivation and interest in finding out something new. It involves comprehension learning and active search for personal meaning. The surface approach is when the student's motivation is instrumental and where learning is initiated by external factors such as

rewards, grades or fulfilling the demands raised by others. It occurs when the students do not find the task they are working on motivating; hence, their main focus is on the task itself and not on what the task is about. In this approach, students tend to be syllabus bound and act to memorise texts because their interest in the task they are undertaking is blocked. This approach to learning is based on motives that are extrinsic such as fear of failure or keeping out of trouble (Sun & Richardson, 2016). The strategic approach is when the student's intention is to obtain the highest possible grades and is nurtured by the need for achievement (Entwistle & Ramsden, 1983). It includes organised study methods and achievement motivation.

Entwistle and Ramsden (1983) also pointed out that deep learning (meaning orientation) is having an internal focus on what is being learnt and on the experience of the student, while surface learning (reproducing orientation) is having an external focus on the learning task and on the demands of assessment. Meaning orientation was found to bring together the deep approach and comprehension learning with intrinsic motivation, while reproducing orientation linked the surface approach and improvidence with syllabus-boundness and fear of failure (Tait & Entwistle, 1996). Tait and Entwistle's (1996) results also indicated two different forms of motivation: need for achievement which involves being competitive and self-confident; and fear of failure which involves apprehension about assessment.

Biggs (1987) advocated that students' different approaches to learning encompassed different motivations. These included: extrinsic motivation, intrinsic motivation stemming from interest, intrinsic motivation which depended on self-esteem (Entwistle, Thompson, & Wilson, 1974), and idle or lack of motivation which represented the

absence of an approach to learning. Entwistle, Thompson, and Wilson (1974) linked intrinsic motivation/self-esteem to the achievement motivation or hope for success advocated by Atkinson and Raynor (1974). Fear of failure was another contrasting motivation that emerged from Entwistle, Thompson, and Wilson's (1974) findings and from their follow-up study (Entwistle & Wilson, 1977) where distinctive clusters of students were identified with these two different forms of motivation (hope of success and fear of failure). Entwistle et al.'s (1974; 1977) findings also associated fear of failure with lack of confidence and a high level of neuroticism.

### 2.4.5 The Modulatory Role of Motivation in the Literature

This section reviews the existing literature on the moderating and mediating role of extrinsic motivation in order to underpin the research questions posed. The moderating role of extrinsic motivation was examined by Sun and Choi (2009). They investigated if extrinsic motivation moderates the relationship between the Big Five personality factors (extraversion, agreeableness, conscientiousness, emotional stability, and openness to experience) and creative performance among undergraduate students at a North American business school. Their findings showed that advanced intrinsic and extrinsic motivation are critical moderators of the relationship between the Big Five factors and creativity. Extrinsic motivation was also found to be a meaningful moderator that changes the meaning of personal traits with regard to individual creativity.

In the same vein, De Feyter, Caers, Vigna, and Berings (2012) examined the moderating and mediating effects of academic motivation and self-efficacy. They proposed a theoretical model with conditional indirect effects of the Big Five personality factors on

academic performance through their impact upon academic motivation. Their findings revealed a positive indirect effect of neuroticism on academic performance at higher levels of self-efficacy, complemented by a positive direct effect of neuroticism at lower levels of self-efficacy.

The mediating role of autonomous and controlled motivation among athletes has been examined and confirmed by a number of researchers (Curran, Appleton, Hill, & Hall, 2011; Jowett, Hill, Hall, & Curran, 2013). Jowett, Hill, Hall, and Curran's (2013) results revealed that autonomous motivation and controlled motivation partially mediated the relationship between perfectionism and burnout. Perfectionistic concerns had a positive direct and indirect relationship with burnout via controlled motivation. In contrast, perfectionistic strivings had a negative direct and indirect relationship with burnout via autonomous motivation. Similarly, Curran, Appleton, Hill, and Hall's (2011) results revealed that self-determined autonomous motivation was found to fully mediate the relationship between harmonious passion and athlete burnout; however, no mediation was found in the case of obsessive passion and athlete burnout.

The mediating effects of the motivation regulations in conjunction with other constructs have been examined by a number of researchers (Appleton & Hill, 2012; Georgiadis, Biddle, & Chatzisarantis, 2001; Jeno & Diseth, 2014). Jeno and Diseth (2014) examined the mediating effect of autonomous self-regulation in relation to basic need satisfaction and perceived school performance among upper secondary school students. Their results showed that students' perceived autonomy-support predicted their need satisfaction, which in turn predicted autonomous self-regulation, perceived competence and perceived school performance. The relation between basic need satisfaction and

perceived school performance was fully mediated by autonomous self-regulation. Likewise, Appleton and Hill (2012) investigated the mediating effects of the motivation regulations in the relationship between socially prescribed and self-oriented dimensions of perfectionism and athlete burnout. Their results revealed that amotivation mediated the relationship between socially prescribed perfectionism and burnout symptoms. Amotivation and intrinsic motivation emerged as significant mediators of the relationship between self-oriented perfectionism and burnout symptoms.

The mediating role of self-determination continuum variables in the relationship between goal orientations and physical self-worth in Greek exercisers was examined by Georgiadis, Biddle, and Chatzisarantis (2001). Their results showed that the relationship between goal orientations and physical self-worth was mediated by the self-regulation continuum variables. Intrinsic and identified forms of regulation were found to strongly influence feelings of self-worth. This relationship weakened as the behaviour became more extrinsically regulated. Ego orientation was found to be related to extrinsic regulation, and predicted self-worth only through the internally regulated variables of intrinsic and identified regulation. The relationship between task orientation and self-esteem was mediated by one's self-determined motivational orientation.

### 2.4.6 Summary

Despite the way fear of failure has been portrayed in the literature, its influence on academic motivation and engagement has not been thoroughly examined by educational researchers. Reviewing the existing literature on the factors that influence academic motivation highlighted a gap in examining fear of failure as an influential factor of

academic motivation in the learning environment. Moreover, cluster analysis has been used to identify distinctive groups of students motivated by either hope for success or fear of failure (Entwistle & Wilson, 1977), and also used to identify distinct combinations of motivation regulations (Ullrich-French & Cox, 2009); however, it has not been used to examine the relationship between fear of failure and academic motivation. This thesis argues for the need to examine existing undergraduate populations of students in the United Kingdom for clusters based on fear of failure and academic motivation, and investigate engagement among students within these clusters.

Furthermore, although the self-determination continuum has been developed almost two decades ago (Ryan & Deci, 2000) it has not been extended to take into account the motivation diversity among different learners who are characterised in the literature. This study argues for the need to extend the self-determination continuum to acknowledge the existence of different learners and the role of fear of failure among them. Moreover, although the mediating effects of the motivation regulations have been examined by a number of researchers (Appleton & Hill, 2012; Georgiadis, Biddle, & Chatzisarantis, 2001; Jeno & Diseth, 2014) in the last two decades, the modulatory role of motivation regulations in the relationship between fear of failure and engagement has been completely missing from the literature. This thesis argues for the need to examine the modulatory role of extrinsic motivation, as a differentiated construct, in the relationship between fear of failure and student engagement. The aim is to extend the motivation literature by shedding light on the importance of using self-endorsed and self-imposed regulations to modulate the influence of fear of failure on student engagement.

## 2.5 Linking Learners to Motivation and Study Orientations

As discussed earlier, Self Determination Theory, which is a broad framework for the study of human motivation and personality, acknowledges that motivation is a differentiated construct and that its different regulations fall along a continuum. However, the Theory neither takes into account the motivation diversity among the different learners who are characterised in the literature nor their study orientations. It also does not acknowledge the role of fear of failure among these students.

### 2.5.1 Different Learners and Motivation

This section searches the existing literature on characteristics of different learners, based on their fear of failure, in order to link them to the motivation regulations identified by Self Determination Theory. The aim is not to label students or create stereotypes, because labelling students as a particular kind of learner is likely to undermine their belief that they can succeed through effort and provide an excuse for failure (Higgins, Kokotsaki, & Coe, 2012). However, the intention is to simplify reality by unfolding the unique characteristics of particular individuals in order to understand complex human behaviours within the diverse learning environment of which students are the prime contestants.

In our society, academic achievements often constitute important social signals in the labour and marriage markets; therefore, many students tend to equate their personal worth with their accomplishments. Atkinson (1957; 1964) proposed an approach–avoidance theory which explained how differences in the strength of achievement-related motives influence students' behaviour in achievement situations. He argued that achievement is a result of an emotional conflict between the motive to achieve and the

motive to avoid failure. Atkinson considered the achievement motive as a disposition to approach success and the avoidance motive as the capacity to experience pain in connection with negative consequences of failure.

Based on Atkinson's (1957; 1964) theory, Covington and Müeller (2001) presented a model which focused on the motivational pattern of different groups of students. Their model is based on the self-worth interpretation of need achievement. From the need achievement perspective, they associated students' reasons for learning with the distinction between approaching success and avoiding failure in achievement situations. From a self-worth perspective, they argued that students equate their self-worth with their academic achievements. Several researchers subsequently adapted Covington and Müeller's model to measure the influence of students' success orientation and fear of failure on self-handicapping, defensive pessimism and helplessness within Eastern and Western settings (De Castella, Byrne, & Covington, 2013; Martin, Marsh, & Debus, 2001a). Covington and Müeller's (2001) model classified students into: optimist students; overstrivering students; self-protecting students; and failure accepting students.

**Optimist Students**

Optimist students have a positive orientation towards their achievement and a proactive orientation to tasks (Covington & Omelich, 1991; Martin, Marsh, & Debus, 2001a). They are self-confident, resilient, have exemplary achievement behaviours (Covington & Omelich, 1991) and display greater self-esteem and self-awareness. Their achievements are appreciated because *'the reasons for grade-striving tend to serve a more task-oriented purpose'* since they *'benefit from the prospects of being graded for*

*their efforts'* (Covington & Müeller, 2001, p. 169). They are unlikely to contemplate failure or engage in defensive or self-protective behaviours (De Castella, Byrne, & Covington, 2013). Their behaviour is self-initiated and their choices are based on their awareness of one's own needs, values and personal goals. They experience autonomy, and have a sense of perceived choice over their actions. For these reasons, optimist students are expected to be intrinsically motivated, self-determined, have a high degree of choice and regulation of their own behaviour and are less controlled by extrinsic rewards.

Optimist students possess a proactive orientation to tasks, have good learning strategies, are keen to approach academic challenge with enthusiasm (Weinstein, Goetz, & Alexander, 1988) and therefore experience positive emotions as a result. They also have high levels of performance and a history of academic success which they attribute to their ability (Sansone & Harackiewicz, 2000). For these reasons, optimist students are expected to show overall engagement.

**Overstriving Students**

Overstriving students are driven simultaneously by an excessive fear of failure and a high approach to achievement. They are usually bright, hardworking, and meticulous, but because of their exceptional records of achievement are afraid of underperforming (Covington, 1992; Thompson & Parker, 2007). They lack confidence, have an unstable self-esteem (Covington, 1992; Martin, Marsh, & Debus, 2001a) and display greater daily stress, and public self-consciousness. Their fear, of not being as smart as their long history of success, drives them to pay attention to detail and seek effective study strategies (Covington & Omelich, 1991).

They have tendencies to seek out controls either in the environment or inside themselves and to interpret these as controlling. Overstriving students sustain their '*drive to succeed both by the temporary relief at having not failed (negative reinforcement) and by the positive sources of pride and intrinsic appreciation that accompany noteworthy achievements'* (Covington & Müeller, 2001, p. 170). For these reasons, overstriving students are expected to be extrinsically motivated (either integrated or identified regulation) because these are self-endorsed regulations which have a sense of personal commitment and self-awareness behind them. These regulations are close to intrinsic motivation in the degree of self-determination. Overstriving students consciously accept and value the outcomes and show willingness to transform their behaviour in order to achieve.

Overstriving students rarely procrastinate, as a single isolated failure could damage their academic successes and self-worth (Covington, 1992). They seek to avoid failure by succeeding (De Castella, Byrne, & Covington, 2013) and their achievement behaviour is driven by their fear of failure; hence, their accomplishments become an intolerable burden. As a result they tend to be highly anxious, exercise no self-forgiveness (Covington, 1992) and are at risk of emotional fatigue and burnout despite their outstanding achievement record (De Castella, Byrne, & Covington, 2013).

**Self-Protecting Students**

Self-protecting students are those characterised by high fear of failure and low approach to achievement. They lack resilience when faced with challenges (Covington, 1992; Martin, Marsh, & Debus, 2001a) and tend to be anxious and uncertain about their ability

to avoid failure or achieve success (Covington & Omelich, 1991). These students are overwhelmed with their fear of failing above and beyond their determination for success, hence aim to reduce its consequences by protecting themselves and consequently their self-worth (Covington, 1992). As a self-protective measure, they blame their poor performance on leaving things to the last minute (Covington, 1992), lack of effort or the way they are being taught rather than their lack of ability. They also use self-handicapping (Norem & Cantor, 1986) and defensive pessimism (Rhodewalt & Davison, 1986) to deflect the causes of failure and protect their self-worth.

These students are likely to engage in maladaptive self-protective behaviours that emerge from their beliefs about the mutability of their intelligence and serve to undermine their academic performance (De Castella & Byrne, 2015). Self-protective behaviours include the reduction of practice or revision before tests, procrastination (Rhodewalt & Davison, 1986), and setting unrealistically low expectations (Norem & Cantor, 1986). For these reasons, self-protecting students are expected to be extrinsically motivated (either introjected or external regulation), to comply with the self-imposed pressures and maintain their self-worth. Introjected regulation and external regulation are associated with an external perceived locus and a sense of perceived obligation (controlled motivation) (Vansteenkiste, Niemiec, & Soenens, 2010).

**Failure Accepting Students**

Failure accepting students are those who exhibit *'a relative absence of both approach and avoidance tendencies'* (Covington & Müeller, 2001, p. 170). They are

characterised by low self-esteem, incompetence, and helplessness as they tend to have motivational deficits, and poor functioning (Martin & Marsh, 2003). These students also have a tendency to recognise cues of failure, and a consequent belief that desired outcomes are unattainable and beyond their intentional control (Hodgins, Yacko, & Gottlieb, 2006). Anticipated repeated failures, which they attribute to their lack of ability, result in experiencing a complete loss of control over events and feelings of hopelessness (Covington, 1992). Threatening failure-acceptors by *'raising grade stakes will do little to arouse extra effort, nor will offering positive reinforcements particularly enhance task engagement'* (Covington & Müeller, 2001, p. 170). As a result, they experience emotional withdrawal from academic work and reject both the goals and the means to achieve them. Failure accepting students see little relevance to life in academic work, lack resilience, motivation and show cognitive and behavioural disengagement (Martin & Marsh, 2003). For these reasons, failure accepting students are expected to be amotivated and disengaged.

### 2.5.2 Motivation and Study Orientations

This section searches existing literature for links between motivation of different learners, and their study orientations. Study orientations refer to how students approach studying. Students' motivation was found to be an important factor in influencing their choice of approach to studying. Fransson (1977) confirmed that threat in the form of extrinsic motivation, anxiety and the absence of intrinsic motivation were associated with surface approaches to studying, while intrinsic motivation and the absence of both extrinsic motivation and anxiety was associated with a deep approach to studying. Fransson's (1977) findings also revealed that when students showed limited interest in

what they were learning, they adopted a surface approach; however, when they were intrigued by the relevance of what they were learning, they adopted a deep approach.

Students' approaches to studying were also found to be linked to their intentions and motives to learning. Marton, Hounsell, and Entwistle (1984) argued that learning out of interest that is due to intrinsic motivation is expected to be linked to a deep approach to learning. In the same vein, Entwistle's (2009) findings revealed that when students were intrinsically motivated they adopted a deep approach to studying because their intentions were supported by a sophisticated conception of learning. Researchers (Biggs, 1987; Entwistle & Ramsden, 1983; McCune & Entwistle, 2011) agreed that students with an internal locus of control tend to use the deep approach which is linked to broadening knowledge and skills. These students are inclined to understand for themselves, have adequate prior knowledge to link new ideas and the necessary reasoning ability to make sense of those links (Entwistle, 2009). For these reasons, a deep approach to studying and intrinsic motivation are linked to optimist students.

Counter-wise, the motive of fulfilling the demands raised by others in the form of extrinsic motivation seemed to be associated with surface approaches to learning (Marton, Hounsell, & Entwistle, 1984). This approach stems from the lack of interest in the subject and is independent of the amount of effort that students put into studying. It is associated with rote learning and reproducing material, which then develops into a habitual way of learning causing a damaging effect on studying (Entwistle, 2009). A surface approach was found to be associated with higher levels of anxiety and fear of failure as the students begin to feel demoralised when their repeated attempts at studying fail to meet the academic requirements. This consequently results in students making

less effort in studying as their interest and self-confidence drains away (Entwistle, 2009).

Researchers (Biggs, 1987; Entwistle & Ramsden, 1983; McCune & Entwistle, 2011) agreed that students with an external locus of control (i.e. linked to grades and qualifications) tend to use the surface approach which is related to instrumental forms of motivation and fear of failure. For these reasons, overstriving and self-protecting students are linked to extrinsic motivation and surface approaches to studying.

### 2.5.3 Summary

Reviewing existing literature on characteristics of different learners revealed that researchers (Atkinson, 1957; 1964; Covington & Müeller, 2001; De Castella, Byrne, & Covington, 2013) have categorised learners based on the self-worth interpretation of need achievement. Surprisingly, there was no reference to link different learners to their motivation and study orientations in light of Self Determination Theory. This thesis argues for the need to extend the self-determination continuum to acknowledge the existence of different learners and the role of fear of failure among them, using existing literature.

## 2.6 Student Engagement and Disengagement

Schussler (2009) framed engagement from the perspective of a group of students attending an alternative high school designed for disengaged students who possess academic potential. Schussler advocated that engagement in learning involves formulating a deeper connection between the student and the material and argued that teachers can create an environment conducive to intellectual engagement. Schussler's

results suggested that effective classroom management and teaching that supports intellectual engagement are inextricably linked. Effective teaching has been defined as '*that which leads to improved student achievement using outcomes that matter to their future success*' (Coe, Aloisi, Higgins, & Major, 2014, p. 2). The authors (Coe, Aloisi, Higgins, & Major, 2014, p. 43) argued that how teaching leads to learning is a very complex matter and that '*teaching will always be more of an art than a science, and that attempts to reduce it to a set of component parts will always fail'*.

Researchers have noted that the literature on student engagement is a '*mixed bag*' (Trowler, 2010, p.9). They have described student engagement as a '*meta*' and '*multidimensional*' construct (Fredricks, Blumenfeld, & Paris, 2004, pp. 60-61) and confirmed its significant inverse relationship with fear of failure (Caraway, Tucker, Reinke, & Hall, 2003). Researchers have called for the need to develop a broader understanding of the construct of student engagement in higher education and a robust theorisation of this concept (Krause & Coates, 2008). Therefore, a clear understanding of the definitions, typologies and dimensions of this broad and complex construct is important to help establish its relationship with fear of failure and academic motivation.

### 2.6.1 Defining Student Engagement and Disengagement

Student engagement has been described as the '*current buzzword in higher education*' (Kahu, 2013, p. 758) and the focus of attention to '*enhance learning and teaching in higher education*' (Trowler, 2010, p. 2). Theorists have attempted to define engagement from different educational perspectives. One perspective highlighted the important role that engagement played in measuring and predicting educational outcomes (Reschly & Christenson, 2012). In this case, it was defined as '*the extent to which students are*

*engaging in activities which higher education research has shown to be linked with high quality learning outcomes*' (Krause & Coates, 2008, p. 493). In the same vein, Hu and Kuh (2002, p. 3) defined engagement as the '*quality of effort students themselves devote to educational purposeful activities that contribute directly to desired outcomes*' and Lam et al. (2014, p. 215) defined it as the '*process that mediates the effects of the contextual antecedents on student outcomes*'.

From a psychological perspective, student engagement was defined by Newmann (1992, p. 12) as the '*student's psychological investment in and effort directed toward learning, understanding, mastering the knowledge, skills or crafts that the academic work is intended to promote*'. Likewise, engagement was also defined as the quality of a student's active connection or involvement in their work (Skinner, Kindermann, & Furrer, 2009). Another perspective recognised academic engagement from the meaningful interactions that students have with their universities and the quality of university education on student learning (Astin, 1985; Kuh, Douglas, Lund, & Ramin-Gyurnek, 1994; Love & Love, 1995). Coates (2007, p. 122) argued that student engagement plays a role in quality assurance and provides useful information to '*evaluate and manage the quality, nature, levels and targeting of resource provision*'. Despite the various attempts to define engagement, Lester (2013, p. 2) highlighted that it is still loosely defined and that '*a unified definition of engagement has not congealed*'.

The perspective adopted in this study was that engagement is the measure of students' intrinsic involvement in the learning and key educational processes. In other words, this study examined engagement that arises out of being motivated, that is, engagement as an outcome of academic motivation. Put differently, academic motivation is the

'*relatively more private, subjectively experienced cause, while engagement is the relatively more public, objectively observed effect*' (Reeve, 2012, p. 151). Adopting this view helps to establish the direct and indirect effects of fear of failure on student engagement. It also helps to establish the modulatory role of extrinsic motivation in predicting engagement.

Disengagement has been defined as the '*absence of engagement including the absence of effort or persistence*' (Skinner, Kindermann, & Furrer, 2009, p. 495). This perspective was adopted in my study because it works in harmony with the motivation continuum of Self Determination Theory, which is the framework of this study. This view considers disengagement as the opposite of engagement, with lower levels of engagement indicating disengagement.

### 2.6.2 Typologies of Student Engagement

This section lists a number of typologies of student engagement and the reasons for not selecting them, before a justified discussion of the typology adopted and used in this study is presented. Coates (2007) proposed a typology of student engagement which included four styles of engagement that '*refer to transient states rather than student traits*' (p. 132). The intense style of engagement is where students see their learning environment as responsive, supportive and challenging. The independent style of engagement is where students tend to be less likely to work collaboratively with other students. The collaborative style of engagement is where students feel validated within their learning environment and interact with staff and other students. Finally, the passive style of engagement is where students indicate passive styles of engagement and rarely participate in productive learning. Coates's (2007) typology was more

focused around the behavioural and agentic dimensions of engagement and fails to take into account other vital dimensions such as the performance and emotional dimensions of engagement. Moreover, there is no instrument to measure Coates's (2007) dimensions; hence it was not selected for this study.

The assumption that different types of engagement produce different types of student commitment and responses was used by Schlechty (2011) to explain student engagement. His typology characterised classrooms in terms of the patterns of students' observed engagement. Schlechty identified five types of observed responses that students make to any assigned activity. Authentic engagement is where the student is interested in the assigned activity and sees immediate and clear value in it (e.g. solving a problem of real interest to the student). Ritual engagement is where the student finds the assigned activity of no value and associates the activity to extrinsic outcomes that are of value (e.g. reading a book to pass a test). Passive compliance is where the student sees little value of the assigned activity but is willing to put in the effort needed to avoid the negative consequences. Retreatism is where the student puts no energy in attempting the activity, becomes disengaged and acts in ways to disrupt others. Finally, rebellion is where the student refuses to do the assigned task.

Schlechty advocated that retreatism may be a resting point for a student who is otherwise authentically engaged throughout the assigned activity. He also argued that students who are ritually engaged are not necessarily less engaged than those who are authentically engaged; however, they are engaged for a different set of reasons. Schlechty's typology does not clearly differentiate between students' motivation and

engagement. This thesis examined engagement as an outcome of academic motivation; therefore Schlechty's typology was not selected.

Another typology included four distinct perspectives (behavioural, psychological, socio-cultural and holistic perespectives) of engagement and had the student at its centre (Kahu, 2013). The behavioural perspective focuses on student behaviour and teaching practice. The psychological perspective views engagement as an internal individual process that evolves over time and varies in intensity. The socio-cultural perspective considers the impact of the social context on student experience. Finally, the holistic perspective draws on the diverse strands of theory and research on student engagement. Kahu's (2013) typology failed to include factors that indicate students' active pursuit of learning; hence, this typology was not selected for this study.

The dynamics of relationships in the classroom were examined by Furrer, Skinner, and Pitzer (2014) through the lens of a motivational model that supported Self Determination Theory. This model has both engagement and copying at its core and assumes that students come to the learning environment with a wellspring of intrinsic motivation and the capacity to take responsibility for their own learning. This typology advocated that both staff and students are social partners who can meet or undermine these psychological needs through three pathways. These are: relatedness which is promoted by warmth or undermined by rejection; competence which is promoted by structure or undermined by chaos; and autonomy which is promoted by autonomy support or undermined by coercion (Furrer, Skinner, & Pitzer, 2014). This thesis aimed to examine students' skills, emotional, participation and performance engagement in relation to fear of failure; hence Furrer et al.'s typology was not used.

The conceptualisation of engagement used in this study was the one advocated by Handelsman, Briggs, Sullivan, and Towler (2005). They posited four facets that relate to students' engagement: skills engagement (which represented student engagement through practicing skills); emotional engagement (which represented student engagement through emotional involvement with the class material); participation/interaction engagement (which represented student engagement through participation in class and interactions with instructors and other students); and performance engagement (which represented student engagement through levels of performance in the class).

Handelsman, Briggs, Sullivan, and Towler (2005) focused on the 'micro' level, which they identified as what happens in and surrounding class. They based their investigation on other research finidings which advocated that students do not spend much time studying outside class. Hence, they hypothesised that student engagement would be related to two types of self-reported engagement: absolute engagement, which represents students' engagement in their present course; and relative engagement, which represents students' engagement in relation to other courses. They developed the SCEQ instrument which is a 23-item instrument with four subscales, two to measure outcomes of engagement (these are: skills engagement, and performance engagement) and two to measure indicators of engagement (these are: participation/interaction engagement and emotional engagement).

This typology was selected and used in this study because these factors make not only intuitive sense as indications of a student's active pursuit of learning, but are grounded in theories of motivation, self, and mastery/performance orientations by students

(Dixson, 2010). Furthermore, Handelsman, Briggs, Sullivan, and Towler (2005) called for the validation of their SCEQ instrument and for focusing on the relation of this measure with other constructs in order to identify the antecedents of student engagement. Hence, there are positive reasons behind validating this instrument and linking it with other constructs such as fear of failure and academic motivation.

### 2.6.3 Dimensions of Student Engagement

In this section, the four dimensions of engagement adopted in this study are explained. These are: skills engagement, performance engagement, emotional engagement and participation engagement. Skills engagement represents student engagement through practicing skills and referred to the skills students use and the strategies they employ to master their work. It also involves the degree of being actively involved in the learning activity through attendance and involvement which includes effort, persistence, and concentration. Performance engagement represents student engagement through levels of performance in the class and refers to using sophisticated learning strategies to engage in higher level thinking leading to deeper understanding and learning. It also refers to getting high grades, doing well on tests and being confident in ability to learn and perform well.

Emotional engagement represents students' engagement through emotional involvement with the class material and refers to the affective reaction in the classroom. This includes the presence of task-facilitating emotions such as interest, happiness, enjoyment and a sense of belonging as well as the absence of task withdrawing emotions (Skinner & Belmont, 1993). It involves students' sense of belonging and the degree to which students feel and care about their course (Sciarra & Seirup, 2008).

Participation/interaction engagement represents student engagement through participation in class and interactions with instructors and other students.

Finn, Fulton, Zaharias, and Nye (1989) conceptualised participatory behaviours in terms of three levels initiated by the student. The basic level involves their positive conduct, such as following rules and adhering to norms; the next level involves their persistent participation in learning, and contribution to class discussion; and the final level involves participation in social extracurricular activities (Finn, Fulton, Zaharias, & Nye, 1989). Buhs and Ladd (2001) divided classroom participation into cooperative participation, which is considered as an observed behaviour, and autonomous participation which is regarded as a form of self-directed behaviour.

## 2.7 Problem Statement

Fear of failure has been described as an impediment to success and one that shapes students' expectations and behaviours (Cox, 2009). In education, it is powerful, pervasive (Jackson, 2010), counterproductive (Cox, 2009) and is associated with a number of aversive consequences (Conroy, 2001). Fear of failure was also found to be related to slow information accumulation, and reduced learning rates during tasks (Lerche, Neubauer, & Voss, 2018). However, there has been little effort on exploration of fear of failure or examining its links with other constructs such as academic motivation, and student engagement. Researchers (e.g. Jackson, 2010) have called for the need to focus more attention on how fear operates in education.

Moreover, although Self Determination Theory is interested in human motivation and personality, it does not anticipate the factors that influence academic motivation. It fails

to acknowledge that when students are afraid of failing, they display certain behaviours that impact on their academic motivation. It also fails to take into account the motivation diversity among different learners identified in the literature. This thesis argues for the need to examine existing undergraduate population of students for clusters based on fear of failure and academic motivation, and investigate student engagement within these clusters. It also argues for the need to extend the self-determination continuum to acknowledge the existence of the different learners and the role of fear of failure among them, based on existing literature.

Although the construct of academic motivation has been studied from several perspectives in the last two decades, reviewing factors that influence students' motivation highlighted the unrecognised influential role of fear of failure on academic motivation. Moreover, the role of extrinsic motivation in the relationship between fear of failure and student engagement has been missing from the literature. This thesis argues for the need to examine fear of failure as a new influential factor of academic motivation and student engagement. It also argues for the need to examine the modulatory role of extrinsic motivation, as a differentiated construct, in the relationship between fear of failure and student engagement. Focusing on the diverse and often contradictory ways that fear operates in education helps in gaining insight into the complexity of the classroom environment in light of the complex nature of human behaviours.

Reviewing the literature also emphasised some of the calls made by other researchers. Several researchers made explicit calls to further investigate the structural component of the AMS scale (Cokley, Bernard, Cunningham, & Motoike, 2001; Fairchild, Horst,

Finney, & Barron, 2005; Guay, Morin, Litalien, Valois, & Vallerand, 2015), and the SCEQ (Handelsman, Briggs, Sullivan, & Towler, 2005). Given the explicit calls made by researchers, this thesis argues for the need to examine the factor structure of self-reported instruments when used as part of data collection in order to be confident that these instruments truly measure what they intended to measure.

## 2.8 Chapter Summary

This chapter introduced Self Determination Theory as the framework of this study and argued for the need to extend the self-determination continuum to acknowledge the existence of different learners and the role of fear of failure among them based on existing literature. The small body of existing literature on fear of failure was searched and the limited exploration of theorising fear of failure in education or examining its links with motivation, and engagement was noted. This chapter also searched the literature on academic motivation and noted that although academic motivation has been a topic of interest to researchers for the last two decades, the modulatory role of extrinsic motivation in the relationship between fear of failure and engagement has been missing. Factors influencing academic motivation were highlighted and the need for examining fear of failure as an influential factor on academic motivation was argued.

Additionally, this chapter searched the literature on characteristics of different learners and argued for the need to examine undergraduate student population for clusters based on fear of failure and academic motivation, and investigate student engagement among these clusters. The need to examine the factor structure of self-reported instruments when used as part of data collection was highlighted. Finally, the literature on student engagement was searched and researchers' calls to develop a broader understanding and

a robust theorisation of this concept was noted. Different typologies and dimensions of student engagement in the existing literature were discussed and the one used in this study was presented.

The next chapter discusses the methodology and methods used to screen and analyse data in this study.

# Chapter 3 Methodology and Methods

## 3.1 Chapter Overview

This chapter discusses the research paradigm, including: the theoretical stance taken; epistemology; methodology; and study design. It describes data collection procedures and methods chosen for data screening and data analyses. The General Linear Model, which is the foundation framework for several statistical tests, is used to answer the research questions. It includes: structural equation modelling; path analysis; correlation; independent samples *t*-test; cluster analysis; moderation analysis; and mediation analysis. Ethical considerations and a summary of how power is used to set and evaluate this study, are also discussed.

## 3.2 Research Paradigm

The choice of paradigm was driven by the research questions and the nature of the social phenomenon under investigation (Morgan & Smircich, 1980), which is fear of failure, warranting a quantitative approach. As suggested by Crotty (1998), four key aspects were considered in developing this research proposal. These were: the epistemology; the theoretical perspective; the methodology; and the methods employed.

### 3.2.1 Epistemology

The objectivist's stance taken warranted a quantitative approach, to measure the influence of the social phenomenon of fear of failure and to analyse data in a range of different ways. One advantage of this approach is that I, the researcher, and the students participating in my research are conceived of independent entities that had no direct or indirect influence on each other, hence minimising intrapersonal linking and

subjectivity of findings of this research. According to Carr (1994) findings of quantitative research are likely to be generalised because of having a large sample which is randomly selected and representative of the population. The availability of various statistical software to conduct the analyses is yet another advantage of this approach.

### 3.2.2 Theoretical Perspective

A post-positivist approach to the theoretical perspective aimed to investigate the relationship between fear of failure, academic motivation and student engagement. The approach taken tested the relationship between the observed variables (these are the items in the AMS and SCEQ instruments), and their underlying latent constructs (these are academic motivation and engagement). According to Rahman (2017, p. 102) '*the positivistic researchers' belief is that the social world consists of concrete and unchangeable reality which can be quantified objectively*'. Post-positivism aims to use science to gain an understanding of the world, hence being able to predict it using quantitative methods (Creswell, 2008; Willis, 2007). The post-positivist lens was selected to carefully measure the reality that exists and recognise the extent of being positive about claims of knowledge (Creswell, 2002) when studying human behaviours.

### 3.2.3 Methodology and Study Design

Given the nature of the constructs under investigation, the post-positivist approach adopted, and the research questions posed, the quantitative approach was the most logical and appropriate methodology to use. The approach taken aimed to conceptualise reality in terms of variables and establish relationships between them (Punch, 2005) in order to interpret and describe social realities (Bassey, 1995; Cohen, Manion, & Morrison, 2002). On the application level, quantitative research is most commonly

associated with the use of self-reported questionnaires. Three predetermined instruments for measuring the three constructs under investigation (which are fear of failure, academic motivation, and engagement) were used to yield the required statistical data using a sample of undergraduate students.

The decision to revalidate and use existing instruments to yield the required statistical data rather than develop new instruments was based on a number of reasons. As discussed earlier (see section 1.6), a number of researchers (Cokley, Bernard, Cunningham, & Motoike, 2001; Fairchild, Horst, Finney, & Barron, 2005; Guay, Morin, Litalien, Valois, & Vallerand, 2015; Handelsman, Briggs, Sullivan, & Towler, 2005) have explicitly called to further examine both the AMS scale and the SCEQ scale. Therefore, I had to be confident that these self-reported instruments truly measure what they intended to measure as this might jeopardise the confidence in the findings of this study. Moreover, revalidating existing instruments is a practical and cost-efficient way to collect the information needed from a large number of participants in a relatively short period of time. Also, in the last two decades the constructs of academic motivation and student engagement have been thoroughly examined by a large number of researchers; hence, it was logical and appropriate to extend existing knowledge rather than reinvent this knowledge.

### 3.3 Data Collection

The data were collected via online and paper and pencil self-reported questionnaires using three instruments specifically designed to measure the three constructs under investigation. To minimise bias from influencing the outcomes of this study, both online questionnaire and paper and pencil questionnaire were identical copies of each

other. Although researchers (De Looij-Jansen, Petra, & De Wilde, 2008; Denscombe, 2006; Ritter, Lorig, Laurent, & Matthews, 2004) have reported no or very few differences between online and paper and pencil questionnaires, it was still essential to investigate if both methods would produce similar results. Statistical comparisons were made between online and paper and pencil versions of the questionnaires for each of the three instruments used to collect the data. Statistical comparisons included: descriptive statistics; independent samples *t*-tests to compare the mean scores; effect size; and Cronbach's alpha coefficient to test for internal consistency and reliability of both online and paper and pencil methods. The aim was to examine if the responses made by the respondents were affected by the method used to collect data.

The three instruments were combined to form one questionnaire which is included in Appendix One. Table 3.1 summarises the instruments used in this study, their subscales and the number of items used to measure each subscale. In addition, a set of demographic questions were asked for the purpose of sample description. Participants were asked to report their gender, age, qualifications, the course they are enrolled on, their year group and ethnicity. Issues of common method variance arising from using a common rater (questionnaire) are discussed in detail later in this chapter.

The questionnaires were administered to a sample of undergraduate students at one higher education institution in the United Kingdom. Participants were contacted through the university's Virtual Learning Environment (VLE), e-mail system and using direct contact. Thus, the number of participants who were actually contacted is unknown, as is, consequently, the response rate. Where contact was made online, a link

to a copy of the participants' consent form and information sheet were included (a copy is included in Appendix Two). Reminder e-mails were sent out to non-respondents.

Table 3.1 – The constructs under investigation, and the instruments used

| Construct | Instrument | Source | Subscales | Number of Items |
|---|---|---|---|---|
| Fear of failure | The Performance Failure Appraisal Inventory (PFAI – S) | Conroy, Willow & Metzler (2002). | Fear of experiencing shame and embarrassment | 1 |
| | | | Fear of devaluing one's self-estimate | 1 |
| | | | Fear of having an uncertain future | 1 |
| | | | Fear of important others losing interest | 1 |
| | | | Fear of upsetting important others | 1 |
| Academic Motivation | Academic Motivation Scale (AMS) | Vallerand, Blais, Brière, & Pelletier (1989). | Intrinsic Motivation – to know | 4 |
| | | | Intrinsic Motivation – toward accomplishment | 4 |
| | | | Intrinsic Motivation – to experience stimulation | 4 |
| | | | Extrinsic Motivation – Identified Regulation | 4 |
| | | | Extrinsic Motivation – Introjected Regulation | 4 |
| | | | Extrinsic Motivation – External Regulation | 4 |
| | | | Amotivation | 4 |
| Engagement | Student Course Engagement Questionnaire (SCEQ) | Handelsman, Briggs, Sullivan & Towler (2005). | Skills Engagement | 9 |
| | | | Performance Engagement | 3 |
| | | | Emotional Engagement | 5 |
| | | | Participation/interaction Engagement | 6 |

### 3.3.1 The Performance Failure Appraisal Inventory (PFAI – S)

The PFAI – S, which is an instrument to measure fear of failure, was developed by Conroy, Willow, and Metzler (2002). It only consisted of five questions that were linked to five aversive consequences of failing. These were: fear of experiencing shame and embarrassment; fear of devaluing one's self-estimate; fear of having an uncertain future; fear of losing social influence; and fear of upsetting important others (Conroy, Willow, & Metzler, 2002). This instrument was chosen to measure fear of failure because it acts in harmony with the conceptualisation of fear of failure adopted in this study. In this study fear of failure in education was conceptualised as how an individual orientates to the consequences of failing, that serves as an antecedent variable to shape and influence their motivation and engagement. It was therefore logical to operationalise fear of failure from the perspective of its fierce consequences, in order to establish its influence on academic motivation and engagement. Furthermore, its authors confirmed that this instrument showed strong factorial validity and its internal consistency exceeded conventional criteria ($\alpha = 0.72$).

Responses were made on a five-point Likert scale ranging from '*do not believe at all*' (–2) to '*believe 100% of the time*' (+2). These responses were then scored from 1 (representing –2) to 5 (representing +2). The total score was calculated, using SPSS software (version 25.0) (IBM Corp., 2019), for each participant and used in the analysis. Responses were expected to range from a minimum value of 5 (which represents a participant with low fear of failure) to a maximum value of 25 (which represents a participant with maximum fear of failure).

### 3.3.2 The Academic Motivation Scale (AMS)

The AMS scale, which is an instrument for measuring academic motivation, was developed by Vallerand, Blais, Brière, and Pelletier (1989). This instrument was selected because its subscales were designed to evaluate Self Determination Theory as theorised by Deci and Ryan (1985; 2000), which is the theoretical framework of this study. The AMS was slightly modified to fit in with the English higher education system. The instrument consists of 28 statements in response to an initial question '*Why do you go to university?*' It measures three types of intrinsic motivation: to know (e.g. because I experience pleasure and satisfaction while learning new things), to accomplish (e.g. for the pleasure I experience while surpassing myself in my studies), and to experience stimulation (e.g. for the pleasure that I experience when I read interesting authors); three types of extrinsic motivation: identified regulation (e.g. because eventually it will enable me to enter the job market in a field that I like), introjected regulation (e.g. to prove to myself that I am capable of completing my university degree), external regulation (e.g. in order to have a better salary later on); and amotivation (e.g. I once had good reasons for going to university, however, now I wonder whether I should continue).

Responses were made on a seven-point Likert scale ranging from '*does not correspond at all*' (1) to '*corresponds exactly*' (7). The total score for each subscale was calculated, using SPSS software (version 25.0) (IBM Corp., 2019), for each participant and used in the analysis. Given that there were seven subscales in this instrument and that each subscale consisted of four items, responses were expected to range from a minimum value of 4 to a maximum value of 28.

The authors of the instrument confirmed its high internal consistency that ranged from 0.83 to 0.86, with the exception of the identified subscale of extrinsic motivation that showed an internal consistency of 0.62. They also found evidence to support the existence of the simplex pattern, that is, having stronger correlations between the adjacent types of motivation than between types that are farther apart on the motivation continuum. In addition, the authors reported that intrinsic motivation should be negatively correlated with amotivation as they are at opposite ends of the continuum. With regard to the scale's psychometric characteristics, its authors confirmed the seven-factor structure. However, a number of researchers reported several inconsistencies, including possible overlap between the intrinsic and extrinsic motivation subscales, and therefore called for further investigations regarding its construct validity (Cokley, Bernard, Cunningham, & Motoike, 2001; Fairchild, Horst, Finney, & Barron, 2005; Guay, Morin, Litalien, Valois, & Vallerand, 2015). Hence, it was necessary to test the factor structure of the AMS scale.

### 3.3.3 The Student Course Engagement Questionnaire (SCEQ)

The SCEQ instrument, which is an instrument for measuring engagement, was developed by Handelsman, Briggs, Sullivan, and Towler (2005). Originally, this instrument consisted of 27 statements; however, after confirmatory factor analysis by its authors, it was reduced to 23 items in response to an initial question '*To what extent do the following behaviours, thoughts, and feelings describe you, in this course?*' The instrument consists of four subscales (skills, emotional, participation/interaction and performance engagement) that were found to relate to student engagement. Skills engagement represents student engagement through practicing skills and educationally relevant behaviours that students initiate to advance their academic work (e.g. making

sure to study on a regular basis). Emotional engagement reflects student engagement through emotional involvement with the class material and how they think about what they learn outside of class and use it in their everyday life (e.g. applying course material to my life). Participation/interaction engagement refers to student engagement through participation in class and interactions with instructors and other students (e.g. participating actively in small-group discussions). Performance engagement encompasses students' feelings of competence in evaluation situations and their satisfaction with their grades (e.g. getting a high grade).

The instrument was slightly modified to fit in with the English higher education system where the wording of one statement was adjusted from '*asking questions when I don't understand the instructor*' to '*asking questions when I don't understand*'. Responses were made on a five-point Likert scale ranging from '*not at all characteristic of me*' (1) to '*very characteristic of me*' (5). The total score for each of the four subscales was calculated, using SPSS software (version 25.0) (IBM Corp., 2019), for each participant and used in the analysis. The skills engagement subscale had nine items (responses per participant were expected to range from 9 to 45), the emotional engagement subscale consisted of five items (responses per participant were expected to range from 5 to 25), the participation engagement subscale consisted of six items (responses per participant were expected to range from 6 to 30), and the performance engagement subscale consisted of three items (responses per participant were expected to range from 3 to 15). The authors of the instrument confirmed its high internal consistency that ranged from 0.76 to 0.82.

As discussed in chapter 2, although researchers agreed that student engagement is a multidimensional construct, there were inconsistencies in the way they conceptualised it. Some researchers (Christenson, Reschly, & Wylie, 2012; Fredricks, Blumenfeld, & Paris, 2004) measured student engagement in terms of behavioural engagement, emotional engagement, and cognitive engagement; however, Reeve and Tseng (2011) argued for the inclusion of agentic engagement, and Reschly and Christenson (2006) argued for the inclusion of academic engagement. Nonetheless, this instrument was chosen because its four subscales are indicators of students' active pursuit of learning with two of its subscales assessing engagement outcomes (skills engagement and performance engagement) and the other two assessing engagement indicators (participation/interaction engagement and emotional engagement).

### 3.4 Methods of Data Screening

Data screening involved inspecting the raw data for errors in preparedness for conducting the appropriate statistical tests. This process involved: dealing with missing data; detecting normality issues; dealing with outliers; homoscedasticity; and multicollinearity.

#### 3.4.1 Missing Data

It was essential to ensure that the data collected were clean and valid before conducting any statistical tests (Osborne & Overbay, 2008). Data entry was verified using descriptive statistics, which included frequencies, minimum and maximum, mean and standard deviation. The expected maximisation algorithm (Laird, 1988; Rudd, 1991), which is an iterative process, was used to estimate the missing data (Moon, 1996) in this study. The algorithm uses iteration to estimate missing data and calculate

parameters using the maximum likelihood. The iteration is repeated to re-estimate the missing data based on the new parameter estimates, and then recalculates the new parameter estimates based on re-estimated missing data (Little & Rubin, 2014) until there is convergence in the parameter estimates (Roth, 1994; Tsikriktsis, 2005). By doing so, the calculated imputation preserves the relationship between the variables, which is crucial to this study, as it is examining the relationships among a set of variables.

### 3.4.2 Normality and Outliers

Normality refers to the distribution of the data for a particular variable. The data need to follow a normal distribution in order for most analyses to work properly. Normality is assessed using: shape, skewness, and kurtosis. Data distribution with either a highly skewed nature or with high kurtosis is indicative of non-normality, which may exist due to the presence of outliers in the data (Osborne & Overbay, 2004).

Outliers are cases whose scores are substantially different from all the others in a particular set of data. Kline (2005) defined them as cases whose values are more than three standard deviations beyond the mean. One way of detecting outliers is by computing Mahalanobis distance and comparing it to the $\chi^2$ distribution of the same degrees of freedom. Mahalanobis distance indicates the distance in standard deviation units between a set of scores (vector) for an individual case and the sample means for all variables (centroid), correcting for inter-correlations (Kline, 2005). A conservative computed level of significance of $p$ value <0.001 is usually recommended for this test.

### 3.4.3 Homoscedasticity and Multicollinearity

Homoscedasticity and multicollinearity are aspects of multivariate normality (Kline, 2005). Homoscedasticity refers to the assumption that the variance around the regression line is the same for all values of the predictor variable (McCulloch, 1985). Multicollinearity exits when one of the predictor variables is in linear combination of the other predictor variables (O'Brien, 2007). If multicollinearity exists, it can inflate the variance of regression parameters and lead to the wrong identification of the relevant significant predictors. It is assessed using Tolerance and Variance Inflation Factors (VIF). Tolerance is measured by subtracting $R^2$ from 1 (where $R^2$ is the coefficient of determination that indicates the proportion of the variance in the dependent variable that is predictable from the independent variable) and has a cut-off value of 0.10, with >0.10 being acceptable. VIF measures the correlation of each variable to the others and is the reciprocal of tolerance. VIF has a cut-off score of 10 with <10 being acceptable (O'Brien, 2007).

## 3.5 Methods of Data Analyses

Methods of data analyses included the General Linear Model (GLM), which is a broad conceptual framework that incorporates a large set of statistical models. It includes: structural equation modelling (SEM) which was used to answer the first research question; path analysis, correlation and independent sample *t*-tests which were used to answer the second research question; cluster analysis which was used to answer the third research question; and moderation and mediation analyses which were used to answer the fourth research question. Advantages and limitations of each statistical test as well as the reasons behind choosing each one, are discussed independently in each section.

### 3.5.1 Structural Equation Modelling and Goodness of Fit

SEM is a statistical technique from the GLM family of statistics. It is an exceedingly broad data-analytic framework that is associated with unique statistical procedures (Tomarken & Waller, 2005). SEM only gained popularity over the past two decades because of its many advantages and has become '*a particularly attractive data-analytic option in recent years*' (Tomarken & Waller, 2005, p. 56). This data analytic method was used for a number of reasons. It provides measures of global fit in the summary evaluation, which allows comparisons with global cut-off scores (Tomarken & Waller, 2005). SEM allows the researcher to directly test the measurement model with the alternate hypothesis rather than the null hypothesis (Tomarken & Waller, 2005). It also calculates direct and indirect relationships between the variables in path analysis, which is particularly useful in establishing statistical relationships between the variables. Furthermore, all statistical tests involving SEM could be conducted in M*plus* version 7.3 (Muthén & Muthén, 2012) and SPSS software (version 25.0) (IBM Corp., 2019) to ensure accuracy and minimise human errors.

Given the large number of goodness of fit indices available, multiple indices were used to provide a comprehensive evaluation of model fit (Hu & Bentler, 1995; 1999). Goodness of fit was assessed with the Root Mean Square Error of Approximation (RMSEA), the Standardised Root Mean Square Residual (SRMR), the Tucker-Lewis Index (TLI), and the Comparative Fit Index (CFI). In this study, the cut-off scores to indicate acceptable fit for the data were CFI and TLI $\geq 0.90$, RMSEA $\leq 0.06$ and SRMR $\leq 0.08$, although such values are taken as rough guidelines, not golden rules (Marsh, Hau, & Grayson, 2005; Marsh, Hau, & Wen, 2004).

**Factor Analysis**

Factor Analysis was used to answer the first research question, that is, examining the factor structures of both the AMS and the SCEQ instruments. Given the explicit calls made by researchers to further investigate the factor structure of the AMS (Cokley, Bernard, Cunningham, & Motoike, 2001; Fairchild, Horst, Finney, & Barron, 2005; Guay, Morin, Litalien, Valois, & Vallerand, 2015), and the SCEQ (Handelsman, Briggs, Sullivan, & Towler, 2005), I had to be confident that these instruments would truly measure what they intended to measure. Factor analysis examines the extent to which the observed variables (items) are linked to their underlying latent constructs (Byrne, 2016). Factor analyses were conducted in M*plus* version 7.3 (Muthén & Muthén, 2012).

The two basic types of factor analysis are: Exploratory Factor Analysis (EFA); and Confirmatory Factor Analysis (CFA). EFA determines how the items are related to their underlying factors by what is known as factor loadings (which are the strength of the regression paths from the factors to the items). It is used to determine the number of factors within an instrument which are recommended to be minimal. This analytical approach is considered to be exploratory, since the researcher has no prior knowledge if the items truly measure their intended factors (Byrne, 2016). CFA is used when the factor structure of the instrument is known to a certain extent, by the researcher; hence, the model is evaluated by statistical means to determine the adequacy of its goodness-of-fit to the sample data (Byrne, 2016). If the initial model does not fit the data, then it is subsequently modified and the altered model is tested again with the same data (Jöreskog, 1993).

Given the limitations of CFAs and EFAs, a multilevel Exploratory Structure Equation Modelling (ESEM), which is an overarching integration of the best aspects of EFA, CFA and SEM, was also conducted to verify the factor structure of both the AMS and the SCEQ instruments at gender level. The aim was to find out if the questions included in the instruments measured what was claimed by the authors and use statistical tests to determine the adequacy of model fit to the data. To ensure the robustness of results in this study, the data set was randomly split into two equally-sized sub-samples. An EFA was performed on one split of the data, while a CFA was performed on the other split. If both subsamples reproduced similar goodness of fit using these two statistical tests, then the results were considered reliable.

It is common when using SEM to find that the proposed model fit to the data is poor; however, the modification indices, which are generated within the analysis, are carefully used to improve the model fit to the data (Allen, Titsworth, & Hunt, 2009). In this study, the fit of each construct and its items were assessed individually to identify the weak items causing the overall poor fit. To avoid subjectivity, established rules set by Ford, MacCallum, and Tait (1986), and Allen, Titsworth, and Hunt (2009) were used. Decisions concerning retention and reduction of items were based on theoretical justifications. In the AMS, only items that clearly loaded on a factor were retained, and those whose loadings were less than 0.40 cut-off were removed (Ford, MacCallum, & Tait, 1986). In the SCEQ, a predetermined criterion that requires a primary loading of 0.60 and no secondary loading higher than 0.40 was adopted in the reduction of the scale (Allen, Titsworth, & Hunt, 2009).

**Path Analysis**

Path analysis was used to answer the second research question, that is, the influence of fear of failure on academic motivation and engagement by testing the hypothesised relationships between the variables. Path analysis is also termed structural equation modelling. It estimates direct and indirect relationships between the variables which is useful to '*disentangle the complex interrelationships among variables and identify the most significant pathways involved in predicting an outcome*' (Lleras, 2005, p. 29). It is worth mentioning that significant pathways suggesting strong correlations between the variables do not necessarily infer causation among the variables; however, providing evidence to argue for these relationships on the basis of additional qualitative evidence is beyond the scope of this study. Path analysis models complex relations among the variables and determines whether a model fits the observed data (Senn, Espy, & Kaufmann, 2004). Direct relationships from fear of failure to academic motivation (including intrinsic, extrinsic and amotivation) and from academic motivation to engagement (including skills, emotional, participation and performance engagement), as well as the indirect relationships from fear of failure to engagement via academic motivation, were investigated.

Since the variables in the hypothesised model are latent variables that are measured by multiple observed indicators, and in the absence of a known model between the variables involved, a hypothesised structural model was built and tested using sample data (Kline, 2005). The hypothesised model linked the independent variable (which is fear of failure), the intermediary variables (which are extrinsic motivation, intrinsic motivation and amotivation), and the dependent variables (which are skills, emotional, participation and performance engagement). It was important to include all the relevant

variables as this often affects the path coefficients which are used to assess various direct and indirect paths to the dependent variable.

Once the hypothesised model was established, regression weights and goodness-of-fit statistics were then calculated to assess the model fit of the hypothesised model to the data. If the hypothesised model has poor fit to the data, then SEM would help to reject a false model, but it does not confirm a particular model if the true model is unknown. However, if the hypothesised model fits the data well, then the model is consistent with the data but we cannot claim that the model is proven. According to Bollen (1989, p. 68), '*If a model is consistent with reality, then the data should be consistent with the model. But, if the data are consistent with the model, this does not imply that the model corresponds to reality*'. Path analysis was conducted in M*plus* version 7.3 (Muthén & Muthén, 2012).

### 3.5.2 Inferential Statistics

Inferential statistical tests included: independent sample *t*-tests; correlation; and analyses of variance, which are all part of the GLM family of statistics.

#### Parametric Tests

Parametric tests were used to estimate the characteristics of or patterns in the population from which the sample was drawn (Blaiklie, 2003). The aim was to partly answer the second research question by comparing the means of academic motivation and engagement of students with high and low fear of failure. Independent sample *t*-tests were used to compare the means and determine whether there was statistical evidence that the means were significantly different. Pearson's product-moment correlation

coefficient, which is a measure of the linear dependence between any two variables, was calculated to establish relationships between the variables. Its value ranges between +1 and −1, where 1 is total positive linear correlation, 0 is no linear correlation, and −1 is total negative linear correlation.

**Analysis of Variance and Multivariate Analysis of Variance**

Analysis of Variance (ANOVA) is a collection of statistical models that are used to test for significant differences between the means of various groups. ANOVA consists of two types. The first type is one-way ANOVA which compares groups or levels of a single factor based on a single continuous response variable. In this study, one-way ANOVA was used to test for significant differences among the different clusters in the cluster analysis. The second type is two-way ANOVA which compares levels of two or more factors for mean differences on a single continuous response variable. One limitation of ANOVA is that it only assesses one dependent variable at a time.

Multivariate Analysis of Variance (MANOVA) is the same as ANOVA but with two or more continuous response variables. It includes one-way and two-way tests. In this study, one-way MANOVA was used in the cluster analysis, to check if the different clusters were significantly different. It was also used to check the multivariate effect of cluster membership on the dimensions of engagement (skills, emotional, participation and performance). MANOVA extends the capabilities of ANOVA by assessing multiple dependent variables simultaneously.

### 3.5.3 Cluster analysis

Cluster analysis is a member of the GLM family of statistics. It was used to identify profiles of students within the sample that exhibit similar response patterns. Cluster analysis was used to answer the third research question, that is, to examine if students were grouped into homogenous distinct clusters based on their fear of failure and academic motivation. It was also used to examine whether cluster membership was differentially associated with the four dimensions of student engagement (skills, emotional, participation and performance).

The method advocated by Sarstedt and Mooi (2014) was followed. First, hierarchical cluster analysis based on Euclidean distances, using the single linkage method was applied and used to determine the suitable number of clusters. The hierarchical cluster procedure starts with each object representing an individual cluster, then individual clusters sequentially merge, according to their similarities, into homogenous larger clusters (Norušis, 2011; Sarstedt & Mooi, 2014). This type of procedure suffers from a non-uniqueness problem, because changing the order of the objects changes the number of clusters; hence, it had to be repeated until a consistent solution emerged (Sarstedt & Mooi, 2014).

Next, the Variance Ratio Criterion (VRC) by Calinski and Harabasz (1974) was computed, where SPSS software (version 25.0) (IBM Corp., 2019), was allowed to randomly select the initial cluster centres, and use it to assist in identifying the correct number of clusters. To finally determine the correct number of clusters, $\omega_k$ was calculated using the formula: $\omega_k = (VRC_{k+1} - VRC_k) - (VRC_k - VRC_{k-1})$, where $k$ is the number of clusters. The value of $k$ that provided the lowest value of $\omega_k$ was then

selected to be the final correct number of clusters. One limitation of this method is that the minimum number of clusters selected has to be three (Calinski & Harabasz, 1974; Sarstedt & Mooi, 2014).

Second, based on the results of the hierarchical clustering, cluster centroids were aggregated and used as an input for the subsequent k-means clustering. This procedure is based on an algorithm that uses within-cluster variation as a measure to form homogenous clusters and aims at partitioning the data to minimise the within-cluster variation (Sarstedt & Mooi, 2014). Finally, a two-step cluster analysis was used to test if the results from the previous two types of clustering provided an overall goodness-of-fit using the silhouette measure of cohesion and separation.

To explore if cluster groups differed significantly, one-way MANOVA was conducted using the different clusters as the independent variable and the mean score of the variables (fear of failure and academic motivation) as the dependent variables. Also, in order to assess if the dimensions of student engagement (skills, emotional, participation and performance) were significantly different among the different cluster groups, one-way MANOVA was conducted using cluster groups as the independent variable and mean engagement scores as the dependent variable. All analyses were conducted in SPSS software (version 25.0) (IBM Corp., 2019).

In line with Breckenridge's (2000) recommendation to assess the internal validity of the cluster solutions, the data were randomly split into two halves where hierarchical cluster analysis followed by k-means cluster analysis was conducted on each half. Next, the participants from each half were assigned to new clusters based on their Euclidean

distances from the cluster centroids identified in the other half. Finally, Cohen's kappa (Cohen, 1960) (discussed in section 3.5.6) was calculated to compare the agreement rate of the newly assigned clusters with the original cluster solution, for which a minimum value of 0.60 was considered acceptable (Vansteenkiste, et al., 2012). External validity of the cluster solutions was assessed, based on the results of testing the association between cluster membership and student engagement (skills, emotional, participation and performance engagement). According to Hair, Anderson, Tatham, and Black (1998), if statistically significant differences are found between the clusters on the components of student engagement, then predictive validity is established.

### 3.5.4 Mediation

Mediation was used to partly answer the fourth research question, that is, if academic motivation, as a differentiated construct, modulates the relationship between fear of failure and student engagement. This includes examining if external regulation, introjected regulation and identified regulation play a mediating role in the relationship between fear of failure, and engagement. Mediation happens when the hypothesised relationship between the independent variable (X) and the dependent variable (Y) exists due to the influence of a third variable (the mediator M) (Baron & Kenny, 1986). When the mediator (M) is included, the direct effect of the independent variable is reduced (from path c to path c′**)** and the effect of the mediator remains significant. Complete mediation happens when the variable X no longer affects variable Y making the path c′ zero. However, partial mediation occurs when the path from X to Y is reduced in size but is still different from zero when the mediator M is introduced (Baron & Kenny, 1986). Figure 3.1 explains the paths between the variables X, Y and M. Path c is called the total effect and path c′ is called the direct effect.

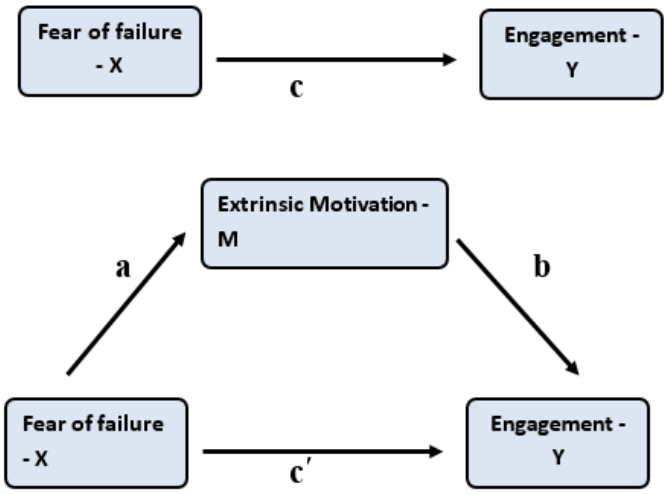


Figure 3.1 Explains the paths between the variables X, Y and M.

The Sobel test is a method for testing the significance of the mediation effect by determining whether the reduction in the effect of the independent variable, after introducing the mediator, is a significant reduction (Sobel, 1986; Sobel, 1982). Mediation analyses were conducted in SPSS software (version 25.0) (IBM Corp., 2019), using the PROCESS plug in (version 2.16), which is a computational tool for SPSS. Particular interest was paid to PROCESS model 4.

### 3.5.5 Moderation

Moderation was used to partly answer the fourth research question, that is, if academic motivation, as a differentiated construct, modulates the relationship between fear of failure and engagement. This includes examining if external regulation, introjected regulation and identified regulation play a moderating role in the relationship between fear of failure and engagement. Moderation happens when a relation between at least two variables depends on, at least, one other variable. The third variable, that is

dichotomous, is referred to as the moderator and the effect of the moderating variable is known as interaction. Moderation analyses were conducted in SPSS software (version 25.0) (IBM Corp., 2019), using the PROCESS plug in (version 2.16), which is a computational tool for SPSS. Particular attention was paid to the two-way interaction (PROCESS model 1).

Evans (1985; 1991) noted researchers' frustration when being unable to find theorised moderator effects and argued that moderator effects explaining 1% of the total variance should be considered in the analysis. In the same vein, McClelland and Judd (1993) advocated the frequent difficulty that researchers encounter in finding statistically significant interactions. They also confirmed that the reduction in model error, due to adding the product term, is often discouragingly low even when statistically significant moderation effects were found. They advised researchers to '*be aware that the odds are against them*' (p. 388); hence, seek to select, oversample, or control the number of predictor variables, in order to be able to detect statistically reliable interactions. This advice was followed in this study, as discussed in the next chapter.

### 3.5.6 Reliability

Examining the reliability of self-reported instruments, when used as part of the data collection process, is crucial (Cronbach, 1951). Score reliability is defined as the degree to which scores in a particular sample are free from random measurement error (Kline, 2005). The type of reliability coefficient reported most often in the literature is Cronbach's alpha and is used to evaluate the degree to which different test items that probe the same construct produce similar results (Cronbach, 1951). It measures split-half reliability by examining the scores between each item of the instrument and the

sum of all the other relevant items, providing a coefficient of inter-item correlations. Cronbach's alpha coefficient of 0.80 and above indicates a strong relationship between the items within the instrument suggesting high internal consistency, and coefficients ranging from 0.70 to 0.80 suggest acceptable internal consistency.

Cohen's kappa (Cohen, 1960) is a measure of inter-rater agreement. It ranges from -1 to +1, where values ≤ 0 indicate disagreement; 0.01–0.20 indicate slight agreement; 0.21–0.40 indicate fair agreement; 0.41– 0.60 indicate moderate agreement; 0.61–0.80 indicate substantial agreement; and 0.81–1.00 indicate an almost perfect agreement (McHugh, 2012). In this study, a minimum value of 0.60 was considered acceptable (Vansteenkiste, et al., 2012).

### 3.5.7 Validity

Examining the validity of self-reported instruments, when used as part of data collection process, is crucial (Westen & Rosenthal, 2003). Score validity refers to the soundness of the inferences based on the scores. It conveys to the researcher whether applying a test is capable of achieving certain aims and is subsumed under the broader concept of construct validity (Kline, 2005). How construct validity should be properly viewed is still a subject of debate for validity theorists (Westen & Rosenthal, 2003). Validity was defined as '*the degree to which a test measures what it claims, or purports, to be measuring*' (Brown, 1996, p. 231). Benson (1998) identified three essential components for developing a strong programme of construct validity: (1) substantive component; (2) structural component; and (3) external component.

In the same vein, Messick (1989, p. 6) defined validity as '*an overall evaluative judgment of the degree to which empirical evidence and theoretical rationales support the adequacy and appropriateness of interpretations and actions based on test scores or other modes of assessment*'. Messick (1994) proposed six distinguishable aspects of construct validity for educational measurement. These are: (1) content; (2) substantive; (3) structural; (4) generalisability; (5) external; and (6) consequential aspects of construct validity. Content related evidence includes evidence of content relevance representativeness (Lennon, 1956; Messick, 1989). Substantive evidence refers to whether the data generated by the instrument are consistent with the theoretical rationales. Structural evidence refers to the reliability of the scoring structure of the instrument and the complexities of the theoretical method (Loevinger, 1957). It includes: correlation coefficients; factor analysis; and confirmatory factor analyses among many other statistical forms of analyses.

Generalisability evidence refers to the extent to which score properties and interpretations generalise to and across populations (Cook & Campbell, 1979; Shulman, 1970). External evidence refers to how the instrument relates to other measures of the same construct and to other theoretical constructs. Consequential evidence refers to the potential consequences of test use regarding the sources of invalidity related to issues of bias and fairness (Messick, 1980; 1989). This also requires making judgements regarding test score interpretation, test score use and social consequences. Applying Messick's (1994) six aspects of construct validity was beyond the scope of this study; hence, it was a limitation. The focus was narrowed to structural evidence of construct validity which, in this study, were assessed using correlation coefficients and confirmatory factor analyses.

Internal validity refers to the degree to which an instrument truly measures what it is intended to measure; however, external validity is when the results are generalised beyond the sample in the study. Firestone (1993) developed two models of generalisation, which affect quantitative research. The classic sample-to-population (statistical) generalisation, which concerns extrapolating from a sample, chosen at random, to a population. This model was applied in this study, where the sample was chosen at random and the results were extrapolated to the population. Also, analytic generalisation, which concerns situations where researchers generalise from particulars to broader constructs or theory by identifying evidence that supports that conceptualisation (Firestone, 1993). If data are valid, then it must be reliable; however, if the data are reliable that does not mean that it is valid (Firestone, 1993). Hence, reliability is necessary, but not a sufficient condition for validity.

External validity, in this study, is concerned with the question of whether the results can be generalised beyond the sample of participants involved and includes issues of sample representativeness and sample size (Bryman, 2004). In this study, the sample represents undergraduate students who are randomly drawn from three different faculties (a faculty of health and social care, a faculty of education, and a faculty of arts and science) within one higher education institution in the North West; hence this sample is not representative of the population of undergraduate students in the United Kingdom as a whole. Therefore, findings can only be generalised to the population from which the sample was selected, that is, the population of undergraduate students from this particular higher education institution in the North West. The sample size of this study in relation to power is discussed later (see section 3.6). It is acknowledged that while the findings of this study may be valid in one setting, that does not necessarily mean

that they are valid in all other settings. Findings of this study could be generalised from sample-to-population if these were found to be true in other settings too (as recommended by Firestone, 1993) and were also found to be in agreement with other researchers who researched these constructs.

### 3.5.8 Common Method Variance

Since data were collected using self-reported instruments, the possibility of common method biases which arise from having a common measurement instrument threatened the validity of the findings of this study. This could either inflate or deflate the true relationship among the constructs under investigation, thus leading to both Type I and Type II errors (Podsakoff, MacKenzie, Lee, & Podsakoff, 2003). Common method variance is the variance that is attributable to the measurement method rather than to the constructs the measures represent (Podsakoff, MacKenzie, Lee, & Podsakoff, 2003). It is a result of: implicit theories and illusory correlations; social desirability; positive and negative affectivity; and negatively-worded (reverse-coded) items.

Implicit theories and illusory correlations refer to the respondents' beliefs about the covariation among particular traits, behaviours, or outcomes. It occurs when consistency motif is the potential source of common method variance (Berman & Kenny, 1976; Chapman & Chapman, 1967; 1969). That is, the respondents' tendency to remain consistent in their responses (Podsakoff & Organ, 1986), particularly when asked to recall behaviours or attitudes (Podsakoff, MacKenzie, Lee, & Podsakoff, 2003) such as the ones under investigation in this study (fear of failure, motivation and engagement). This will therefore result in producing relationships that would not otherwise exist at the same level in real-life settings. Social desirability refers to the

tendency of some participants to respond to questionnaire items in view of their social acceptability rather than their true feelings. Since the instruments measure constructs which are closely linked to self-image and self-esteem, this can lead to a subconscious tendency to paint a positive picture of one's self, or at least to avoid giving a negative impression.

Positive and negative affectivity refers to the respondents' affectivity as a mood-dispositional dimension that reflects their negative or positive emotionality, and that affects their ratings on self-report questionnaires (Burke, Brief, & George, 1993; Watson & Clark, 1984). Feldman, Altrichter, Posch, and Somekh (2018) highlighted that there is no way of ensuring that participants understand the questions as intended by the authors and that the questions may not always be taken seriously by everyone, particularly if the topic is not important to the participants. However, it is argued that the anonymous and impersonal nature of the questionnaires make it easier for the respondents to be honest and reflective. Therefore, any effects of implicit theories, social desirability, positive and negative affectivity, are expected to be of minimal effect.

Reverse-coded items refers to reversing the code of a negatively-worded question. Research has shown that reverse-coded items may produce artefactual response factors (Harvey, Billings, & Nilan, 1985) that may disappear after the reverse-coded items are rewritten in a positive manner (Idaszak & Drasgow, 1987) and hence forms a method bias. Using reverse-coded items was avoided in this study.

According to Podsakoff, MacKenzie, Lee, and Podsakoff's (2003) recommendations, common method variance could be reduced by protecting the respondent's anonymity and using Harman's single factor test. That is, to include all items from all of the constructs in the study into a factor analysis to determine whether the majority of the variance can be accounted for by one general factor. Both of these recommendations were taken into account in this study, to minimise the effect of common method variance.

### 3.6 Power

Statistical power analyses provide a useful set of tools to help researchers design and evaluate their research (Murphy, 2004). Power refers to the probability of rejecting a false null hypothesis. Statistical tests that fail to reject the null hypothesis when that hypothesis is false are referred to as making a Type II error. The conditional probability for a type II error is $\beta$, and the power is defined as $1 - \beta$. According to Murphy (2004), power analysis is important as it informs the researchers of the adequacy of the design of their research in examining particular phenomena.

Murphy (2004, p. 121) argued that, '*researchers who take power seriously will tend to conduct better, more credible studies than those who ignore the statistical power of their tests*' and that there is little uncertainty or variation in study outcomes in a highly sensitive study. Hence, in this study, power was taken seriously in order to make the results credible. G*Power (Faul, Erdfelder, Buchner, & Lang, 2009) was used in a priori to determine the optimal minimum sample size based on set significance level, effect size, and a desired power. It was also used in a post hoc analysis to determine the power of each of the statistical tests that were conducted, based on significance

levels, the existing effect size, and the existing sample size used in the study (Faul, Erdfelder, Buchner, & Lang, 2009). The aim was to ensure that Type I and Type II errors were minimised.

### 3.6.1 A Priori

A priori analysis is a method for controlling statistical power before a study is actually conducted (Faul, Erdfelder, Lang, & Buchner, 2007). Researchers suggested that the power of a statistical test depends on: significance level ($\alpha$); effect size; and the reliability of sample results that are reliant on sample size (Lenth, 2001). Significance level and sample size are decided by the researcher; however, effect size is determined by the phenomenon under investigation (Lenth, 2001).

Cohen (1988) suggested set values for measuring effect size, where 0.10 represents small effect, 0.25 represents medium effect, and 0.40 represents large effect. It has been argued that the sample size involved, relative to the goal of the study, needs to be sufficiently large for results to be statistically significant (Kraemer & Thiemann, 2016; Lipsey, 1990). Verma and Goodale (1995) confirmed that only the sample size can be used to control statistical power, given that the $\alpha$ level is fixed at 0.05 (or some other value) and that the effect size is assumed to be fixed at some unknown value, as researchers cannot change the effect of a particular phenomenon. There are several rules of thumb for determining the minimum optimal sample size required which ignore power and effect sizes; however, Green (1991) argued that researchers should use methods that incorporate effect size.

Significance testing when researching a particular phenomenon is important because it provides a rough guide to other researchers researching the same phenomenon about what they might expect (Murphy, 2004). In this study, the independent sample *t*-test was used to compare the means of extrinsic motivation, intrinsic motivation and amotivation of students with high fear of failure and low fear of failure. It has been suggested by Cohen (1988) that for an independent sample *t*-test, given a medium to large effect size, 30 participants per cell should lead to about 80% power (which is the minimum suggested power for an ordinary study). A priori using G*Power with a set effect size of 0.5 (representing medium effect size), significance level $(\alpha)$ of 0.05 and power of 0.95 showed an optimal minimum sample size of 176 participants.

The general rule of thumb to determine sample size when examining relationships using correlation or regression is no less than 50 participants, with the sample size increasing with larger numbers of independent variables. For testing multiple correlations, Green (1991) suggested that the sample should be > 50 + 8m (where m is the independent variable) hence the minimum number of participants in this study should be 58 participants. However, a priori using G*Power with a set effect size of 0.3 (representing medium effect size), significance level $(\alpha)$ of 0.05 and power of 0.95 showed that the optimal minimum sample size is 111 participants for investigating correlations.

Other rules of thumb include that of Green (1991), who suggested that the sample should be $> 104 + n$, (where $n$ is the number of predictors and includes fear of failure, extrinsic motivation, intrinsic motivation, and amotivation), assuming a medium sized relationship. Therefore, the minimum sample size, according to Green (1991) should be > 108. However, for five or fewer predictors, Harris (1985) suggested

that the number of participants should exceed the number of predictors by at least 50. Therefore the minimum sample size in this study, according to Harris (1985), given the existence of 4 predictors, should be 54 participants.

A priori for moderation analyses using G*Power with a set effect size of 0.15 (representing medium effect size), significance level ($\alpha$) of 0.05, power of 0.95, and 3 predictors showed a minimum sample size of 119 participants. For mediation analyses, the recommended minimum sample size is 405 for a small effect size and power of 0.8 (Fritz & MacKinnon, 2007). A priori for mediation analyses using G*Power with a set effect size of 0.15 (representing medium effect size), significance level ($\alpha$) of 0.05, power of 0.95, and 2 predictors, showed a minimum sample size of 107 participants. It is generally recommended to run a Sobel test, which is a significance test of the indirect effects tested in mediation analyses (Baron & Kenny, 1986).

For tests of statistical significance, the recommended sample sizes ranged from: (1) 30 to 460 cases (Wolf, Harrington, Clark, & Miller, 2013); (2) a minimum of 100 or 200 (Boomsma, 1982; 1985); (3) 5 or 10 observations per estimated parameter (Bentler & Chou, 1987; Bollen, 1989); and (4) 10 cases per variable (Nunnally, Bernstein, & Berge, 1967). The rule of thumb for the chi-square goodness of fit test is that no expected frequency should be below 5. A priori using G*Power with a set effect size of 0.3 (representing medium effect size), significance level ($\alpha$) of 0.05, power of 0.95 and df of 2, showed an optimal minimum sample size of 172 participants for conducting goodness of fit tests.

Several rules of thumb exist regarding the sample size for conducting factor analysis. A good general rule of thumb for factor analysis is 300 cases (Tabachnick & Fidell, 1996) or 50 participants per factor (Pedhazur & Schmelkin, 1991), which means that the expected sample size for this study should be 350 (which is the product of 7 factors by 50 participants). Hair, Anderson, Tatham, and Black (1995) recommended a minimum of 15 to 20 cases for each variable in an exploratory procedure, as a larger sample may reveal an alternate factor structure; however, this has not been theoretically justified and has been proven inadequate (Trninić, Jelaska, & Štalec, 2013). This means that the minimum recommended number of participants according to Hair, Anderson, Tatham, and Black (1995) should be 420 participants (which is the product of 28 items by the minimum recommendation of 15).

Similarly, numerous rules of thumb exist for determining the sample size for conducting a SEM analysis (path analysis). These include: 10 cases per variable (Nunnally, Bernstein, & Berge, 1967); a minimum sample size of 100 or 200 (Boomsma, 1982; 1985); and 5 or 10 observations per estimated parameter (Bentler & Chou, 1987). However, Wolf, Harrington, Clark, and Miller (2013) recommended a range of sample size requirements from 30 to 460 cases.

Generally, there is no rule of thumb regarding the minimum sample size for cluster analysis in relation to the clustering variables; however, Formann (1984) suggested that $2^m$ can be used, where m is the number of clustering variables, which is 2 in this study. Dolnicar, Grün, Leisch, and Schmidt (2014) suggested a sample size of 70 times the number of variables, which in this study would be 140 participants (which is the product of 70 by 2).

Therefore, in conclusion, the minimum optimal sample size required should be the largest of these determined above, hence, should be at least 460 participants, at an alpha level of 0.05, and a medium effect size of 0.25.

### 3.6.2 Post Hoc

Post hoc power analyses were conducted after the study has been completed in order to assess the power of each of the statistical tests in rejecting an incorrect null hypothesis. G*Power was again used, but this time to calculate power based on significance levels, effect size, and the existing sample size (Faul, Erdfelder, Buchner, & Lang, 2009). Results are reported following each test, in chapter 4.

In line with Breckenridge's (2000) recommendations, a double-split-cross-validation procedure was conducted for the cluster analysis, as discussed in section 3.5.3. Results are reported following the cluster analysis in chapter 4.

## 3.7 Ethical Considerations

Ethics approval was sought and received through Lancaster University and the university where this research was conducted. This study adhered to the British Educational Research Association Ethical Guidelines (BERA, 2011), and Lancaster University's Codes of Practice for the Conduct of Research. It was ensured that participants were not students whom I would be teaching, so that they would not feel under any pressure to appease their tutor. It was also made clear at the outset that participants were under no obligation to take part in the research. No incentives were used for participating and participants were not made to feel under duress at

any point in the research. Participants' anonymity was assured (Cohen, Manion, & Morrison, 2002), and the nature and purpose of the research were shared with all participants (McNiff, Lomax, & Whitehead, 1997).

Each participant was given a participant information sheet and asked to complete a consent form (Appendix Two). Research integrity was upheld throughout, as I have operated '*within an ethic of respect*' for everyone (BERA, 2011, p. 5). No participant was exposed to any danger or harm. Responses to questionnaires were held in password-protected files, and participants were informed that they could withdraw from the project for up to 2 weeks without prejudice. Participants who chose to decline from taking part or decided to withdraw within 2 weeks have not suffered any negative consequences, such as unfair discrimination, reduction in the level of care, or any other disadvantage either actual or perceived. Data collection was not scheduled at times allocated for teaching and instructional activity without justification.

### 3.8 Chapter Summary

This chapter provided an overview of the research paradigm, which was driven by the research questions and the nature of the social phenomenon under investigation, which is fear of failure. An objectivist's stance and a post-positivist lens were used to minimise subjectivity, warranting a quantitative approach. Three predetermined instruments for measuring the three constructs under investigation were used to yield the required statistical data, using a sample of undergraduate students from one higher education institution in the United Kingdom.

This chapter also included a detailed description of: methods chosen for data screening (which included dealing with missing data, normality issues, outliers, homoscedasticity and multicollinearity); and methods of data analyses (which included factor analyses, path analysis, cluster analysis, moderation, mediation and inferential statistics tests). Finally, ethical considerations and a summary of how power was used to set and evaluate this study were also discussed. The next chapter presents the findings of this study.

# Chapter 4 Data Presentation and Analysis

## 4.1 Chapter Overview

This chapter presents and scrutinises the data. It describes the sample demographics and how data were screened for issues of normality, outliers, homoscedasticity and multicollinearity. It also presents the results from conducting various analyses. First, exploratory factor analysis and confirmatory factor analysis were used to answer the first research question, that is, examining the structural evidence of construct validity of the AMS and the SCEQ instruments. Second, path analysis was used to answer the second research question, that is, the influence of fear of failure on academic motivation and engagement.

Third, cluster analysis was used to answer the third research question, that is, identifying if clusters of students with particular profiles of fear of failure and motivation exist and if these are associated with engagement. Finally, mediation and moderation analyses were used to answer the fourth research question, that is, finding if extrinsic motivation played a modulatory role in the relationship between fear of failure and engagement. Threats of reliability, validity and issues of common method variance are also exposed and addressed in this chapter.

## 4.2 Participants' Demographics

Considering issues of external validity, the decision was made to reach for a diverse random sample within the institution. Therefore, neither a particular faculty nor a particular course was targeted, rather, the sample consisted of 866 undergraduate

students from diverse courses within the three faculties (the faculty of health and social care, the faculty of education, and the faculty of arts and science). There were a total of 354 male students (40.9%), 504 female students (58.2%) and 8 students (0.9%) who did not state either group. There was unfortunately no way to find out if the gender split among the sample was representative of the gender split among the population of students within this institution. All students were on a three-year undergraduate course, with a mean age of 21 years. Participants consisted of 303 students from year 1 (35%), 322 students from year 2 (37.2%), 231 students from year 3 (26.7%), and 10 students who chose not to declare their year group (1.1%). The majority of the students came from a White ethnic heritage (n = 793, 91.6%), and smaller numbers came from Asian/Asian British (n = 41, 4.7%), Black/Black British (n = 10, 1.2%) and other ethnic groups (n = 22, 2.5%).

### 4.3 Data Screening

Data screening involved: dealing with missing data; detecting normality issues and dealing with outliers; homoscedasticity; and multicollinearity. In addition, various statistical tests were conducted on the data collected from online and paper and pencil questionnaires to ensure that the responses made by the participants were not affected by the method used to collect data.

#### 4.3.1 Dealing with Missing Data

In examining the completeness of the responses to the three instruments, it was found that the number of missing cases ranged between 7 and 0, and represented 6.1% of the data. The expected maximisation algorithm (Laird, 1988; Rudd, 1991) was used to

estimate the missing data (Moon, 1996) in this study. The data were then examined for normality issues and outliers.

### 4.3.2 Detecting Normality Issues and Dealing with Outliers

When testing for normality, results of investigating skewness and kurtosis (displayed in Table 4.1) showed that all subscales involved in the study had values within the acceptable limits of ±2 (Field, 2000; 2009; Gravetter & Wallnau, 2014; Trochim & Donnelly, 2006), except for the kurtosis values of two subscales (extrinsic motivation identified and amotivation), which suggested the presence of outliers in the data.

Table 4.1 – Normality and multicollinearity

| Subscale | Normality | | Multicollinearity | |
|---|---|---|---|---|
| | Skewness | Kurtosis | Tolerance | VIF |
| Extrinsic Motivation Introjected | -.63 | -.12 | .42 | 2.39 |
| Extrinsic Motivation Identified | -1.32 | 2.33 | .53 | 1.89 |
| Extrinsic Motivation External | -.75 | .25 | .69 | 1.45 |
| Intrinsic Motivation Experience | .14 | -.65 | .48 | 2.10 |
| Intrinsic Motivation Accomplish | -.25 | -.41 | .29 | 3.49 |
| Intrinsic Motivation Know | -.54 | .05 | .35 | 2.83 |
| Amotivation | 1.72 | 2.25 | .80 | 1.25 |
| Skills Engagement | -.60 | .58 | .57 | 1.76 |
| Emotional Engagement | -.38 | -.10 | .49 | 2.04 |
| Participation Engagement | -.19 | -.46 | .61 | 1.64 |
| Performance Engagement | -.15 | -.41 | .64 | 1.55 |
| Fear of failure | -.26 | -.54 | – | – |

In line with Barnett and Lewis's (1984) recommendations, Mahalanobis's distances were calculated using SPSS software (version 25.0) (IBM Corp., 2019) and a total of 16 entries were deleted. Upon deletion of the 16 entries, 850 usable samples were retained in the database for further examination. This consisted of 348 male students (41%), 494 female students (58.1%) and 8 students (0.9%) who did not state either

group. Following the deletion of outliers, a normality plot was drawn to investigate if the shape of the data followed a normal distribution. According to the central limit theorem, and given the sample size involved in this study (which is > 30), the sampling distribution would tend to be normal, regardless of the shape of the data (Field, 2009). Hence, the results of the normality plot displayed in Figure 4.1 were considered acceptable.

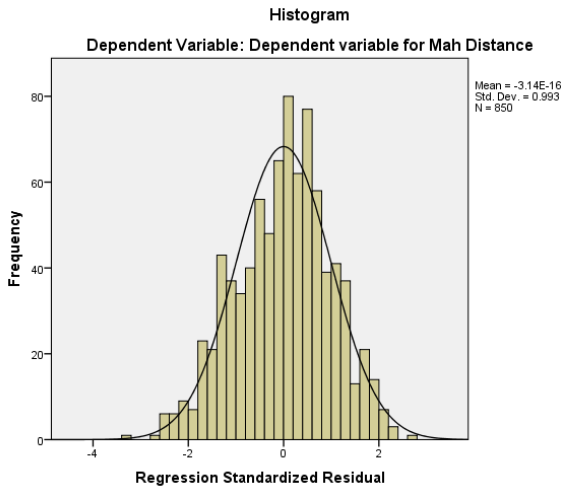


Figure 4.1 – Normality plot following the deletion of outliers

### 4.3.3 Testing for Homoscedasticity and Multicollinearity

A scatter plot with the variable on the y-axis and the variable's residual on the x-axis revealed no major violation of the assumption of homoscedasticity. Figure 4.2 demonstrated reasonable spread of the data both above and below the zero and was considered acceptable. Results also showed no multicollinearity issues in the data since all tolerance values were >0.10 and all VIF values were <10 (see Table 4.1). A P-P plot (see Figure 4.3) also showed little risk of multicollinearity since all plotted points were close to the line.

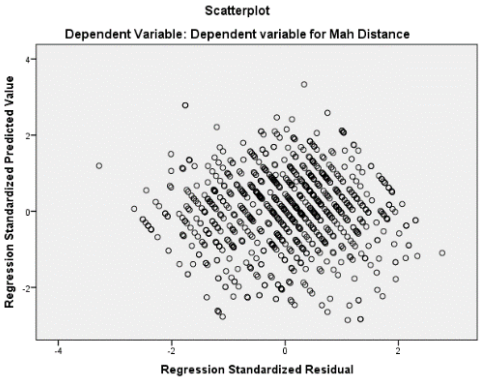


Figure 4.2 – Scatter plot

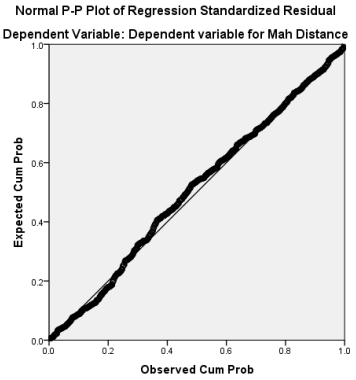


Figure 4.3 – P-P plot

### 4.3.4 Online versus Paper Based Questionnaires

Although data were collected using identical copies of online and paper and pencil questionnaires, it was essential to investigate if the responses were affected by the method used to collect data. A total score of the items, of each of the three instruments used in this study, was calculated before being subjected to the different statistical tests. Cronbach's alpha coefficient (presented in Table 4.2) of all the three instruments using the online and paper and pencil version were >0.80 suggesting high internal consistency and reliability of both the online and the paper and pencil methods. Also, the effect size for the PFAI–S instrument *(d = .03),* the AMS instrument *(d = .20),* and the SCEQ instrument *(d = .03),* did not exceed Cohen's (1988) convention for a small effect size *(d = .20).* These results suggest that the differences in the responses made using the online and the paper and pencil methods were small and unlikely to influence the outcomes of this study.

Furthermore, an independent samples *t*-test was conducted to compare the mean scores of the online version of the PFAI–S, AMS and SCEQ instruments with the paper and pencil version. Results showed no significant difference in the mean scores of: the PFAI–S online version ($M$ = 15.9, $SD$ = 4.80) and the paper and pencil version ($M$ =

16.0, *SD* = 4.61), *t*(848) = -.37, *p* >.05; and the SCEQ online version (*M* = 85.7, *SD* = 13.82) and the paper and pencil version (*M* = 86.1, *SD* = 12.23), *t*(848) = -.37, *p* >.05. However, results showed that there was significant difference between the AMS online version (*M* = 123.4, *SD* = 22.99) and the paper and pencil version (*M* = 127.8, *SD* = 21.71); *t*(848) = -2.68, *p* <.01. Table 4.2 shows statistical comparisons of the online and paper and pencil versions of the questionnaires for each of the three instruments used to collect data.

Table 4.2 – Statistical comparisons of online and paper-based versions of the questionnaires

| Scale | Group | N | Mean | SD | *t* | df | *p* | α | *d* |
|---|---|---|---|---|---|---|---|---|---|
| PFAI – S | Online | 570 | 15.9 | 4.80 | - .37 | 848 | .71 | .80 | .03 |
| | Paper | 280 | 16.0 | 4.61 | | | | .81 | |
| AMS | Online | 570 | 123.4 | 22.99 | -2.68 | 848 | <.01 | .89 | .20 |
| | Paper | 280 | 127.8 | 21.71 | | | | .90 | |
| SCEQ | Online | 570 | 85.7 | 13.82 | - .37 | 848 | .71 | .86 | .03 |
| | Paper | 280 | 86.1 | 12.23 | | | | .84 | |

In conclusion, although there were significant differences in the responses made by the respondents when using online and paper and pencil versions with one of the three instruments used, the effect size did not exceed Cohen's (1988) convention for a small effect size. Therefore, it is acceptable at this stage to suggest that the differences in the responses made using the online and the paper and pencil methods are unlikely to influence the outcomes of this study. These findings are in agreement with other researchers who also reported no or very few differences between online and paper and pencil questionnaires (De Looij-Jansen, Petra, & De Wilde, 2008; Denscombe, 2006;

Ritter, Lorig, Laurent, & Matthews, 2004). Additional tests (including factor analyses, correlation, reliability, validity, and common method variance) are conducted below and provide further refinement and selection of the data.

### 4.4 Factor Analyses and Goodness of Fit

The sample of 850 responses was split randomly into two groups ($n$ = 425 each), where different analyses were conducted on one or the other. A CFA was conducted on all three instruments used in this study to confirm if the instruments were consistent with their authors' claims and whether the data fitted the hypothesised measurement model. CFA results of the PFAI–S instrument showed excellent fit to the data when using both split 1: $\chi^2(10) = 492.06$, $p < .001$, CFI = .999, TLI = .993, RMSEA = .029, and SRMR = .011; and split 2: $\chi^2(10) = 508.03$, $p < .001$, CFI = .999, TLI = .996, RMSEA = .021, and SRMR = .009. Cronbach's alpha coefficient of the PFAI–S indicated strong relationship between the items within the instrument, and suggested good internal consistency ($\alpha$ = .81). Since the PFAI–S instrument showed excellent fit to the data and also good internal consistency, there was no need to subject this instrument to any further examinations, but to use it in its current short form, for convenient and practical purposes (Richardson, 2004).

A CFA of the AMS instrument using the previously hypothesised 7-factor structure showed inadequate fit to the data on both split 1: $\chi^2(329) = 860.84$, $p < .001$, CFI = .902, TLI = .888, RMSEA = .062, and SRMR = .065; and split 2: $\chi^2(329) = 844.33$, $p < .001$, CFI = .893, TLI = .877, RMSEA = .061, and SRMR = .064. Similarly, a CFA of the SCEQ instrument using the previously hypothesised 4-factor structure showed inadequate fit to the data on both split 1: $\chi^2(224) = 903.85$, $p < .001$, CFI = .820, TLI =

.796, RMSEA = .085, and SRMR = .072; and split 2: $\chi^2(224) = 770.14$, $p < .001$, CFI = .851, TLI = .831, RMSEA = .076, and SRMR = .071. These results were surprising as they contradicted the claims made by the authors of both instruments. It was therefore essential to examine the factor structures of both AMS and SCEQ instruments in order to identify the underlying relationships between the measured variables.

Given the large number of goodness of fit indices available, the criteria identified in chapter 3 were used to assess model fit (Hu & Bentler, 1995; 1999). The examination of the factor structures, of both the AMS and the SCEQ instruments, was conducted in the same manner, but the criteria that were used for interpretation was somewhat different. To avoid subjectivity, established rules set by Ford, MacCallum, and Tait (1986), and Allen, Titsworth, and Hunt (2009) were used as detailed below.

### 4.4.1 Factor Structure of the AMS

#### Descriptive Statistics and Correlations

Descriptive statistics of means, medians, standard deviations (SD), standard error (SE), and variance (Var) for each item in the AMS are presented in Table 4.3. Item correlations are presented in Table 4.4. Results showed that items within the three overarching subscales (intrinsic motivation, extrinsic motivation and amotivation) were significantly correlated with each other. These included seven subscales which are: Intrinsic Motivation – to know (measured by items 2, 9, 16 and 23); Intrinsic Motivation – towards accomplishment (measured by items 6, 13, 20, and 27); Intrinsic Motivation – to experience stimulation (measured by items 4, 11, 18, and 25); Extrinsic Motivation – identified regulation (measured by items 3, 10, 17 and 24); Extrinsic Motivation – introjected regulation (measured by items 7, 14, 21, and 28); Extrinsic Motivation –

external regulation (measured by items 1, 8, 15, and 22); and amotivation (measured by items 5, 12, 19 and 26).

Results showed no significant evidence to support the simplex pattern as claimed by its authors, that is, having stronger correlations between the adjacent types of motivation than between types that are farther apart on the motivation continuum. Items within the AMS were designed to measure academic motivation using the seven subscales; hence, these were expected to significantly correlate above the recommended 0.40 (Kim & Muller, 1978); however, all correlation values were not high enough to suggest redundancy (all values < 0.8). This means that the correlations between the items were suitable enough to continue with the next part of the analysis; in other words, there was no reason to suggest redundancy of any of the items at this point. Findings also showed a negative correlation between amotivation and intrinsic motivation to know, since these were at opposite ends of the continuum.

Table 4.3 – Descriptive statistics of the AMS items

| Item | Mean | Median | SD | SE | Var |
|---|---|---|---|---|---|
| 1. Because with only a high-school degree I would not find a high-paying job later on. | 4.31 | 4.00 | 1.93 | .07 | 3.74 |
| 2. Because I experience pleasure and satisfaction while learning new things. | 5.15 | 5.00 | 1.44 | .05 | 2.08 |
| 3. Because I think that a university education will help me better prepare for the career I have chosen. | 6.25 | 7.00 | 1.14 | .04 | 1.30 |
| 4. For the intense feelings I experience when I am communicating my own ideas to others. | 3.91 | 4.00 | 1.68 | .06 | 2.82 |
| 5. Honestly, I don't know; I really feel that I am wasting my time at university. | 1.79 | 1.00 | 1.36 | .05 | 1.85 |
| 6. For the pleasure I experience while surpassing myself in my studies. | 4.36 | 4.00 | 1.65 | .06 | 2.73 |
| 7. To prove to myself that I am capable of completing my university degree. | 5.38 | 6.00 | 1.66 | .06 | 2.76 |
| 8. In order to obtain a more prestigious job later on. | 5.70 | 6.00 | 1.42 | .05 | 2.00 |
| 9. For the pleasure I experience when I discover new things never seen before. | 4.95 | 5.00 | 1.53 | .05 | 2.34 |
| 10. Because eventually it will enable me to enter the job market in a field that I like. | 6.16 | 7.00 | 1.27 | .04 | 1.61 |
| 11. For the pleasure that I experience when I read interesting authors. | 3.54 | 3.00 | 1.79 | .06 | 3.19 |
| 12. I once had good reasons for going to university, however, now I wonder whether I should continue. | 2.17 | 1.00 | 1.72 | .06 | 2.96 |
| 13. For the pleasure that I experience while I am surpassing myself in one of my personal accomplishments. | 4.60 | 5.00 | 1.67 | .06 | 2.78 |
| 14. Because of the fact that when I succeed at university I feel important. | 4.44 | 5.00 | 1.84 | .06 | 3.38 |
| 15. Because I want to have "the good life" later on. | 5.29 | 6.00 | 1.66 | .06 | 2.76 |
| 16. For the pleasure that I experience in broadening my knowledge about subjects which appeal to me. | 5.31 | 5.00 | 1.42 | .05 | 2.03 |
| 17. Because this will help me make a better choice regarding my career orientation. | 5.69 | 6.00 | 1.42 | .05 | 2.03 |
| 18. For the pleasure that I experience when I feel completely absorbed by what certain authors have written. | 3.51 | 3.00 | 1.84 | .06 | 3.39 |
| 19. I can't see why I go to university and frankly, I couldn't care less. | 1.49 | 1.00 | 1.11 | .04 | 1.23 |
| 20. For the satisfaction I feel when I am in the process of accomplishing difficult academic activities. | 4.68 | 5.00 | 1.64 | .06 | 2.68 |
| 21. To show myself that I am an intelligent person. | 4.72 | 5.00 | 1.77 | .06 | 3.14 |
| 22. In order to have a better salary later on. | 5.37 | 6.00 | 1.65 | .06 | 2.72 |
| 23. Because my studies allow me to continue to learn about many things that interest me. | 5.39 | 6.00 | 1.42 | .05 | 2.03 |
| 24. Because I believe that a few additional years of education will improve my competence as a worker. | 5.32 | 6.00 | 1.66 | .06 | 2.76 |
| 25. For the "high" feeling that I experience while reading about various interesting subjects. | 3.87 | 4.00 | 1.82 | .06 | 3.30 |
| 26. I don't know; I can't understand what I am doing at university. | 1.57 | 1.00 | 1.20 | .04 | 1.43 |
| 27. Because university allows me to experience a personal satisfaction in my quest for excellence in my studies. | 4.61 | 5.00 | 1.66 | .06 | 2.74 |
| 28. Because I want to show myself that I can succeed in my studies. | 5.40 | 6.00 | 1.58 | .05 | 2.51 |

Table 4.4 – Item correlations of the AMS

| | Subscale | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 13 | 14 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | EM External | 1 | | | | | | | | | | | | | |
| 2 | IM Know | .19** | 1 | | | | | | | | | | | | |
| 3 | EM Identified | .19** | .32** | 1 | | | | | | | | | | | |
| 4 | IM Experience | .19** | .46** | .17** | 1 | | | | | | | | | | |
| 5 | Amotivation | .07 | -.20** | -.30** | -.07* | 1 | | | | | | | | | |
| 6 | IM Accomplish | .11** | .54** | .13** | .41** | -.07 | 1 | | | | | | | | |
| 7 | EM Introjected | .25** | .35** | .24** | .25** | -.13** | .46** | 1 | | | | | | | |
| 8 | EM External | .48** | .21** | .43** | .14** | -.10** | .13** | .34** | 1 | | | | | | |
| 9 | IM Know | .10** | .60** | .19** | .50** | -.20** | .52** | .38** | .15** | 1 | | | | | |
| 10 | EM Identified | .25** | .23** | .62** | .13** | -.21** | .14** | .24** | .50** | .15** | 1 | | | | |
| 11 | IM Experience | .08* | .40** | .01 | .45** | -.01 | .43** | .23** | .02 | .48** | .03 | 1 | | | |
| 12 | Amotivation | .05 | -.17** | -.28** | -.08* | .59** | -.16** | -.05 | -.04 | -.13** | -.22** | .01 | 1 | | |
| 13 | IM Accomplish | .15** | .46** | .17** | .37** | -.16** | .60** | .49** | .18** | .50** | .17** | .39** | -.14** | 1 | |
| 14 | EM Introjected | .33** | .21** | .15** | .32** | -.03 | .27** | .44** | .31** | .23** | .14** | .21** | .01 | .42** | 1 |
| 15 | EM External | .43** | .09** | .26** | .12** | .05 | .10** | .29** | .51** | .06 | .30** | -.02 | .07* | .16** | .53** |
| 16 | IM Know | .05 | .57** | .25** | .43** | -.25** | .51** | .39** | .18** | .63** | .23** | .42** | -.19** | .58** | .34** |
| 17 | EM Identified | .29** | .25** | .50** | .17** | -.15** | .23** | .35** | .49** | .21** | .53** | .08* | -.14** | .27** | .31** |
| 18 | IM Experience | .10** | .40** | -.01 | .49** | .04 | .47** | .30** | .04 | .48** | .01 | .77** | .06 | .45** | .30** |
| 19 | Amotivation | .02 | -.20** | -.31** | -.05 | .58** | -.09** | -.17** | -.12** | -.16** | -.25** | .01 | .59** | -.22** | -.05 |
| 20 | IM Accomplish | .12** | .48** | .16** | .41** | -.19** | .56** | .44** | .18** | .51** | .18** | .38** | -.17** | .61** | .41** |
| 21 | EM Introjected | .32** | .26** | .14** | .31** | -.03 | .35** | .55** | .27** | .31** | .19** | .22** | .01 | .44** | .63** |
| 22 | EM External | .49** | .08* | .32** | .09* | -.03 | .01 | .24** | .65** | .05 | .42** | -.09** | -.01 | .08* | .35** |
| 23 | IM Know | .12** | .53** | .29** | .40** | -.24** | .44** | .36** | .19** | .56** | .30** | .37** | -.16** | .51** | .31** |
| 24 | EM Identified | .36** | .28** | .37** | .21** | -.12** | .23** | .33** | .41** | .26** | .40** | .10** | -.08* | .32** | .37** |
| 25 | IM Experience | .10** | .44** | .07* | .49** | -.02 | .43** | .32** | .06 | .48** | .10** | .60** | -.01 | .48** | .35** |
| 26 | Amotivation | .03 | -.19** | -.25** | -.05 | .59** | -.11** | -.12** | -.09* | -.14** | -.26** | .01 | .63** | -.18** | -.03 |
| 27 | IM Accomplish | .14** | .48** | .15** | .46** | -.18** | .56** | .43** | .19** | .54** | .15** | .39** | -.15** | .60** | .47** |
| 28 | EM Introjected | .22** | .31** | .22** | .25** | -.15** | .41** | .60** | .32** | .38** | .26** | .19** | -.09* | .54** | .56** |

*Note.* ** $p < 0.01$, * $p < 0.05$.

Table 4.4 – Item correlations of the AMS (Continued)

| | Subscale | 15 | 16 | 17 | 18 | 19 | 20 | 21 | 22 | 23 | 24 | 25 | 26 | 27 | 28 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 15 | EM External | 1 | | | | | | | | | | | | | |
| 16 | IM Know | .14** | 1 | | | | | | | | | | | | |
| 17 | EM Identified | .40** | .32** | 1 | | | | | | | | | | | |
| 18 | IM Experience | .02 | .46** | .13** | 1 | | | | | | | | | | |
| 19 | Amotivation | -.02 | -.24** | -.18** | .06 | 1 | | | | | | | | | |
| 20 | IM Accomplish | .15** | .56** | .29** | .46** | -.12** | 1 | | | | | | | | |
| 21 | EM Introjected | .40** | .37** | .31** | .34** | -.03 | .52** | 1 | | | | | | | |
| 22 | EM External | .66** | .07 | .44** | -.06 | -.06 | .10** | .33** | 1 | | | | | | |
| 23 | IM Know | .16** | .69** | .37** | .41** | -.23** | .54** | .40** | .19** | 1 | | | | | |
| 24 | EM Identified | .38** | .33** | .47** | .18** | -.13** | .32** | .38** | .44** | .40** | 1 | | | | |
| 25 | IM Experience | .06 | .49** | .19** | .73** | -.02 | .47** | .37** | -.01 | .48** | .28** | 1 | | | |
| 26 | Amotivation | -.01 | -.21** | -.17** | .05 | .74** | -.12** | -.04 | -.04 | -.21** | -.10** | -.01 | 1 | | |
| 27 | IM Accomplish | .21** | .57** | .31** | .50** | -.14** | .65** | .53** | .15** | .55** | .35** | .55** | -.13** | 1 | |
| 28 | EM Introjected | .36** | .49** | .43** | .28** | -.20** | .53** | .65** | .31** | .46** | .41** | .35** | -.14** | .63** | 1 |

*Note*. ** $p < 0.01$, * $p < 0.05$.

**Exploratory and Confirmatory Factor Analyses**

Factor analyses were used to assess the adequacy of a previously established 7-factor model by the authors (Vallerand, Blais, Brière, & Pelletier, 1989). An EFA was conducted on split 1 using M*plus* software (Muthén & Muthén, 2012), which uses the maximum-likelihood estimator (MLR) with robust standard errors. Table 4.5 represents a summary of fit indices of EFA on split 1 of the data (5 – 7 factor models). Examination of the fit indices indicated that the data inadequately fitted the 5-factor model: $\chi^2(248) = 747.62$, $p < .001$, CFI = .930, TLI = .894, RMSEA = .069, and SRMR = .028. The data fitted the 6-factor model: ($\chi^2(225) = 579.42$, $p < .001$, CFI = .951, TLI = .917, RMSEA = .061, and SRMR = .023); and the 7-factor model: ($\chi^2(203) = 470.71$, $p < .001$, CFI = .963, TLI = .931, RMSEA = .056, and SRMR = .019) best.

Table 4.5 – Model fit indices for EFA on split 1 of the AMS

| Model | $\chi^2$ (df) | | CFI | TLI | RMSEA | SRMR |
|---|---|---|---|---|---|---|
| 5-Factor | 747.62 | (248) | .930 | .894 | .069 | .028 |
| 6-Factor | 579.42 | (225) | .951 | .917 | .061 | .023 |
| 7-Factor | 470.71 | (203) | .963 | .931 | .056 | .019 |

*Note*. All $\chi^2$ statistics $p < .001$

Further investigations of the factor structure of the 7-factor model revealed that no items loaded on the seventh factor. However, the 6-factor model yielded a better factor structure and adequate fit to the data (see Table 4.6). Items 1, 8, 15, and 22 loaded on factor 1 (Extrinsic Motivation External); items 3, 10, 17, and 24 loaded on factor 2 (Extrinsic Motivation Identified); items 21, 28, 14, and 7 loaded on factor 3 (Extrinsic Motivation Introjected); items 2, 9, 16, and 23 loaded on factor 4 (Intrinsic Motivation

Know); items 4, 11, 18 and 25 loaded on factor 5 (Intrinsic Motivation Experience); items 13, 20, and 27 cross loaded on both factors 3 (Extrinsic Motivation Introjected) and 4 (Intrinsic Motivation Know), with item 6 loading on factor 4; and items 5, 12, 19, and 26 loaded on factor 6 (Amotivation).

Decisions concerning retention and reduction of items were based on theoretical justifications. Only items that clearly loaded on a factor were retained. Also, items whose loadings were less than 0.40 cut-off were removed (Ford, MacCallum, & Tait, 1986). Hence, 6 items were dropped (items 4, 7, 6, 13, 20 and 27) and 22 items were retained. An EFA on the reduced scale using split 1 showed adequate fit to the data: $\chi^2(114) = 273.23$, $p < .001$, CFI = .969, TLI = .938, RMSEA = .057, and SRMR = .018. Table 4.7 shows the standardised factor loadings from EFA on split 1 of the data for the final six-factor model after reduction. A version of the reduced scale is found in Appendix Three.

After the deletion of 6 items and inclusion of 4 pairs of error covariance (items 10 and 3; 15 and 8; 11 and 25; and 26 and 19), a CFA showed adequate fit to the data for both split 2: $\chi^2(190) = 456.11$, $p < .001$, CFI = .922, TLI = .905, RMSEA = .058, and SRMR = .056; and split 1: $\chi^2(190) = 488.38$, $p < .001$, CFI = .922, TLI = .906, RMSEA = .061, and SRMR = .060. In summary, the data collected using the reduced scale were used in the analyses of this study because it adequately fitted the data.

A multi-group ESEM for gender (which only included males and females due to sample size constraints as highlighted earlier in this chapter) showed good fit to the data: $\chi^2(332) = 383.85$, $p < .001$, CFI = .985, TLI = .980, RMSEA = .027, and SRMR = .041.

Factor loadings for the total sample and for male and female participants are shown in Table 4.8. Results indicated that the difference in the factors were small across gender. In other words, the scale could be used to collect data from both genders.

Table 4.6 – EFA factor loadings on split 1 of the initial AMS (six factors)

| Item | No | F1 | F2 | F3 | F4 | F5 | F6 |
|---|---|---|---|---|---|---|---|
| Because with only a high-school degree I would not find a high-paying job later on. | 1 | **.66*** | -.01 | .02 | .08 | .04 | .05 |
| In order to obtain a more prestigious job later on. | 8 | **.56*** | .35* | -.03 | .06 | -.03 | .01 |
| Because I want to have "the good life" later on. | 15 | **.70*** | .05 | .21* | -.08 | .00 | -.01 |
| In order to have a better salary later on. | 22 | **.79*** | .13 | .04 | -.02 | -.04 | -.03 |
| Because I think that a university education will help me better prepare for the career I have chosen. | 3 | .06 | **.69*** | -.05 | .07 | -.12* | -.04 |
| Because eventually it will enable me to enter the job market in a field that I like. | 10 | -.01 | **.86*** | -.01 | -.14 | .02 | -.04 |
| Because this will help me make a better choice regarding my career orientation. | 17 | .15* | **.60*** | .12* | -.03 | .07 | -.01 |
| Because I believe that a few additional years of education will improve my competence as a worker. | 24 | .19* | **.43*** | .21* | .11 | .00 | .06 |
| To prove to myself that I am capable of completing my university degree. | 7 | .12 | .12 | .39* | .21* | -.03 | .00 |
| Because of the fact that when I succeed at university I feel important. | 14 | .26* | -.04 | **.71*** | -.14 | .07 | -.04 |
| Because I want to show myself that I can succeed in my studies. | 28 | .07 | .03 | **.75*** | .24* | -.21* | .01 |
| To show myself that I am an intelligent person. | 21 | .14 | -.03 | **.78*** | .00 | .01 | .06 |
| Because I experience pleasure and satisfaction while learning new things. | 2 | .14 | .08 | -.10 | **.79*** | .00 | -.02 |
| For the pleasure I experience when I discover new things never seen before. | 9 | .11 | -.06 | -.01 | **.77*** | .12* | .01 |
| For the pleasure that I experience in broadening my knowledge about subjects which appeal to me. | 16 | -.09 | .14* | .20* | **.60*** | .04 | -.05 |
| Because my studies allow me to continue to learn about many things that interest me. | 23 | -.06 | .23* | .22* | **.53*** | .04 | -.03 |
| For the "high" feeling that I experience while reading about various interesting subjects. | 25 | -.10* | .16* | .16* | .09 | **.64*** | .03 |
| For the pleasure that I experience when I read interesting authors. | 11 | .03 | -.03 | -.09 | .12* | **.78*** | -.01 |
| For the pleasure that I experience when I feel completely absorbed by what certain authors have written. | 18 | .01 | .01 | .05 | -.01 | **.92*** | -.01 |
| For the intense feelings I experience when I am communicating my own ideas to others. | 4 | .18* | -.01 | .00 | .33* | .39* | .02 |
| For the pleasure I experience while surpassing myself in my studies. | 6 | .01 | -.08 | .19* | .39* | .03 | .02 |
| For the pleasure that I experience while I am surpassing myself in one of my personal accomplishments. | 13 | -.07 | .01 | **.47*** | **.47*** | .00 | -.05 |
| For the satisfaction I feel when I am in the process of accomplishing difficult academic activities. | 20 | -.12* | .03 | **.51*** | **.43*** | .02 | .02 |
| Because university allows me to experience a personal satisfaction in my quest for excellence in my studies. | 27 | -.02 | -.05 | **.49*** | **.43*** | .10* | -.05 |
| Honestly, I don't know; I really feel that I am wasting my time at university. | 5 | .02 | -.01 | -.02 | -.12* | .04 | **.69*** |
| I once had good reasons for going to university, however, now I wonder whether I should continue. | 12 | .02 | .06 | -.02 | -.12 | .13* | **.69*** |
| I can't see why I go to university and frankly, I couldn't care less. | 19 | -.01 | -.10 | .00 | .00 | -.01 | **.80*** |
| I don't know; I can't understand what I am doing at university. | 26 | -.03 | -.02 | .02 | .07 | -.08* | **.92*** |

*Note*. Coefficients $\lambda > .4$ embold, $*p < .05$

Table 4.7 – EFA factor loadings on split 1 for the reduced AMS

| Item | No | F1 | F2 | F3 | F4 | F5 | F6 |
|---|---|---|---|---|---|---|---|
| Because with only a high-school degree I would not find a high-paying job later on. | 1 | **.66*** | -.03 | .03 | .04 | .05 | .05 |
| In order to obtain a more prestigious job later on. | 8 | **.61*** | .30* | -.05 | .06 | -.01 | .01 |
| Because I want to have "the good life" later on. | 15 | **.65*** | .05 | .26* | -.08 | -.01 | -.01 |
| In order to have a better salary later on. | 22 | **.80*** | .09 | .07 | -.01 | -.06 | -.03 |
| Because I think that a university education will help me better prepare for the career I have chosen. | 3 | .07 | **.65*** | -.04 | .12 | -.14* | -.04 |
| Because eventually it will enable me to enter the job market in a field that I like. | 10 | -.01 | **.89*** | -.02 | -.13 | .02 | -.03 |
| Because this will help me make a better choice regarding my career orientation. | 17 | .16* | **.58*** | .12* | .01 | .07 | -.02 |
| Because I believe that a few additional years of education will improve my competence as a worker. | 24 | .18* | **.40*** | .19* | .17* | -.01 | .06 |
| Because of the fact that when I succeed at university I feel important. | 14 | .17* | -.03 | **.73*** | -.06 | .08 | -.05 |
| Because I want to show myself that I can succeed in my studies. | 28 | .01 | .01 | **.69*** | .35* | -.16* | -.01 |
| To show myself that I am an intelligent person. | 21 | .04 | -.02 | **.78*** | .09 | .04 | .05 |
| Because I experience pleasure and satisfaction while learning new things. | 2 | .11 | .02 | -.10 | **.74*** | .03 | -.03 |
| For the pleasure I experience when I discover new things never seen before. | 9 | .07 | -.15* | -.01 | **.83*** | .10 | .02 |
| For the pleasure that I experience in broadening my knowledge about subjects which appeal to me. | 16 | -.13* | .07 | .18* | **.69*** | .03 | -.04 |
| Because my studies allow me to continue to learn about many things that interest me. | 23 | -.10 | .16* | .21* | **.64*** | .02 | -.02 |
| For the "high" feeling that I experience while reading about various interesting subjects. | 25 | -.13* | .15* | .14* | .12 | **.64*** | .03 |
| For the pleasure that I experience when I read interesting authors. | 11 | .03 | -.06 | -.10* | .11 | **.78*** | -.01 |
| For the pleasure that I experience when I feel completely absorbed by what certain authors have written. | 18 | .02 | .00 | .02 | -.03 | **.96*** | -.02 |
| Honestly, I don't know; I really feel that I am wasting my time at university. | 5 | .01 | .04 | -.01 | -.16* | .04 | **.69*** |
| I once had good reasons for going to university, however, now I wonder whether I should continue. | 12 | .03 | .04 | -.01 | -.07 | .09 | **.70*** |
| I can't see why I go to university and frankly, I couldn't care less. | 19 | -.01 | -.08 | -.01 | -.02 | -.01 | **.80*** |
| I don't know; I can't understand what I am doing at university. | 26 | -.02 | -.03 | .01 | .09* | -.09* | **.91*** |

*Note*. Coefficients $\lambda > .4$ embold, $*p < .05$

Table 4.8 – ESEM factor loadings for gender using split 2 of the AMS data

| Subscale | Item | Factor 1 | | | Factor 2 | | | Factor 3 | | | Factor 4 | | | Factor 5 | | | Factor 6 | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | T | M | F | T | M | F | T | M | F | T | M | F | T | M | F | T | M | F |
| EM External | 22 | .81 | .76 | .85 | -.02 | .03 | .03 | .11 | -.15 | -.17 | -.01 | .13 | .13 | -.11 | .01 | .01 | .02 | .00 | .00 |
| EM External | 15 | .50 | .55 | .57 | .04 | .39 | .35 | .44 | -.14 | -.14 | -.06 | .00 | .00 | -.07 | -.06 | -.05 | .03 | .03 | .03 |
| EM External | 1 | .56 | .60 | .57 | -.11 | .00 | .00 | .14 | .12 | .12 | -.05 | -.04 | -.03 | .16 | -.02 | -.01 | .06 | .05 | .04 |
| EM External | 8 | .70 | .65 | .65 | .10 | -.02 | -.02 | -.02 | .02 | .02 | .06 | .31 | .27 | .03 | .08 | .07 | .01 | -.01 | .00 |
| EM Identified | 10 | .46 | .31 | .33 | .20 | -.05 | -.04 | -.20 | .01 | .01 | .19 | .42 | .39 | .01 | .20 | .18 | -.13 | -.15 | -.15 |
| EM Identified | 3 | .26 | .13 | .14 | .23 | .02 | .02 | -.17 | -.05 | -.05 | .31 | .39 | .36 | -.05 | .31 | .27 | -.19 | -.22 | -.21 |
| EM Identified | 17 | .03 | .00 | .00 | 1.05 | .54 | .53 | .04 | .01 | .01 | -.03 | .76 | .75 | .04 | -.05 | -.04 | .02 | .00 | .00 |
| EM Identified | 24 | .31 | .31 | .29 | .19 | .28 | .23 | .16 | .04 | .04 | .14 | .22 | .18 | .07 | .14 | .11 | -.03 | -.03 | -.03 |
| EM Introjected | 28 | -.02 | -.01 | -.01 | .17 | .65 | .70 | .50 | -.18 | -.22 | .37 | .03 | .04 | -.12 | .27 | .28 | .06 | .08 | .09 |
| EM Introjected | 21 | .13 | .19 | .21 | -.02 | .57 | .55 | .59 | .00 | .00 | .19 | -.14 | -.14 | .07 | .15 | .14 | -.04 | -.01 | -.01 |
| EM Introjected | 14 | .09 | .23 | .23 | .00 | .71 | .62 | .76 | .04 | .04 | .04 | -.24 | -.21 | .12 | .00 | .00 | -.07 | -.03 | -.03 |
| IM Know | 2 | .06 | .05 | .06 | -.08 | -.08 | -.07 | -.04 | .20 | .21 | .60 | -.02 | -.02 | .21 | .65 | .59 | .03 | .02 | .02 |
| IM Know | 9 | -.01 | -.01 | -.01 | -.04 | .04 | .04 | .02 | .17 | .17 | .62 | -.03 | -.02 | .18 | .65 | .56 | .00 | .00 | .00 |
| IM Know | 16 | -.12 | -.13 | -.13 | .02 | .34 | .30 | .20 | .01 | .01 | .80 | -.02 | -.02 | .02 | .75 | .63 | -.03 | -.03 | -.03 |
| IM Know | 23 | .06 | .03 | .03 | .02 | .18 | .16 | .08 | .04 | .04 | .67 | .05 | .04 | .06 | .67 | .57 | .01 | .00 | .00 |
| IM Experience | 18 | -.05 | -.04 | -.04 | .04 | .03 | .03 | .04 | .89 | .88 | .03 | .03 | .02 | .86 | .01 | .01 | .08 | .11 | .10 |
| IM Experience | 11 | .04 | .03 | .03 | -.02 | -.16 | -.14 | -.10 | .93 | .94 | -.02 | .01 | .01 | .91 | -.01 | -.01 | -.04 | -.02 | -.02 |
| IM Experience | 25 | -.04 | .00 | .00 | .04 | .16 | .14 | .15 | .69 | .70 | .11 | -.03 | -.03 | .70 | .09 | .07 | -.01 | .01 | .01 |
| Amotivation | 26 | -.01 | -.03 | -.03 | .02 | .01 | .01 | -.03 | .00 | .00 | .04 | .05 | .05 | -.02 | .02 | .01 | .79 | .84 | .76 |
| Amotivation | 19 | .01 | -.01 | -.01 | .00 | -.04 | -.03 | -.04 | .01 | .01 | .02 | .03 | .03 | -.01 | .03 | .03 | .77 | .77 | .78 |
| Amotivation | 5 | .00 | .01 | .01 | .01 | .02 | .02 | .03 | .10 | .10 | -.12 | -.02 | -.02 | .09 | -.13 | -.11 | .70 | .73 | .69 |
| Amotivation | 12 | .03 | .04 | .04 | -.03 | -.02 | -.01 | .01 | -.03 | -.03 | .01 | -.03 | -.03 | -.04 | .01 | .01 | .81 | .84 | .77 |

### 4.4.2 Factor Structure of the SCEQ

**Descriptive Statistics**

Descriptive statistics of means, medians, standard deviations (SD), standard error (SE), and variance (Var) for each item in the SCEQ are presented in Table 4.9. Item correlations are presented in Table 4.10. Results showed that items within the four subscales were significantly correlated with each other. These included skills engagement (measured by items 1 – 9), emotional engagement (measured by items 10 – 14), participation engagement (measured by items 15 – 20), and performance engagement (measured by items 21– 23). Since items within the SCEQ were designed to measure students' engagement, items were expected to significantly correlate above the recommended 0.40 (Kim & Muller, 1978); however, all correlation values were not high enough to suggest redundancy (all values < 0.8). This means that the correlations between the items were suitable enough to continue with the next part of the analysis; in other words, there was no reason to suggest redundancy of any of the items at this point.

Table 4.9 – Descriptive statistics of the SCEQ items

| Item | Mean | Median | SD | SE | Var |
|---|---|---|---|---|---|
| 1. Making sure to study on a regular basis | 3.46 | 3.00 | 1.02 | .04 | 1.04 |
| 2. Putting forth the effort | 3.91 | 4.00 | .90 | .03 | .81 |
| 3. Doing all the assignments | 4.61 | 5.00 | .70 | .02 | .50 |
| 4. Staying up on the readings | 3.17 | 3.00 | 1.10 | .04 | 1.21 |
| 5. Looking over class notes between classes to make sure I understand the material | 3.20 | 3.00 | 1.11 | .04 | 1.22 |
| 6. Being organized | 3.85 | 4.00 | 1.14 | .04 | 1.30 |
| 7. Taking good notes in class | 3.99 | 4.00 | 1.03 | .04 | 1.06 |
| 8. Listening carefully in class | 4.19 | 4.00 | .79 | .03 | .63 |
| 9. Coming to class every day | 4.30 | 5.00 | .92 | .03 | .85 |
| 10. Finding ways to make the course material relevant to my life | 3.42 | 3.00 | 1.05 | .04 | 1.09 |
| 11. Applying course material to my life | 3.40 | 3.00 | 1.06 | .04 | 1.13 |
| 12. Finding ways to make the course interesting to me | 3.73 | 4.00 | .92 | .03 | .84 |
| 13. Thinking about the course between class meetings | 3.80 | 4.00 | 1.03 | .04 | 1.05 |
| 14. Really desiring to learn the material | 3.85 | 4.00 | .96 | .03 | .92 |
| 15. Raising my hand in class | 3.33 | 3.00 | 1.34 | .05 | 1.79 |
| 16. Asking questions when I don’t understand | 3.58 | 4.00 | 1.21 | .04 | 1.47 |
| 17. Having fun in class | 3.75 | 4.00 | .92 | .03 | .84 |
| 18. Participating actively in small-group discussions | 4.06 | 4.00 | .87 | .03 | .76 |
| 19. Going to the tutor’s office hours to review assignments or tests or to ask questions | 2.96 | 3.00 | 1.19 | .04 | 1.42 |
| 20. Helping fellow students | 4.05 | 4.00 | .85 | .03 | .72 |
| 21. Getting a good grade | 3.96 | 4.00 | .78 | .03 | .62 |
| 22. Doing well on exams | 3.56 | 4.00 | .99 | .03 | .98 |
| 23. Being confident that I can learn and do well in the class | 3.70 | 4.00 | .98 | .03 | .97 |

Table 4.10 – Item correlations of the SCEQ

| | Subscale | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | Skills Eng | 1 | | | | | | | | | | | |
| 2 | Skills Eng | .66** | 1 | | | | | | | | | | |
| 3 | Skills Eng | .33** | .45** | 1 | | | | | | | | | |
| 4 | Skills Eng | .64** | .48** | .27** | 1 | | | | | | | | |
| 5 | Skills Eng | .56** | .47** | .25** | .60** | 1 | | | | | | | |
| 6 | Skills Eng | .54** | .47** | .40** | .41** | .42** | 1 | | | | | | |
| 7 | Skills Eng | .44** | .38** | .33** | .40** | .44** | .46** | 1 | | | | | |
| 8 | Skills Eng | .37** | .38** | .34** | .32** | .34** | .28** | .45** | 1 | | | | |
| 9 | Skills Eng | .31** | .35** | .32** | .23** | .22** | .33** | .26** | .36** | 1 | | | |
| 10 | Emotional Eng | .38** | .31** | .14** | .39** | .36** | .23** | .22** | .33** | .25** | 1 | | |
| 11 | Emotional Eng | .36** | .30** | .15** | .33** | .31** | .26** | .20** | .28** | .24** | .79** | 1 | |
| 12 | Emotional Eng | .38** | .38** | .26** | .39** | .41** | .27** | .28** | .40** | .27** | .61** | .61** | 1 |
| 13 | Emotional Eng | .45** | .42** | .30** | .37** | .43** | .28** | .35** | .42** | .31** | .46** | .46** | .59** |
| 14 | Emotional Eng | .49** | .51** | .29** | .45** | .46** | .29** | .39** | .45** | .30** | .45** | .44** | .53** |
| 15 | Participation Eng | .22** | .25** | .16** | .22** | .22** | .11** | .15** | .27** | .20** | .34** | .32** | .30** |
| 16 | Participation Eng | .25** | .30** | .19** | .20** | .25** | .19** | .16** | .28** | .26** | .31** | .30** | .29** |
| 17 | Participation Eng | .13** | .22** | .15** | .11** | .12** | .09** | .10** | .22** | .18** | .25** | .21** | .35** |
| 18 | Participation Eng | .17** | .22** | .25** | .19** | .18** | .19** | .18** | .25** | .19** | .28** | .29** | .34** |
| 19 | Participation Eng | .30** | .28** | .16** | .29** | .26** | .22** | .16** | .16** | .18** | .30** | .29** | .33** |
| 20 | Participation Eng | .27** | .31** | .32** | .24** | .19** | .27** | .23** | .29** | .26** | .21** | .22** | .32** |
| 21 | Performance Eng | .34** | .37** | .32** | .27** | .24** | .29** | .29** | .26** | .25** | .22** | .22** | .31** |
| 22 | Performance Eng | .28** | .26** | .19** | .18** | .22** | .21** | .22** | .26** | .22** | .19** | .19** | .23** |
| 23 | Performance Eng | .19** | .20** | .17** | .16** | .14** | .16** | .15** | .23** | .19** | .25** | .21** | .32** |

*Note*. ** $p < 0.01$, * $p < 0.05$.

Table 4.10 – Item correlations of the SCEQ (Continued)

| | Subscale | 13 | 14 | 15 | 16 | 17 | 18 | 19 | 20 | 21 | 22 | 23 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 13 | Emotional Eng | 1 | | | | | | | | | | |
| 14 | Emotional Eng | .67** | 1 | | | | | | | | | |
| 15 | Participation Eng | .30** | .37** | 1 | | | | | | | | |
| 16 | Participation Eng | .25** | .32** | .71** | 1 | | | | | | | |
| 17 | Participation Eng | .19** | .23** | .43** | .46** | 1 | | | | | | |
| 18 | Participation Eng | .28** | .27** | .49** | .47** | .50** | 1 | | | | | |
| 19 | Participation Eng | .32** | .29** | .31** | .34** | .27** | .29** | 1 | | | | |
| 20 | Participation Eng | .30** | .32** | .33** | .36** | .35** | .44** | .30** | 1 | | | |
| 21 | Performance Eng | .22** | .32** | .24** | .31** | .29** | .26** | .26** | .40** | 1 | | |
| 22 | Performance Eng | .23** | .24** | .25** | .28** | .23** | .17** | .22** | .25** | .64** | 1 | |
| 23 | Performance Eng | .19** | .25** | .37** | .43** | .40** | .37** | .22** | .34** | .56** | .50** | 1 |

*Note*. ** $p < 0.01$, * $p < 0.05$.

**Exploratory and Confirmatory Factor Analyses**

Factor analyses were used to assess the adequacy of a previously-established 4-factor model by the authors (Handelsman, Briggs, Sullivan, & Towler, 2005). An EFA was conducted on split 2 using M*plus* (Muthén & Muthén, 2012). Table 4.11 represents a summary of fit indices of EFA on split 2 of the data. These results showed that the data inadequately fitted the 1-factor, 2-factor, and 3-factor models. Examination of the fit indices also indicated that the data inadequately fitted the 4-factor model: $\chi^2(167) = 516.94$, $p < .001$, CFI = .919, TLI = .878, RMSEA = .070, and SRMR = .036, which contradicted the claims made by the authors of this instrument. Further investigation of the factor structure of the 4-factor model revealed that 6 items had factor loading <0.4 (items 8, 13, 14, 18, 19, and 20). Table 4.12 shows the standardised factor loadings from EFA on split 2 of the data.

Table 4.11 – EFA model fit indices on split 2 of the SCEQ

| Model | $\chi^2$ (df) | CFI | TLI | RMSEA | SRMR |
|---|---|---|---|---|---|
| 1-Factor | 1766.68 (230) | .646 | .611 | .126 | .086 |
| 2-Factor | 1268.01 (208) | .756 | .703 | .110 | .062 |
| 3-Factor | 857.72 (187) | .846 | .791 | .092 | .048 |
| 4-Factor | 516.94 (167) | .919 | .878 | .070 | .036 |

*Note*. All $\chi^2$ statistics $p$ <.001

As recommended by Allen, Titsworth, and Hunt (2009), a predetermined criterion that requires a primary loading of 0.60 and no secondary loading higher than 0.40 was adopted in the reduction of the scale. As a result, the scale was reduced to: 6 items (1, 2, 4, 5, 6 and 7) in the first subscale (Skills Engagement); 3 items (10, 11 and 12) in the second subscale (Emotional Engagement); 2 items (15 and 16) in the third subscale

(Participation Engagement); and 3 items (21, 22, and 23) in the fourth subscale (Performance Engagement). A further reduction of item 7 and the inclusion of item 18 were necessary to establish adequate fit on both splits since recommendations suggest obtaining adequate internal consistency reliabilities with as few as three items (Cook, Hepworth, Wall, & Warr, 1981) for any subscale.

An EFA of the reduced scale on split 2 showed good fit to the data: $\chi^2(41) = 81.55$, $p < .001$, CFI = .986, TLI = .968, RMSEA = .048, and SRMR = .018. Table 4.13 shows the standardised factor loadings form EFA on split 2 of the data for the reduced scale. A version of the reduced scale is found in Appendix Four. Also, a CFA of the reduced scale showed adequate fit to the data for split 1: $\chi^2(71) = 223.62$, $p < .001$, CFI = .927, TLI = .907, RMSEA = .071, and SRMR = .057; and split 2: $\chi^2(71) = 177.01$, $p < .001$, CFI = .954, TLI = .941, RMSEA = .059, and SRMR = .050. In summary, the data collected using the reduced scale were used in the analyses of this study.

A multi-group ESEM for gender on split 2 (which only included males and females due to sample size constraints as highlighted earlier in this chapter) showed adequate fit to the data: $\chi^2(132) = 179.45$, $p < .001$, CFI = .980, TLI = .972, RMSEA = .042, and SRMR = .042. Factor loadings for the total sample and for male and female participants are shown in Table 4.14. Results indicated that the difference in the factors were small across gender. In other words, the scale could be used to collect data from both genders.

Table 4.12 – EFA factor loadings for split 2 of the initial SCEQ (four factor)

| Item | | Subscale | F1 | F2 | F3 | F4 |
|---|---|---|---|---|---|---|
| 1. | Making sure to study on a regular basis | Skills Eng | **.81*** | .04 | -.04 | -.03 |
| 2. | Putting forth the effort | Skills Eng | **.70*** | -.06 | .07 | .07 |
| 3. | Doing all the assignments | Skills Eng | .45**** | -.16* | .02 | .20* |
| 4. | Staying up on the readings | Skills Eng | **.64*** | .10 | .09 | -.11* |
| 5. | Looking over class notes between classes to make sure I understand the material | Skills Eng | **.64*** | .18* | -.04 | -.07 |
| 6. | Being organized | Skills Eng | **.64*** | -.02 | -.05 | .03 |
| 7. | Taking good notes in class | Skills Eng | **.61*** | -.01 | -.11 | .03 |
| 8. | Listening carefully in class | Skills Eng | .37* | .15* | .08 | .03 |
| 9. | Coming to class every day | Skills Eng | .42* | .02 | .05 | .10 |
| 10. | Finding ways to make the course material relevant to my life | Emotional Eng | .02 | **.90*** | -.03 | -.01 |
| 11. | Applying course material to my life | Emotional Eng | .01 | **.86*** | .03 | -.01 |
| 12. | Finding ways to make the course interesting to me | Emotional Eng | .09 | **.65*** | .02 | .11* |
| 13. | Thinking about the course between class meetings | Emotional Eng | .33* | .31* | .07 | .01 |
| 14. | Really desiring to learn the material | Emotional Eng | .42* | .24* | .09 | .10 |
| 15. | Raising my hand in class | Participation Eng | .03 | .01 | **.84*** | -.07 |
| 16. | Asking questions when I don't understand | Participation Eng | .05 | -.08 | **.90*** | .01 |
| 17. | Having fun in class | Participation Eng | -.01 | .17* | .44* | .09 |
| 18. | Participating actively in small-group discussions | Participation Eng | -.04 | .18* | .39* | .18* |
| 19. | Going to the tutor's office hours to review assignments or tests or to ask questions | Participation Eng | .22* | .19* | .23* | .04 |
| 20. | Helping fellow students | Participation Eng | .16 | .08 | .20* | .25* |
| 21. | Getting a good grade | Performance Eng | .16 | -.02 | -.05 | **.83*** |
| 22. | Doing well on exams | Performance Eng | .14 | -.01 | .01 | **.71*** |
| 23. | Being confident that I can learn and do well in the class | Performance Eng | -.11 | .12* | .22* | **.62*** |

*Note*. Coefficients $\lambda > .6$ embold, $*p < .05$

Table 4.13 – EFA factor loadings of the reduced SCEQ using split 2

| Item | No | Subscale | F1 | F2 | F3 | F4 |
|---|---|---|---|---|---|---|
| Making sure to study on a regular basis | 1 | Skills Eng | **.85*** | .02 | -.02 | .02 |
| Putting forth the effort | 2 | Skills Eng | **.65*** | -.04 | .09* | .13* |
| Staying up on the readings | 4 | Skills Eng | **.61*** | .19* | -.02 | -.02 |
| Looking over class notes between classes to make sure I understand the material | 5 | Skills Eng | **.59*** | .11* | .12* | -.04 |
| Being organized | 6 | Skills Eng | **.58*** | .00 | -.02 | .08 |
| Finding ways to make the course material relevant to my life | 10 | Emotional Eng | .02 | **.90*** | -.02 | -.00 |
| Applying course material to my life | 11 | Emotional Eng | .02 | **.86*** | .04 | -.00 |
| Finding ways to make the course interesting to me | 12 | Emotional Eng | .03 | **.64*** | .01 | .14* |
| Raising my hand in class | 15 | Participation Eng | .02 | .06 | **.79*** | -.03 |
| Asking questions when I don't understand | 16 | Participation Eng | .05 | -.06* | **.93*** | .02 |
| Participating actively in small-group discussions | 18 | Participation Eng | -.04 | .20* | **.40*** | .10 |
| Getting a good grade | 21 | Performance Eng | .09* | -.01 | -.04 | **.84*** |
| Doing well on exams | 22 | Performance Eng | .07* | -.03 | .00 | **.78*** |
| Being confident that I can learn and do well in the class | 23 | Performance Eng | -.14* | .11* | .21* | **.64*** |

*Note*. Coefficients $\lambda > .4$ embold, $*p < .05$

Table 4.14 – ESEM factor loadings for gender using split 2 of the SCEQ data

| Subscale | No | Factor 1 | | | Factor 2 | | | Factor 3 | | | Factor 4 | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | T | M | F | T | M | F | T | M | F | T | M | F |
| Skills Eng | 1 | .85 | .88 | .84 | .02 | .01 | .01 | -.02 | -.03 | -.03 | .02 | .02 | .02 |
| Skills Eng | 2 | .65 | .71 | .63 | -.04 | -.05 | -.05 | .09 | .07 | .08 | .13 | .13 | .12 |
| Skills Eng | 4 | .61 | .64 | .57 | .19 | .19 | .17 | -.02 | .00 | -.01 | -.02 | -.03 | -.03 |
| Skills Eng | 5 | .59 | .64 | .58 | .11 | .09 | .08 | .12 | .14 | .15 | -.04 | -.05 | -.05 |
| Skills Eng | 6 | .58 | .61 | .60 | .00 | -.02 | -.02 | -.02 | -.02 | -.02 | .08 | .07 | .08 |
| Emotional Eng | 10 | .02 | .02 | .02 | .90 | .93 | .88 | -.02 | -.03 | -.03 | .00 | .00 | .00 |
| Emotional Eng | 11 | .02 | .01 | .01 | .86 | .84 | .86 | .04 | .04 | .04 | .00 | .01 | .01 |
| Emotional Eng | 12 | .03 | .05 | .05 | .64 | .66 | .61 | .01 | .03 | .03 | .14 | .14 | .14 |
| Participation Eng | 15 | .02 | -.01 | -.01 | .06 | .05 | .05 | .79 | .80 | .84 | -.03 | -.03 | -.03 |
| Participation Eng | 16 | .05 | .04 | .04 | -.06 | -.07 | -.06 | .93 | .89 | .92 | .02 | .04 | .04 |
| Participation Eng | 18 | -.04 | -.05 | -.05 | .20 | .21 | .20 | .40 | .37 | .41 | .10 | .11 | .11 |
| Performance Eng | 21 | .09 | .20 | .18 | -.01 | -.02 | -.02 | -.04 | -.04 | -.04 | .84 | .81 | .79 |
| Performance Eng | 22 | .07 | .16 | .15 | -.03 | -.02 | -.02 | .00 | -.01 | -.01 | .78 | .75 | .75 |
| Performance Eng | 23 | -.14 | -.09 | -.08 | .11 | .14 | .12 | .21 | .21 | .21 | .64 | .64 | .59 |

### 4.4.3 Summary of Findings of the Factor Analyses

In summary, examining the PFAI–S instrument showed excellent fit to the data and good internal consistency; therefore, there was no need to subject this instrument to any further investigations. However, on assessing the structural evidence of construct validity of AMS and SCEQ instruments, findings revealed that the original versions of both scales did not show the same factor structure that was claimed by their authors. Further analyses provided two reduced scales (see Appendix Three and Appendix Four for a copy of the reduced scales) for measuring academic motivation and engagement that showed good fit to the data. Data collected from the reduced scales were used in the analyses conducted in this study.

## 4.5 Defining the Variables

Examining the factor structure of the instruments involved resulted in the reduction of the variables and the number of items representing each variable; hence there was a need to redefine the variables involved in the next part of the analysis. Academic motivation was measured by six subscales: intrinsic motivation – to know (measured by items 2, 9, 16 and 23); intrinsic motivation – to experience stimulation (measured by items 11, 18, and 25); extrinsic motivation – identified regulation (measured by items 3, 10, 17, and 24); extrinsic motivation – introjected regulation (measured by items 14, 21, and 28); extrinsic motivation – external regulation (measured by items 1, 8, 15, and 22); and amotivation (measured by items 5, 12, 19 and 26).

Engagement was measured by four subscales: skills engagement (measured by items 1, 2, 4, 5, and 6); emotional engagement (measured by items 10, 11, and 12); participation engagement (measured by items 15, 16, and 18); and performance engagement

(measured by items 21, 22, and 23). A total score of the items was calculated and used in the different statistical tests. Fear of failure remained unchanged, as it was not involved in the factor analyses. Table 4.15 summarises the descriptive statistics of the variables involved in this study, which included: means; median; SD; SE; and Var. All descriptive values were found to be reasonable and within expectations.

Table 4.15 – Descriptive statistics of the variables

| Variables | | Mean | Median | SD | SE | Var |
|---|---|---|---|---|---|---|
| Engagement | Skills Eng | 17.59 | 18 | 4.14 | .14 | 17.17 |
| | Emotional Eng | 10.56 | 11 | 2.68 | .09 | 7.19 |
| | Participation Eng | 10.97 | 11 | 2.91 | .10 | 8.46 |
| | Performance Eng | 11.22 | 11 | 2.32 | .08 | 5.40 |
| Motivation | EM External | 20.66 | 21 | 5.37 | .18 | 28.82 |
| | EM Identified | 23.41 | 24 | 4.27 | .15 | 18.27 |
| | EM Introjected | 14.56 | 15 | 4.48 | .15 | 20.08 |
| | IM Know | 20.79 | 21 | 4.86 | .17 | 23.60 |
| | IM Experience | 10.92 | 11 | 4.87 | .17 | 23.68 |
| | Amotivation | 7.01 | 5 | 4.55 | .16 | 20.69 |
| Fear of Failure | | 15.96 | 16 | 4.73 | .16 | 22.42 |

### 4.5.1 Correlations between the Variables

In terms of correlation between the variables, fear of failure was positively correlated with skills engagement ($r = .06\,,\ p > .05$), emotional engagement ($r = .02, p > .05$), extrinsic motivation external ($r = .21, p < .01$), extrinsic motivation identified ($r = .16, p < .01$), extrinsic motivation introjected ($r = .33, p < .01$), intrinsic motivation to know ($r = .08, p < .05$), intrinsic motivation to experience stimulation ($r = .20,\ p < .01$), and amotivation ($r = .11, p < .01$). Fear of failure was negatively correlated with participation engagement ($r = -.15,\ p > .05$), and

performance engagement ($r = -.21, p > .05$). Examining the correlation between the variables established the influence of the variables on each other. The next section examines the reliability of the data. Table 4.16 shows Pearson's correlations among the variables.

Table 4.16 – Correlations between the variables

| Variable | | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | Skills Eng | 1 | | | | | | | | | |
| 2 | Emotional Eng | .48** | 1 | | | | | | | | |
| 3 | Participation Eng | .31** | .41** | 1 | | | | | | | |
| 4 | Performance Eng | .34** | .31** | .42** | 1 | | | | | | |
| 5 | EM External | .09* | -.04 | .08* | .12** | 1 | | | | | |
| 6 | EM Identified | .25** | .12** | .20** | .18** | .58** | 1 | | | | |
| 7 | EM Introjected | .20** | .15** | .16** | .11** | .49** | .42** | 1 | | | |
| 8 | IM Know | .38** | .40** | .34** | .27** | .18** | .43** | .46** | 1 | | |
| 9 | IM Experience | .39** | .40** | .22** | .16** | .04 | .15** | .38** | .59** | 1 | |
| 10 | Amotivation | -.22 | -.15 | -.22 | -.29 | -.01 | -.28 | -.08 | -.27 | .02 | 1 |
| 11 | Fear of failure | .06 | .02 | -.15 | -.21 | .21** | .16** | .33** | .08* | .20** | .11** |

*Note*. ** p< .01, * p< .05.

### 4.5.2 Reliability

The next step was to assess reliability (Gerbing & Anderson, 1988; Hinkin, 1998). Examining the reliability of self-reported instruments, when used as part of the data collection process, is a necessary condition for validity (Nunnally, 1978). Table 4.17 shows the calculated Cronbach's alpha for the subscales of the three instruments and the number of items representing each subscale.

Table 4.17 – Cronbach's alpha coefficients

| Instrument | Subscale | Cronbach's alpha | Number of items |
|---|---|---|---|
| Fear of Failure | FoF | .804 | 5 |
| Engagement | Skills Eng | .843 | 5 |
| | Emotional Eng | .859 | 3 |
| | Participation Eng | .788 | 3 |
| | Performance Eng | .788 | 3 |
| Motivation | EM External | .814 | 4 |
| | EM Identified | .772 | 4 |
| | EM Introjected | .825 | 3 |
| | IM Know | .854 | 4 |
| | IM Experience | .874 | 3 |
| | Amotivation | .852 | 4 |

Eight subscales (which are fear of failure, skills engagement, emotional engagement, extrinsic motivation external, extrinsic motivation introjected, intrinsic motivation to know, intrinsic motivation to experience stimulation and amotivation) had Cronbach's alpha coefficient >0.80 indicating strong relationship between the items within the instrument and suggesting high internal consistency. However, three subscales (participation engagement, performance engagement and extrinsic motivation identified) had values >0.70 suggesting acceptable internal consistency (DeVellis, 2016). These results showed that all the items that were used to probe the same construct in each subscale produced similar results, and hence were reliable to use

(Cronbach, 1951) in the next part of the data analysis. These also confirmed that the reduced scales that were developed as a result of the factor analyses were reliable to use.

### 4.5.3 Validity

To control for validity and in line with Messick's (1994) recommendations (as detailed in chapter 3), the focus was narrowed to structural evidence of validity. Although all scales used in this study were reported by their authors to be valid instruments, nonetheless, their scale structures were examined earlier in this chapter to confirm the factorial validity of their hypothesised structures and provide structural evidence of validity.

## 4.6 Common Method Variance

In line with Podsakoff et al.'s (2003) recommendations to control method bias, two methods were used: protecting respondents' anonymity; and reducing evaluation apprehension by allowing the respondents' answers to be anonymous and appealing to them in the information sheet to answer questions as honestly as possible. The aim was to reduce the respondents' evaluation apprehension and make them less likely to edit their responses to be more socially desirable. Also the use of reverse coding in negative worded questions was avoided.

Moreover, Harman's one factor test and confirmatory factor analysis were conducted to test for the presence of common method variance (Harman, 1967; Podsakoff & Organ, 1986). All 11 factors, from the fear of failure instrument, the reduced AMS instrument and the reduced SCEQ instrument, were entered into an un-rotated, one

factor analysis. Results revealed that only 23.4% of the variance were accounted for by one general factor (< 50%). Also, the 11 factors were loaded on a one confirmatory factor analysis to test if a one factor model fitted the data well (Mossholder, Bennett, Kemery, & Wesolowski, 1998; Podsakoff & Organ, 1986). Results showed that the one factor model did not fit the data well, $\chi^2(820) = 9715.52$, $p < .001$, CFI = .432, TLI = .391, RMSEA = .116, and SRMR = .134. While these results do not exclude the existence of common method variance, they suggest that common method variance is unlikely to impact on the interpretations of the results in this study.

### 4.7 Structural Equation Modelling

This section of the analysis investigated the second research question, that is, the influence of fear of failure on academic motivation and engagement. It examined the direct and indirect relationships between the variables using path analysis. A structural equation model (SEM) was used to test the hypothesised paths presented in Figure 4.4, using items that strongly loaded onto their factors (see Table 4.18). These included paths from fear of failure to extrinsic motivation, intrinsic motivation and amotivation, and from extrinsic motivation, intrinsic motivation and amotivation to the four different types of engagement (skills, participation, performance and emotional).

Table 4.18 – Items used to measure each subscale in the SEM

| Construct | Subscale | Items | Number |
|---|---|---|---|
| Fear of Failure | | FoF_1, FoF_2, FoF_3, FoF_4, FoF_5 | 5 |
| Engagement | Skills | EO_S_1, EO_S_2, EO_S_4, EO_S_5, EO_S_6 | 5 |
| | Emotional | EI_E _10, EI_E_11, EI_E_12 | 3 |
| | Performance | EO_P_21 EO_P_22 EO_P_23 | 3 |
| | Participation | EI_I_15, EI_I_16, EI_I_18 | 3 |
| Motivation | Extrinsic | EM_E_22 EM_ID_10 EM_IN_21 | 3 |
| | Intrinsic | IM_K_9 IM_E_11 IM_E_18 | 3 |
| | Amotivation | AM_5 AM_12 AM_19 AM_26 | 4 |

Analyses were conducted in M*plus* (version 7.3) using the MLR estimator, and the SDTYX command to generate standardised coefficients. The SEM showed good fit of the model to the data: $\chi^2(347) = 1402.42$, $p < .001$, CFI = .960, TLI = .953, RMSEA = .060, and SRMR = .070. Statistically significant paths are reported in Figure 4.5 and are discussed in the sections following.

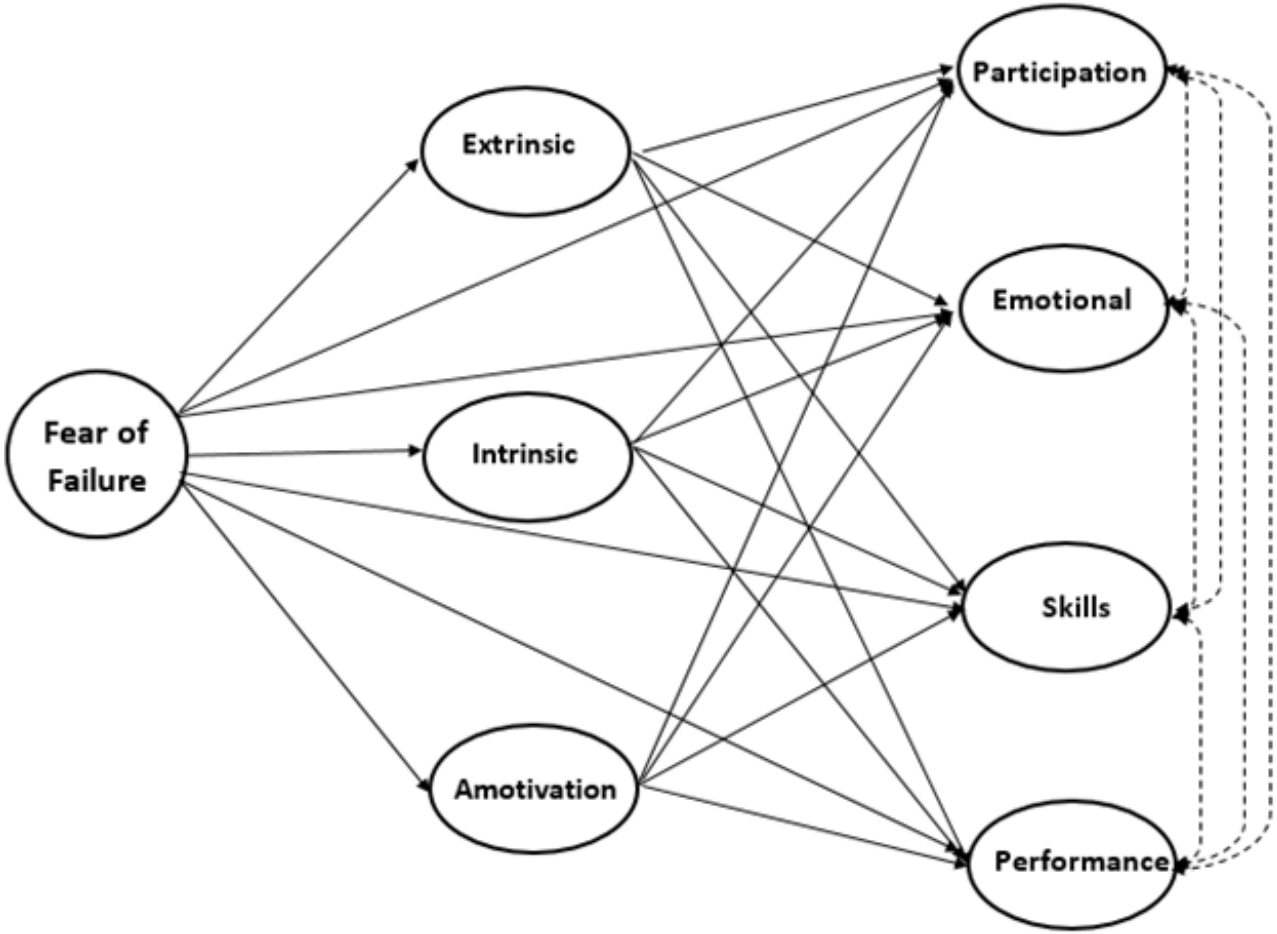


Figure 4.4 – The hypothesised model showing the hypothesised paths.

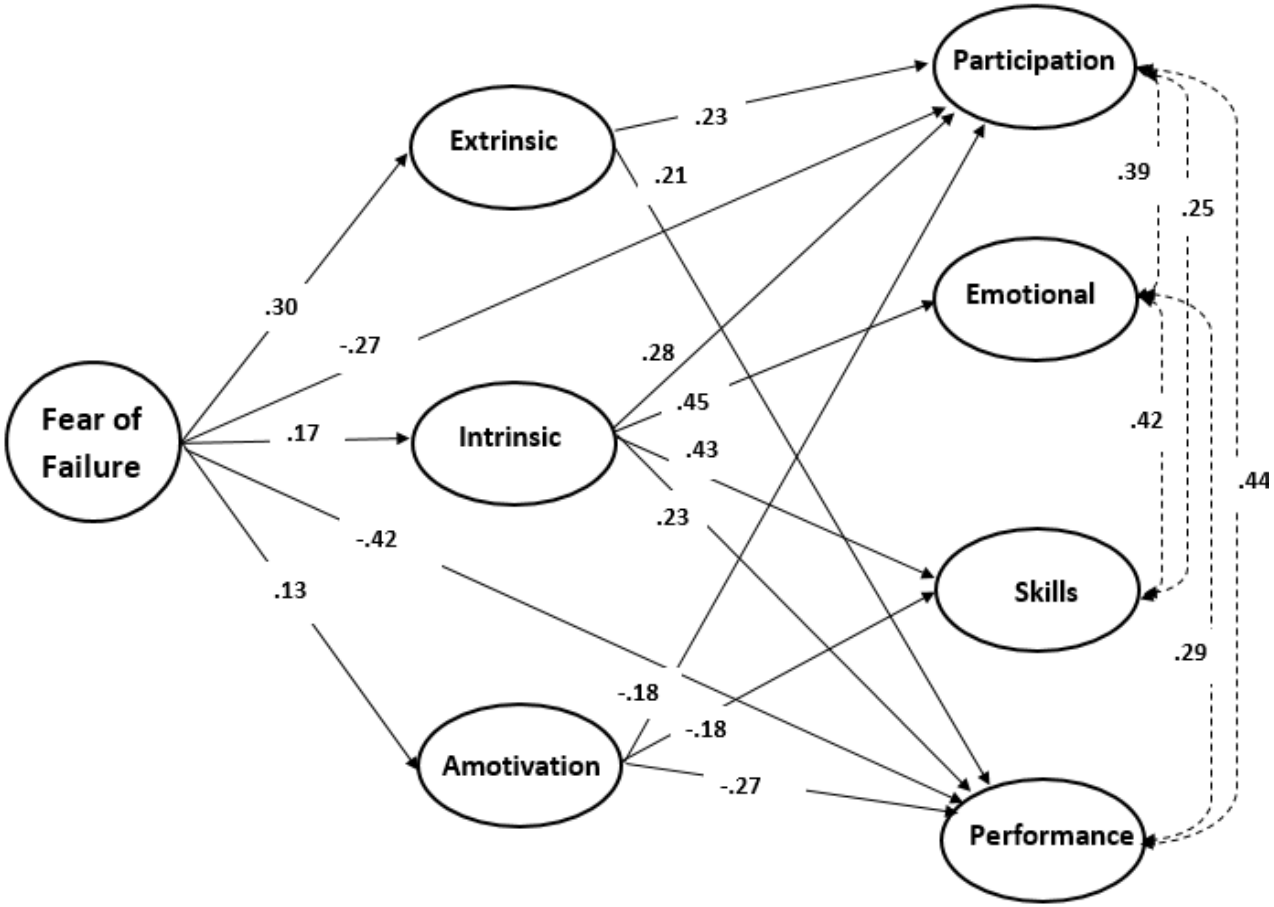


Figure 4.5 – The SEM model showing statistically significant paths. Dotted lines represent significant covariance.

### 4.7.1 Direct Paths from Fear of Failure to Motivation and Engagement

Fear of failure predicted greater extrinsic motivation (β = .30, $p$ <.05), greater intrinsic motivation (β = .17, $p$ <.01), and greater amotivation (β = .13, $p$ <.05). This means that fear of failure has direct positive effect on the intrinsic motivation, extrinsic motivation and amotivation of students. Fear of failure also predicted lower participation engagement (β = -.27, $p$ <.001), and lower performance engagement (β = -.42, $p$ <.001); however, it did not predict either emotional engagement (β = -.03, $p$ =.59) or skills engagement (β < .01, $p$ =.98). This means that, as expected, when students are afraid of failing, they do not participate in the work and subsequently do not perform well. However, students' fear was not significantly linked to either their emotional engagement or their skills engagement.

### 4.7.2 Direct Paths from Motivation to Engagement

Intrinsic motivation predicted greater skills engagement (β = .43, $p$ <.001), greater participation engagement (β = .28, $p$ <.001), greater performance engagement (β = .23, $p$ <.001), and greater emotional engagement (β = .45, $p$ < .001). This means that when students are intrinsically motivated they show significant positive overall engagement (skills engagement, participation engagement, performance engagement and emotional engagement). Extrinsic motivation predicted greater participation engagement (β = .23, $p$ <.001) and greater performance engagement (β = .21, $p$ <.001); however, it did not predict either emotional engagement (β = -.04, $p$ =.05), or skills engagement (β = .12, $p$ = .21). This means that extrinsically motivated students demonstrate greater participation engagement and greater performance engagement; however, they do not demonstrate either skills or emotional engagement. As expected, amotivation predicted lower skills engagement (β = -.18, $p$ <.001), lower participation engagement (β = -.18,

$p$ <.001), and lower performance engagement (β = -.27, $p$ <.01); however, it did not predict emotional engagement (β = -.12, $p$ =.10). This means that amotivated students are not fully engaged.

### 4.7.3 Indirect Paths from Fear of Failure to Engagement

Indirect relationships from fear of failure to engagement were assessed by creating 95% confidence intervals (CIs) around the standardised coefficient in M*plus*. CIs that do not cross zero are statistically significant ($p$ < .05). There were three positive significant indirect paths from fear of failure to engagement via intrinsic motivation. The first one from fear of failure to skills engagement via intrinsic motivation (β = .07, SE = .027, 95% CIs [.021, .126]); the second one from fear of failure to participation engagement via intrinsic motivation (β = .05, SE = .018, 95% CIs [.012, .084]); and the third one from fear of failure to emotional engagement via intrinsic motivation (β = .08, SE = .037, 95% CIs [.005, .149]). This means that in intrinsically motivated students, fear of failure has significant, positive effect on their skills, participation and emotional engagement.

There was also one negative significant indirect path from fear of failure to participation engagement via amotivation (β = -.02, SE = .010, 95% CIs [-.042, -.003]). This means that, as would be expected, fear of failure has a negative impact on the participation engagement of amotivated students. Furthermore, there was one positive significant indirect paths from fear of failure to participation engagement via extrinsic motivation (β = .07, SE = .034, 95% CIs [.002, .134]). All other indirect paths were not statistically significant as 95% CIs crossed zero.

### 4.7.4 Summary of Findings of the SEM Analyses

This section summarises the findings of the SEM analyses, which were used to partly answer the second research question, that is, the influence of fear of failure on academic motivation and engagement. In other words, examining the direct and indirect effects of fear of failure on academic motivation and engagement. Although fear of failure was found to have positive effects on students' intrinsic and extrinsic motivation, it was also found to have strong negative effects on their participation and performance engagement. This means that when students were afraid of failing, they did not participate in the work and did not perform well either. Fear of failure was also found to predict amotivation. Direct effects from motivation to engagement showed that high extrinsic motivation predicted positive participation engagement and positive performance engagement. This means that teachers can use extrinsic motivation in the learning environment to encourage greater participation and performance engagement of students who have high fear of failure.

As would be expected, amotivated students showed lower skills engagement, lower participation engagement and lower performance engagement but not significantly lower emotional engagement. Not surprisingly, intrinsically motivated students showed direct, significant high overall engagement (skills, participation, performance and emotional engagement). High fear of failure had negative indirect effect on the participation engagement of amotivated students; however, it had positive indirect effect on the participation engagement of extrinsically motivated students. On the other hand, high fear of failure had a positive indirect effect on the overall engagement of intrinsically motivated students (skills, participation and emotional engagement).

This means that fear of failure influences the different dimensions of engagement depending on the students' type of motivation that arises at any given time. If students are intrinsically motivated then their high fear of failure will positively influence their overall engagement. If students are extrinsically motivated then their high fear of failure will positively influence their participation engagement; however, if they are amotivated then their fear of failure will negatively influence their participation engagement. These findings highlight the positive and negative effects of fear of failure in light of the complex nature of students' behaviours within the learning environment.

### 4.8 Inferential Statistics

This section of the analysis also answered the second research question, that is, the influence of fear of failure on academic motivation and engagement. Independent samples *t*-tests were conducted on the whole sample, to compare the means of academic motivation and engagement of students with high and low fear of failure.

#### 4.8.1 Fear of Failure Effects on Motivation and Engagement

This section examined if academic motivation and engagement were affected by students' level of fear of failure. An independent samples *t*-test was conducted to compare the means of extrinsic motivation, intrinsic motivation and amotivation of students with high fear of failure and low fear of failure. Results are displayed in Table 4.19. There was significant difference in: the mean extrinsic motivation of students with low fear of failure ($M$ = 55.6, $SD$ = 12.47) and those with high fear of failure ($M$ = 61.0, $SD$ = 10.18); $t(712) = 6.80$ , $p < .001$; the mean intrinsic motivation of students with low fear of failure ($M$ = 30.8, $SD$ = 8.28) and those with high fear of failure ($M$ = 32.4, $SD$ = 8.93); $t(825) = 2.71$, $p < .01$; and the mean amotivation of students with low

fear of failure (*M* = 6.6, *SD* = 4.33) and those with high fear of failure (*M* = 7.4, *SD* = 4.69); *t*(826) = 2.58, *p* = .01. These results suggest that fear of failure significantly affects students' academic motivation and amotivation and they are in line with the results of the SEM model (see section 4.7).

Table 4.19 – Independent samples t-test for fear of failure differences in motivation

| Variable | Group | N | Mean | SD | SE | *t* | df | *p* |
|---|---|---|---|---|---|---|---|---|
| Extrinsic Motivation | Low fear of failure | 374 | 55.6 | 12.47 | .64 | 6.80 | 712 | <.001 |
| | High fear of failure | 476 | 61.0 | 10.18 | .47 | | | |
| Intrinsic Motivation | Low fear of failure | 374 | 30.8 | 8.28 | .43 | 2.71 | 825 | .007 |
| | High fear of failure | 476 | 32.4 | 8.93 | .41 | | | |
| Amotivation | Low fear of failure | 374 | 6.6 | 4.33 | .22 | 2.58 | 826 | .010 |
| | High fear of failure | 476 | 7.4 | 4.69 | .21 | | | |

Independent samples *t*-tests were also conducted to compare the means of skills, emotional, participation and performance engagement of students with high fear of failure and low fear of failure. The aim was to examine if engagement was affected by students' level of fear of failure. Results are displayed in Table 4.20. There was no significant difference in either: the mean skills engagement of students with low fear of failure (*M* = 17.4, *SD* = 4.27) and those with high fear of failure (*M* = 17.8, *SD* = 4.04), *t*(848) = 1.42, *p* >.05; or the mean emotional engagement of students with low fear of failure (*M* = 10.6, *SD* = 2.73) and those with high fear of failure (*M* = 10.6, *SD* = 2.64),

$t(848) = -.03$, $p > .05$. This means that students with high fear of failure have similar mean skills engagement to students with low fear of failure and also students with high fear of failure have somewhat similar mean emotional engagement to students with low fear of failure. These results are in line with the SEM results (see section 4.7).

Table 4.20 – Independent samples t-test for fear of failure differences in engagement

| Variable | Group | N | Mean | SD | SE | *t* | df | *p* |
|---|---|---|---|---|---|---|---|---|
| Skills Engagement | Low fear of failure | 374 | 17.4 | 4.27 | .22 | 1.42 | 848 | .156 |
| | High fear of failure | 476 | 17.8 | 4.04 | .19 | | | |
| Emotional Engagement | Low fear of failure | 374 | 10.6 | 2.73 | .14 | -.03 | 848 | .973 |
| | High fear of failure | 476 | 10.6 | 2.64 | .12 | | | |
| Participation Engagement | Low fear of failure | 374 | 11.5 | 2.70 | .14 | -4.60 | 833 | <.001 |
| | High fear of failure | 476 | 10.6 | 3.01 | .14 | | | |
| Performance Engagement | Low fear of failure | 374 | 11.7 | 2.15 | .11 | -5.04 | 833 | <.001 |
| | High fear of failure | 476 | 10.9 | 2.40 | .11 | | | |

However, results suggested significant difference in both: the mean participation engagement of students with low fear of failure ($M = 11.5$, $SD = 2.70$) and those with high fear of failure ($M = 10.6$, $SD = 3.01$), $t(833) = -4.60$, $p < .001$; and the mean performance engagement of students with low fear of failure ($M = 11.7$, $SD = 2.15$) and those with high fear of failure ($M = 10.9$, $SD = 2.40$), $t(833) = -5.04$, $p < .001$. This means that students with low fear of failure showed more participation engagement than

those with high fear of failure and similarly students with low fear of failure had more performance engagement than those with high fear of failure.

Post hoc power analysis using G*Power software (Faul, Erdfelder, Buchner, & Lang, 2009) for all the significant *t*-tests above revealed adequate power ranging from 0.73 to 0.99. All post hoc power analyses were conducted for a calculated effect size from sample statistics and an $\alpha = 0.05$.

### 4.8.2 Summary of Findings of the Parametric Tests

This section summarises the findings of the parametric tests which were used to partly answer the second research question, that is, the influence of fear of failure on academic motivation and engagement, in light of Self Determination Theory. Independent samples *t*-tests were conducted to compare the means of both academic motivation (which includes: intrinsic motivation, extrinsic motivation and amotivation), and engagement (which includes: skills, emotional, participation and performance engagement) of students with high fear of failure and low fear of failure. Findings revealed that students with high fear of failure were more extrinsically motivated, intrinsically motivated and amotivated than students with low fear of failure. High fear of failure was found to be associated with either high motivation or high amotivation. Moreover, students with low fear of failure showed more participation engagement and more performance engagement than students with high fear of failure. However, there were no significant differences in the mean skills engagement and emotional engagement of students with high and low fear of failure. Findings of the post hoc power analysis revealed adequate power to all tests conducted and were also in line with the SEM results (see section 4.7).

### 4.9 Latent Cluster Analysis

This section of the analysis examined the third research question, that is, if latent homogenous clusters of students with particular profiles of fear of failure and academic motivation exist and if these clusters were differentially associated with the four dimensions of student engagement (skills, emotional, participation and performance). The analyses were exploratory, since they were conducted without any pre-conceived ideas about the number of clusters that might emerge. The mean scores of the items that strongly loaded onto their factors in the factor analyses for the constructs under investigation (which are fear of failure, extrinsic motivation, intrinsic motivation, participation, emotional, skills and performance engagement) were used in this section of the analysis. The association of the different clusters with student engagement was established based on the sample mean ($M = 3.60$).

Hierarchical clustering was conducted, and the order of the objects was changed several times because this type of clustering suffers from a non-uniqueness problem (Sarstedt & Mooi, 2014). Results suggested a range of possible solutions which included: three-cluster; four-cluster; or five-cluster solutions. As suggested by Calinski and Harabasz (1974) VRC was computed by allowing SPSS software (version 25.0) (IBM Corp., 2019) to randomly select the initial cluster centres. Next, $\omega_k$ was calculated using the formula: $\omega_k = (VRC_{k+1} - VRC_k) - (VRC_k - VRC_{k-1})$, where $k$ is the number of clusters. VRC and $\omega_k$ values are reported in Table 4.21 and confirm that the lowest value of $\omega_k$ is for the four-cluster solution. Pairwise comparisons, using the cluster membership created from the hierarchical clustering as the fixed variable and the mean scores of fear of failure and academic motivation as the dependent variables, showed significant differences among all four clusters.

Table 4.21 – VRC and $\omega_k$ values

| Number of clusters | VRC | $\omega_k$ |
|---|---|---|
| 2 | 2527.73 | – |
| 3 | 1172.39 | 1566.48 |
| 4 | 1383.52 | -134.10 |
| 5 | 1460.56 | -124.66 |

Based on the four-cluster solution, which emerged from the hierarchical clustering, cluster centroids were aggregated and used as an input for the k-means clustering. Finally, the goodness of fit of the four-cluster solution was assessed using a two-step cluster analysis to provide further evidence of stability. Results revealed that a four-cluster solution to be optimal. The silhouette coefficient, which indicates the overall goodness of fit of the four clustering solution, indicated good cluster quality (0.5) (see Appendix Five for a screen shot of the silhouette coefficient from the output file). Figure 4.6 shows the mean scores of fear of failure and academic motivation for the four clusters identified.

MANOVA revealed a statistically significant multivariate effect of cluster membership $[F(3, 846) = 119.73, p < 0.001, \lambda = 0.13]$ and univariate follow-up analyses showed significant differences between all four clusters for fear of failure $[F(3, 846) = 1340.59, p < 0.001, \eta_p^2 = 0.83]$ and academic motivation $[F(3, 846) = 79.41, p < 0.001, \eta_p^2 = 0.22]$. Cross validation using discriminant function analysis confirmed that fear of failure and academic motivation predicted cluster membership in 97.3% of the cases.

### 4.9.1 Clusters and Association with Student Engagement

This section of the results reports the particular profiles of students within each of the four clusters in relation to their fear of failure, academic motivation and engagement. MANOVA tests were conducted to examine whether cluster membership was associated with student engagement and results are reported in Table 4.22. Figure 4.7 shows the mean scores for skills engagement, emotional engagement, participation engagement and performance engagement for the four clusters identified.

**The Low Fear of Failure and Moderate Academic Motivation Cluster**

Students in the first cluster ($n = 178, 20.94\%$) displayed low fear of failure ($M = 1.58$, $SD = 0.50$) combined with moderate academic motivation ($M = 5.18$, $SD = 1.22$). Their skills engagement ($M = 3.04$) and emotional engagement ($M = 3.51$) were below the sample mean; however, they reported high participation engagement ($M = 3.84$) and high performance engagement ($M = 4.01$). These results suggest that students with low fear of failure demonstrate high participation and performance engagement despite having lower skills and lower emotional engagement.

**The High Fear of Failure and Low Academic Motivation Cluster**

Students in the second cluster ($n = 274, 32.24\%$) displayed high fear of failure ($M = 3.96, SD = 0.72$) combined with low academic motivation ($M = 3.47, SD = 0.97$). Their skills engagement ($M = 2.87$), emotional engagement ($M = 3.58$), participation engagement ($M = 3.16$) and performance engagement ($M = 3.30$) were all below the sample mean. Results suggests that when students had high fear of failure they demonstrated lack of overall engagement (skills, emotional, participation

and performance). In other words, high fear of failure among students is found to be associated with overall disengagement.

**The Low Fear of Failure and High Academic Motivation Cluster**

Students in the third cluster ($n = 212, 24.94\%$) displayed low fear of failure ($M = 2.99, SD = 0.50$) combined with high academic motivation ($M = 6.13, SD = 0.87$). These students had high skills engagement ($M = 3.44$), high emotional engagement ($M = 4.02$), high participation engagement ($M = 3.95$) and high performance engagement ($M = 3.86$). They also reported the highest mean score of intrinsic motivation ($M = 5.18$). These results suggest that low fear of failure is accompanied with high intrinsic motivation and high overall engagement (skills, emotional, participation and performance).

**The High Fear of Failure and High Academic Motivation Cluster**

Students in the fourth cluster ($n = 186, 21.88\%$) displayed high fear of failure ($M = 5.00, SD = 0.00$) combined with high academic motivation ($M = 5.73, SD = 0.85$). These students had high skills engagement ($M = 3.58$), high emotional engagement ($M = 4.16$), but low participation engagement ($M = 3.53$) and low performance engagement ($M = 3.49$). Students within this cluster displayed the highest mean score of extrinsic motivation ($M = 6.64$). These results suggest that high fear of failure is accompanied by high extrinsic motivation, but low participation and performance engagement.

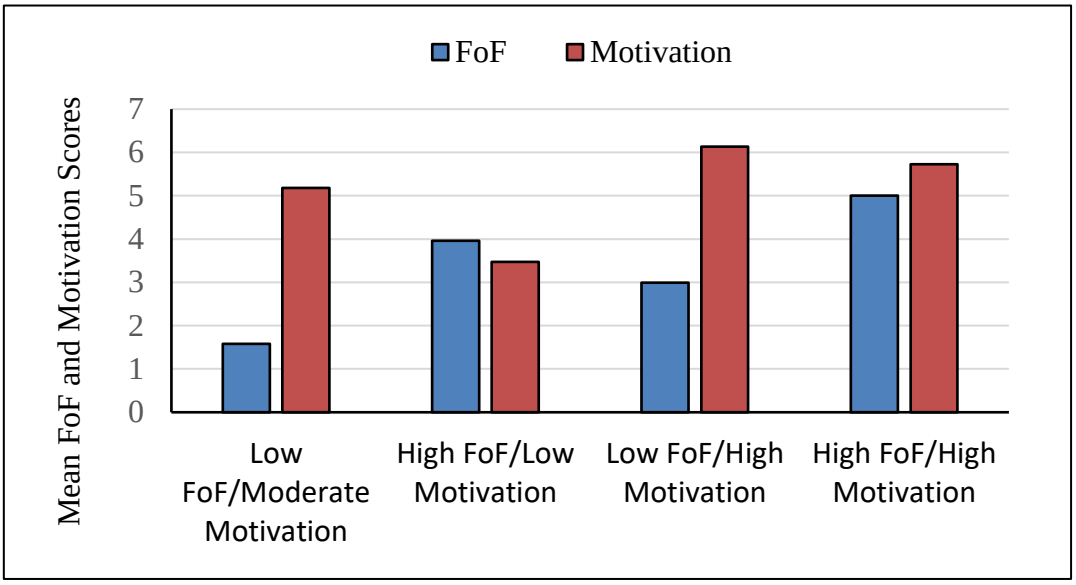


Figure 4.6 – Mean scores of fear of failure and motivation for the four clusters identified.

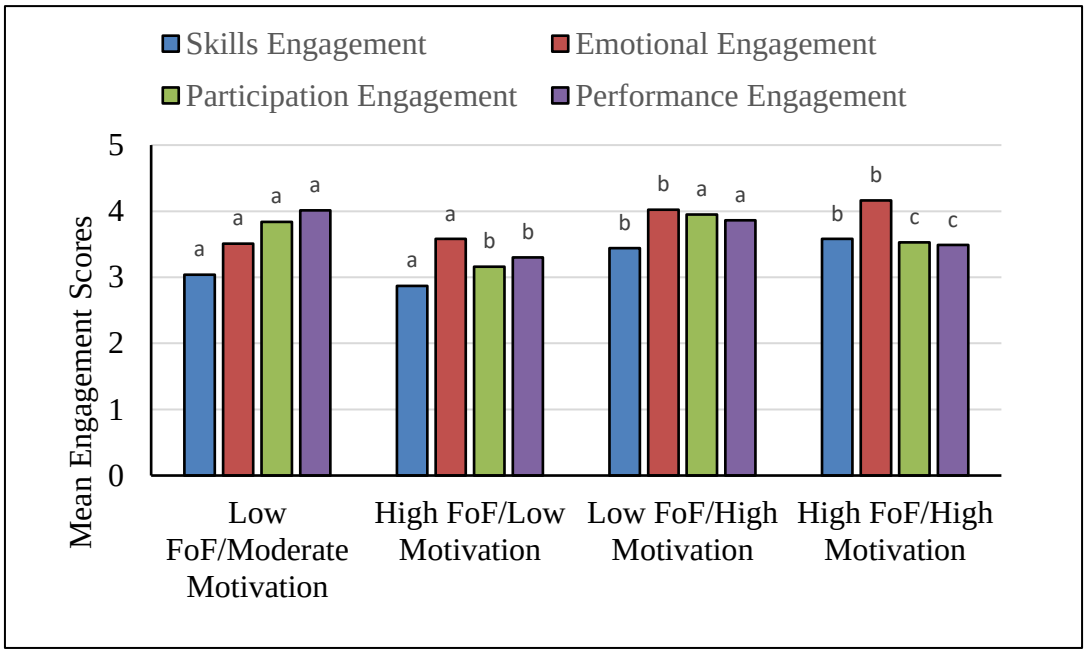


Figure 4.7 – Mean scores for skills engagement, emotional engagement, participation engagement and performance engagement for the four clusters identified.

Table 4.22 – Student engagement as a function of cluster group

| Cluster Groups | | Skills Engagement | | Emotional Engagement | | Participation Engagement | | Performance Engagement | |
|---|---|---|---|---|---|---|---|---|---|
| | | $F(3,846) = 21.24,$ $p < .001,\ \eta_p^2 = .07$ | | $F(3,846) = 21.52,$ $p < .001,\ \eta_p^2 = .07$ | | $F(3,846) = 21.77,$ $p < .001,\ \eta_p^2 = .07$ | | $F(3,846) = 35.95,$ $p < .001,\ \eta_p^2 = .11$ | |
| | *n* | *M* | *SD* | *M* | *SD* | *M* | *SD* | *M* | *SD* |
| Low FoF/Moderate Motivation | 178 | 3.04[a] | 1.16 | 3.51[a] | 1.12 | 3.84[a] | 1.16 | 4.01[a] | 0.68 |
| High FoF/Low Motivation | 274 | 2.87[a] | 0.97 | 3.58[a] | 1.02 | 3.16[b] | 1.13 | 3.30[b] | 0.81 |
| Low FoF/ High Motivation | 212 | 3.44[b] | 1.01 | 4.02[b] | 0.89 | 3.95[a] | 0.99 | 3.86[a] | 0.74 |
| High FoF/ High Motivation | 186 | 3.58[b] | 1.17 | 4.16[b] | 0.92 | 3.53[c] | 1.41 | 3.49[c] | 0.96 |

Note. Means in the same column with different superscripts were significantly different (p <.05).

### 4.9.2 Validation of the Cluster Solution

Breckenridge's (2000) double-split-cross-validation procedure was conducted to assess the internal validity of the cluster solutions. Results revealed that the clusters had excellent internal validity (average kappa = 0.96) (see Appendix Six for the output files). Furthermore, post hoc power analyses using G*Power software (Faul, Erdfelder, Buchner, & Lang, 2009) revealed excellent power with values being above 0.98. All post hoc power analyses were conducted for a calculated effect size from sample statistics and an $\alpha = 0.05$.

### 4.9.3 Summary of Findings of Cluster Analysis

This section summarises the findings of the cluster analysis, which were used to answer the third research question, that is, if latent homogenous clusters of students with particular profiles of fear of failure and academic motivation exist and if these clusters were differentially associated with the four dimensions of student engagement (skills, emotional, participation and performance). Results of hierarchical clustering suggested a range of possible solutions including: three-cluster; four-cluster; or five-cluster solutions; however, further computations of VRC and $\omega_k$ as recommended by Calinski and Harabasz (1974) confirmed the four-cluster solution to be optimal.

Participants in the first cluster had low fear of failure but moderate academic motivation. They demonstrated low skills and emotional engagement but high participation and high performance engagement. Participants in the second cluster demonstrated high fear of failure but low academic motivation and low overall engagement. In the third cluster, participants had low fear of failure but high academic motivation and high overall engagement. These students were intrinsically motivated.

In the fourth cluster, participants showed high fear of failure and high academic motivation. They demonstrated high skills and emotional engagement but low participation and low performance engagement. These students were extrinsically motivated.

Results confirmed that high fear of failure was associated with high extrinsic motivation, and low participation and low performance engagement. Overall, engagement was achieved when students were intrinsically motivated and not afraid of failing. Also, high motivation was associated with high skills and high emotional engagement.

### 4.10 Mediation and Moderation Analyses

This section of the analysis explored the fourth research question, that is, examining the modulatory role of extrinsic motivation, as a differentiated construct, in the relationship between fear of failure and engagement. This included investigating whether, and if so, which of the extrinsic motivation regulations (external regulation, introjected regulation and identified regulation) play a mediating and/or moderating role in the relationship between fear of failure, and student engagement.

#### 4.10.1 Mediation

This section of the analysis explored if external regulation, introjected regulation and identified regulation played a mediating role in the relationship between fear of failure and engagement. Similar to the cluster analysis, the mean scores of the items that strongly loaded onto their factors in the factor analyses for the constructs under investigation (fear of failure, external regulation, identified regulation, introjected

regulation, participation engagement, emotional engagement, skills engagement and performance engagement) were used in this section of the analysis. All mediation analyses were conducted in SPSS software (version 25.0) (IBM Corp., 2019), using the PROCESS plug in (version 2.16).

**The Mediating Role of Identified Regulation**

Results showed that fear of failure predicted skills engagement ($F(1,848) = 5.28, p < .05, R^2 = .01; b = .07, t(848) = 2.30, p < .05$), and identified regulation ($F(1,848) = 20.05, p < .001, R^2 = .02; b = .13, t(848) = 4.48, p < .001$). When the three variables were included together, identified regulation predicted skills engagement ($b = .18, t(847) = 4.95, p < .001$); however, the effect of fear of failure on skills engagement became insignificant ($b = .05, t(847) = 1.55, p > .05$). The relationship between fear of failure and skills engagement significantly decreased in strength with the presence of identified regulation (the mediator) and the overall model was statistically significant ($F(2,847) = 14.98, p < .001, R^2 = .03$). The Sobel test indicated a significant mediating effect of identified regulation ($Z = 3.28, p < .01$) suggesting that identified regulation fully mediated the relationship between fear of failure and skills engagement.

Fear of failure was also found to predict emotional engagement ($F(1,848) = 27.52, p < .001, R^2 = .03; b = .14, t(848) = 5.25, p < .001$); and identified regulation ($F(1,848) = 20.05, p < .001, R^2 = .02; b = .13, t(848) = 4.48, p < .001$). When the three variables were included together, identified regulation predicted emotional engagement ($b = .21, t(847) = 6.62, p < .001$); and fear of

failure also predicted emotional engagement ($b = .12, t(847) = 4.31, p < .001$). The relationship between fear of failure and emotional engagement decreased in strength with the presence of introjected regulation (the mediator) but remained significant ($F(2, 847) = 36.35, p < .001, R^2 = .08$). The Sobel test indicated a significant mediating effect of identified regulation ($Z = 3.68$ , $p < .001$) suggesting that identified regulation partially mediated the relationship between fear of failure and emotional engagement. Table 4.23 shows the mediation effects of identified regulation on skills and emotional engagement.

In summary, results suggest that identified regulation played a mediating role in the relationship between fear of failure and both skills and emotional engagement. Identified regulation fully mediated the relationship between fear of failure and skills engagement; however, it partially mediated the relationship between fear of failure and emotional engagement.

**The Mediating Role of Introjected Regulation**

Results showed that fear of failure predicted skills engagement ($F(1, 848) = 5.28, p < .05, R^2 = .01; b = .07, t(848) = 2.30, p < .05$) and introjected regulation ($F(1, 848) = 31.34, p < .001, R^2 = .04; b = .25, t(848) = 5.60, p < .001$). When the three variables were included together, introjected regulation predicted skills engagement ($b = .13, t(847) = 5.29, p < .001$), but the effect of fear of failure on skills engagement became insignificant ($b = .04, t(847) = 1.18, p > .05$). The relationship between fear of failure and skills engagement significantly decreased in strength with the presence of introjected regulation (the mediator) and the overall model

was statistically significant ($F(2, 847) = 20.25, p < .001, R^2 = .05$). The Sobel test indicated a significant mediating effect of introjected regulation ($Z = 4.04, p < .001$) suggesting that introjected regulation fully mediated the relationship between fear of failure and skills engagement.

Fear of failure was also found to predict emotional engagement ($F(1, 848) = 27.52, p < .001, R^2 = .03; b = .14, t(848) = 5.25, p < .001$); and introjected regulation ($F(1, 848) = 31.34, p < .001, R^2 = .04; b = .25, t(848) = 5.60, p < .001$). When the three variables were included together, introjected regulation predicted emotional engagement ($b = .13, t(847) = 6.30, p < .001$); and fear of failure also predicted emotional engagement ($b = .11, t(847) = 4.08, p < .001$). The relationship between fear of failure and emotional engagement decreased in strength with the presence of introjected regulation (the mediator) but remained statistically significant ($F(2, 847) = 34.21, p < .001, R^2 = .07$). The Sobel test indicated a significant mediating effect of introjected regulation ($Z = 4.15, p < .001$) suggesting that introjected regulation partially mediated the relationship between fear of failure and emotional engagement. Table 4.23 shows the mediation effects of introjected regulation on skills and emotional engagement.

In summary, results suggest that introjected regulation played a mediating role in the relationship between fear of failure and both skills and emotional engagement. Introjected regulation fully mediated the relationship between fear of failure and skills engagement; however, it partially mediated the relationship between fear of failure and emotional engagement.

Table 4.23– Mediation effects of external, introjected and identified regulation on skills and emotional engagement

| Mediator | Outcome variable | P | Model | *b* | *t* |
|---|---|---|---|---|---|
| External Regulation | Skills | c | $F(1,848) = 5.28, p < .05, R^2 = .01$ | .07 | 2.30* |
| | | a | $F(1,848) = 19.66,\ p < .001, R^2 = .02$ | .16 | 4.43*** |
| | | b | $F(2,847) = 3.00, p > .05, R^2 = .01$ | .02 | .85 |
| | | c’ | | .06 | 2.14* |
| | Sobel Test | $Z = .81\ , p > .05$ | | | |
| External Regulation | Emotional | c | $F(1,848) = 27.52, p < .001, R^2 = .03$ | .14 | 5.25*** |
| | | a | $F(1,848) = 19.66,\ p < .001, R^2 = .02$ | .16 | 4.43*** |
| | | b | $F(2,847) = 15.22, p < .001, R^2 = .03$ | .04 | 1.69 |
| | | c’ | | .13 | 4.94*** |
| | Sobel Test | $Z = 1.55\ , p > .05$ | | | |
| Introjected Regulation | Skills | c | $F(1,848) = 5.28, p < .05, R^2 = .01$ | .07 | 2.30* |
| | | a | $F(1,848) = 31.34,\ p < .001, R^2 = .04$ | .25 | 5.60*** |
| | | b | $F(2,847) = 20.25, p < .001, R^2 = .05$ | .13 | 5.92*** |
| | | c’ | | .04 | 1.18 |
| | Sobel Test | $Z = 4.04\ , p < .001$ | | | |
| Introjected Regulation | Emotional | c | $F(1,848) = 27.52, p < .001, R^2 = .03$ | .14 | 5.25*** |
| | | a | $F(1,848) = 31.34,\ p < .001, R^2 = .04$ | .25 | 5.60*** |
| | | b | $F(2,847) = 34.21, p < .001, R^2 = .07$ | .13 | 6.30*** |
| | | c’ | | .11 | 4.08*** |
| | Sobel Test | $Z = 4.15\ , p < .001$ | | | |
| Identified Regulation | Skills | c | $F(1,848) = 5.28, p < .05, R^2 = .01$ | .07 | 2.30* |
| | | a | $F(1,848) = 20.05,\ p < .001, R^2 = .02$ | .13 | 4.48*** |
| | | b | $F(2,847) = 14.98, p < .001, R^2 = .03$ | .18 | 4.95*** |
| | | c’ | | .05 | 1.55 |
| | Sobel Test | $Z = 3.28\ , p < .01$ | | | |
| Identified Regulation | Emotional | c | $F(1,848) = 27.52, p < .001, R^2 = .03$ | .14 | 5.25*** |
| | | a | $F(1,848) = 20.05,\ p < .001, R^2 = .02$ | .13 | 4.48*** |
| | | b | $F(2,847) = 36.35, p < .001, R^2 = .08$ | .21 | 6.62*** |
| | | c’ | | .12 | 4.31*** |
| | Sobel Test | $Z = 3.68\ , p < .001$ | | | |

Note. *p<.05, **p<.01, ***p<.001
Path a represents X predicting M, path b represents M predicting Y, path c’ represents X predicting Y after introducing M, and path c represents X predicting Y.

**The Mediating Role of External Regulation**

The mediating effect of external regulation on skills engagement ($Z = .81, p > .05$) and emotional engagement ($Z = 1.55, p > .05$) was not statistically significant. This means that externally imposed rewards do not mediate the relationship between fear of failure and either skills engagement or emotional engagement. Table 4.23 shows the mediation effects of external regulation on skills and emotional engagement.

Post hoc power analyses using G*Power software (Faul, Erdfelder, Buchner, & Lang, 2009) for all the significant tests above revealed adequate power ranging from 0.74 to 0.99. All post hoc power analyses were conducted for a calculated effect size from sample statistics and an $\alpha = 0.05$.

### 4.10.2 Moderation

This section of the analysis also explored the fourth research question, that is, examining the modulatory role of extrinsic motivation as a differentiated construct in predicting engagement. This included examining if external regulation, introjected regulation and identified regulation played a moderating role in the relationship between fear of failure, and engagement. As highlighted in chapter 3, McClelland and Judd (1993) warned researchers of the frequent difficulty encountered in finding statistically significant interactions and advised to control the number of predictor variables. Similar to both the cluster and mediation analyses, the mean scores of the items that strongly loaded onto their factors in the factor analyses for the constructs under investigation (fear of failure, external regulation, identified regulation, introjected regulation, participation engagement, emotional engagement, skills engagement and performance engagement) were used in this section of the analysis. All moderation analyses were conducted in

SPSS software (version 25.0) (IBM Corp., 2019), using the PROCESS plug in (version 2.16).

Results from moderation analyses indicated that fear of failure and introjected regulation independently accounted for a significant amount of variance in the overall model for participation engagement ($F(3, 846) = 23.09, p < .001, R^2 = .08$). Fear of failure predicted negative participation engagement ($b = -.18, t(846) = -5.45, p < .001$), and introjected regulation predicted positive participation engagement ($b = .18, t(846) = 6.86, p < .001$). The predicted interaction between the variables was statistically significant ($b = .06, t(846) = 2.92, p < .01$). To interpret the interaction effect (see Figure 4.8), the predicted values were computed for participation engagement and graphed at 1 *SD* above and below the mean for fear of failure and introjected regulation (see Aiken, West, & Reno, 1991).

Analyses of simple slopes for participation engagement with standardised variables indicated that when students held low fear of failure (1 *SD* below the mean) there was a significant positive relationship between introjected regulation and participation engagement ($b = .10, t(846) = 2.74, p < .01$). This relationship remained significant for students who held high fear of failure (1 *SD* above the mean) ($b = .26, t(846) = 6.29, p < .001$).

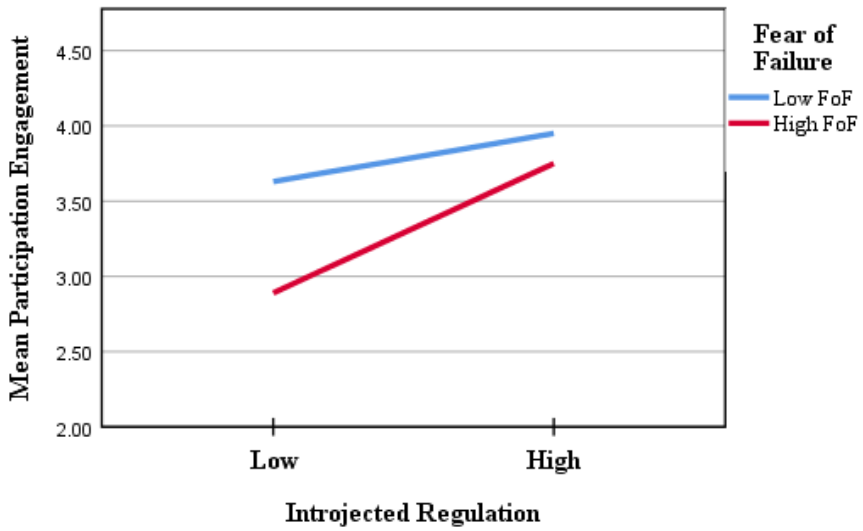


Figure 4.8 – Interaction between fear of failure and introjected regulation on participation engagement. Values are based on standardised coefficients and represent 1 *SD* below and above the mean.

The resulting graph indicated that introjected regulation appeared to moderate the negative association between fear of failure and participation engagement. At high introjected regulation, students with low fear of failure showed more participation engagement than those with high fear of failure, while at low introjected regulation, students with low fear of failure participated more than those with high fear of failure. Participation engagement was the highest among students who held low fear of failure and high introjected regulation. Introjected regulation also increased the participation engagement of students with high fear of failure. At high introjected regulation, the participation engagement gap decreased between students with high and low fear of failure compared to those with low introjected regulation.

Results from moderation analyses for performance engagement indicated that fear of failure and introjected regulation independently accounted for a significant amount of

variance in the overall model for performance engagement ($F(3, 846) = 37.12, p < .001, R^2 = .11$). Fear of failure predicted negative performance engagement ($b = -.21, t(846) = -10.01, p < .001$), and introjected regulation predicted positive performance engagement ($b = .09, t(846) = 4.72, p < .001$). The predicted interactions between the variables were statistically significant ($b = .03, t(846) = 2.09, p < .05$).

To interpret the interaction effect (see Figure 4.9), the predicted values were computed for performance engagement and graphed at 1 *SD* above and below the mean for fear of failure and introjected regulation (see Aiken, West, & Reno, 1991). Analyses of simple slopes for performance engagement showed that when students held low fear of failure (1 *SD* below the mean) there was a significant positive relationship between introjected regulation and performance engagement ($b = .06, t(846) = 2.59, p < .01$). This relationship remained significant for students who held higher fear of failure (1 *SD* above the mean) ($b = .13, t(846) = 4.18, p < .001$).

The resulting graph indicated that introjected regulation appeared to moderate the negative association between fear of failure and performance engagement. At high introjected regulation, students with low fear of failure showed better performance engagement than those with high fear of failure. At low introjected regulation, students with low fear of failure performed better than those with high fear of failure. Performance engagement was the highest among students who held low fear of failure and high introjected regulation. Introjected regulation also increased the performance

of students with high fear of failure. The performance gap decreased between students with high and low fear of failure at high introjected regulation.

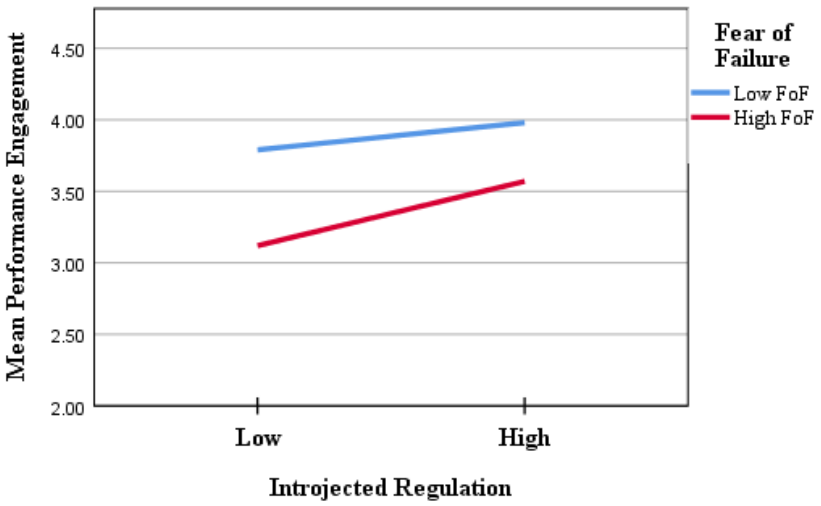


Figure 4.9 – Interaction between fear of failure and introjected regulation on performance engagement. Values are based on standardised coefficients and represent 1 *SD* below and above the mean.

Further analyses indicated that fear of failure and identified regulation independently accounted for a significant amount of variance in the overall model for performance engagement ($F(3, 846) = 40.20, p < .001, R^2 = .12$). Fear of failure predicted negative performance engagement ($b = -.21, t(846) = -10.03, p < .001$), and identified regulation predicted positive performance engagement ($b = .17, t(846) = 5.70, p < .001$). The predicted interactions between the variables were at the threshold of being significant for performance engagement ($b = .04, t(846) = 1.96, p = .05$). To interpret the interaction effect (see Figure 4.10), the predicted values were computed for performance engagement and graphed at 1 *SD* above and below the mean for fear of failure and introjected regulation (see Aiken, West, & Reno, 1991). All other tested interactions were not statistically significant.

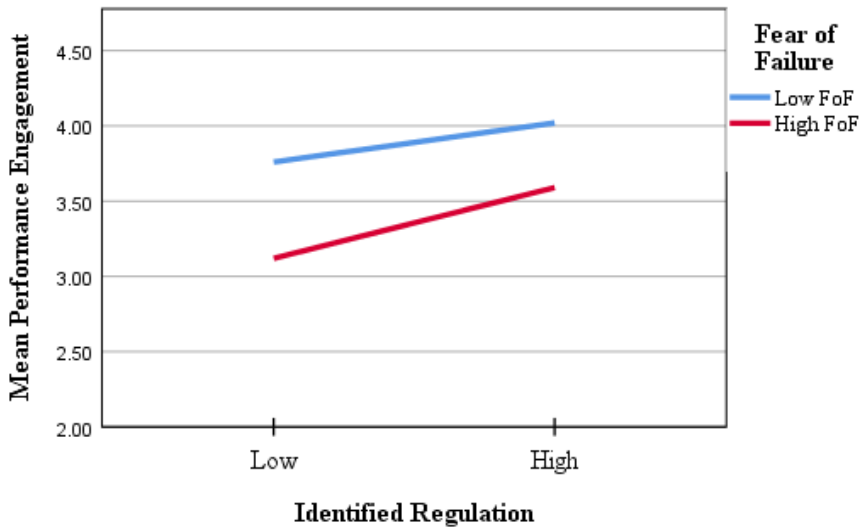


Figure 4.10 – Interaction between fear of failure and identified regulation on performance engagement. Values are based on standardised coefficients and represent 1 *SD* below and above the mean.

Post hoc power analysis using G*Power software (Faul, Erdfelder, Buchner, & Lang, 2009) for all the significant tests above revealed adequate power ranging from 0.74 to 0.99. All post hoc power analyses were conducted for a calculated effect size from sample statistics and an $\alpha = 0.05$.

### 4.10.3 Summary of Findings of Mediation and Moderation Analyses

Surprisingly, results of the SEM in section 4.7 showed no significant direct, or indirect effects via extrinsic motivation, from fear of failure to either skills engagement or emotional engagement. Therefore, it was essential to dig deeper into extrinsic motivation as a differentiated construct and examine if it plays a mediating role in the relationship between fear of failure and both skills and emotional engagement. Analyses were conducted to examine if identified regulation, introjected regulation and external regulation play a mediating role in the relationship between fear of failure and both skills and emotional engagement. Results showed that both identified and

introjected regulations fully mediated the relationship between fear of failure and skills engagement, but partially mediated the relationship between fear of failure and emotional engagement.

As discussed in chapter 2, identified regulation is a self-endorsed regulation where the person is willing to accept and change their behaviour, and introjected regulation is a self-inflicted behaviour in the form of feelings of guilt or shame. These self-endorsed and self-imposed regulations act to mediate and reduce the effect of fear of failure on skills engagement. This means that self-endorsed behaviours, in the form of valuing the behaviour, and self-imposed behaviours, in the form of ego, minimise the feelings of fear of failing and encourage greater skills engagement through concentration, and persistence. Moreover, these self-imposed and self-endorsed behaviours partially reduce the task-withdrawing emotions in the form of fear and encourage the presence of task-facilitating emotions such as interest and happiness in the form of emotional engagement.

Also, results in section 4.7 showed that fear of failure directly predicted negative participation engagement and negative performance engagement; however, results also showed that fear of failure indirectly predicted positive participation engagement via extrinsic motivation. Therefore, it was essential to examine which type of extrinsic motivation causes this positive indirect effect on participation engagement. Moderation analyses were conducted to test the interaction between fear of failure and extrinsic motivation (external, identified and introjected) on participation and performance engagement. Results revealed significant interactions between introjected regulation and fear of failure on participation and performance engagement.

High introjected regulation in the form of internalised rules and self-endorsed behaviours (e.g. ego involvements, and feelings of guilt or shame) appeared to decrease the engagement gap between students with high fear of failure and low fear of failure by improving their participation and performance engagement. Also, students with high fear of failure showed better participation and performance engagement levels when they had high self-endorsed behaviours (introjected regulation). Introjected regulation increased the participation and performance of students with high fear of failure.

External regulation, which involves control-determined behaviours that are initiated by controls in the environment (e.g. rewards, threats, inducements, expectations, prestige, financial advantage or deadlines), did not play either a mediating role or a moderating role in the relationship between fear of failure and engagement (skills, emotional, participation and performance).

### 4.11 Chapter Summary

This chapter presented the findings of the various statistical tests that were conducted to answer the research questions. The factor structure of the AMS, which is a previously established 7-factor instrument of 28 items, was examined and reduced to a 6-factor instrument of 22 items. Similarly, the factor structure of the SCEQ instrument, which is a previously established 4-factor instrument of 23 items, was examined. Results confirmed the previously established 4-factor model; however, the items were reduced to 14 to achieve adequate fit to the data.

Results from the SEM showed that fear of failure had direct positive influence on motivation and amotivation, and direct negative influence on participation and performance engagement. Also, extrinsic motivation predicted positive participation and performance engagement. As expected, amotivation predicted low overall engagement, while intrinsic motivation predicted high overall engagement. Indirect effects of fear of failure included: its positive effect on the skills, participation and emotional engagement of intrinsically motivated students; its positive effect on the participation engagement of extrinsically motivated; and its negative effect on the participation engagement of amotivated students.

Surprisingly, results from the SEM did not show any direct effects, or indirect effects via extrinsic motivation, from fear of failure to either skills engagement or emotional engagement. In the absence of these relationships, it was essential to examine extrinsic motivation as a differentiated construct. Mediation analyses were conducted to examine if identified, introjected and external regulations play a mediating role in the relationship between fear of failure and engagement. Results showed that self-endorsed and self-imposed regulations, in the form of identified and introjected regulations, act as mediators in the relationship between fear of failure and both skills and emotional engagement. This is a novel finding because, although the mediating role of extrinsic motivation has been explored in the existing literature, its mediating role in the relationship with fear of failure has not been reported.

Furthermore, results from the SEM also showed that fear of failure directly predicted negative participation and performance engagement, but indirectly predicted positive participation engagement through extrinsic motivation. In the presence of such

inconsistent relationships, it was necessary to investigate extrinsic motivation as a differentiated construct in order to identify which type of motivation was causing these relationships. Moderation analyses were conducted to examine if identified, introjected and external regulations played a moderating role in the relationship between fear of failure and engagement (participation and performance). Results revealed significant interactions between introjected regulation and fear of failure on both participation and performance engagement. This is a novel finding, since the moderating role of extrinsic motivation in predicting engagement has not been reported in the literature.

Not surprisingly, external regulation, which involves control-determined behaviours that are initiated by controls in the environment, did not play either a mediating role or a moderating role in the relationship between fear of failure and engagement (skills, emotional, participation and performance).

Results from the cluster analysis showed the existence of four distinct clusters based on their fear of failure and motivation. Participants in the first cluster had low fear of failure, and moderate academic motivation, but high participation and performance engagement. In the second cluster, participants demonstrated high fear of failure, low academic motivation and low overall engagement. Participants in the third cluster had low fear of failure, high academic motivation and high overall engagement. Students in the third cluster were characterised by their high intrinsic motivation. In the fourth cluster, participants showed high fear of failure, and high academic motivation, as well as high skills and emotional engagement. Students in the fourth cluster were characterised by their high extrinsic motivation. These results confirmed that extrinsically motivated students had high fear of failure while intrinsically motivated

students had low fear of failure. Overall, engagement was achieved when students were intrinsically motivated and not afraid of failing. Also, high motivation was associated with high skills and high emotional engagement, while low fear of failure was associated with high participation and high performance engagement.

The next chapter provides a discussion of these results in the light of the findings of other researchers, and highlights the contribution of this study to both existing literature and practice. A new model is constructed as a result of reviewing existing literature in the light of Self Determination Theory. Recommendations for future research and the limitations of this study are also discussed in the next chapter.

# Chapter 5 Discussion and Conclusion

## 5.1 Chapter Overview

This chapter discusses the main findings and implications of this study. First, a summary of the research objectives is presented. Next, study findings are highlighted and discussed in relation to existing literature. A new model based on my findings from reviewing existing literature, in light of Self Determination Theory, is introduced. The model presents a new approach to understanding motivation diversity, and extends the self-determination continuum to acknowledge the existence of different learners and the role of fear of failure within the composite learning environment. Implications for both theory and practice are highlighted, followed by a discussion of study limitations. Finally, directions and avenues for future research conclude this chapter.

## 5.2 Research Objectives

This study set out with the aim to address existing gaps in the literature by examining the relationship between fear of failure, academic motivation and engagement. Specifically, the aim was to examine fear of failure as one of the numerous antecedent variables that were identified by researchers to orient students' academic motivation and engagement in light of Self Determination Theory. In the absence of validated instruments to measure these constructs in United Kingdom higher education, and bearing in mind that existing research has tended to shy away from exploring negative emotions in education (Evans, Rich, Davies, & Allwood, 2005), this was a challenging task.

This study investigated the structural evidence of construct validity of AMS (Vallerand, et al., 1992) and SCEQ (Handelsman, Briggs, Sullivan, & Towler, 2005) instruments, which are two of the instruments used to measure academic motivation and engagement. It then examined the influence of fear of failure on academic motivation and engagement in light of Self Determination Theory. Furthermore, it investigated the existence of homogenous clusters of students with particular profiles of fear of failure and academic motivation and if these clusters were differentially associated with student engagement. Finally, this study examined extrinsic motivation as a differentiated construct and its modulatory role in the relationship between fear of failure and student engagement.

### 5.3 Summary of Findings

In this section the findings of this study are discussed in relation to each of the research questions.

#### 5.3.1 Structural Evidence of Construct Validity

This study contributes to the literature by exploring existing measurement tools of academic motivation and engagement in United Kingdom higher education. It validated and provided a modified version of the AMS instrument to measure academic motivation in higher education (see Appendix Three). It is essential to measure academic motivation using an instrument that has been validated among undergraduate students because academic motivation is privately experienced by students and is not visible to educators. This study also provided a modified version of the SCEQ instrument to monitor and measure student engagement in higher education (see

Appendix Four). This contribution is useful because engagement data was found to be a useful indicator for determining the quality of learning (Kuh, 2009a).

These contributions enable educators to use these instruments to monitor students' motivation and engagement that might lead to improvement of students' educational outcomes. Additionally, examining the validity of self-reported instruments, when used as part of data collection processes, informs the researcher of the degree to which an instrument truly measures what it claims to measure (Kline, 2005; Westen & Rosenthal, 2003).

**Structural Evidence of Construct Validity of the AMS**

On examining the factor structure of the AMS instrument results of fit indices indicated that the data fitted the 6-factor model and the 7-factor model best. Unlike Vallerand et al. (1992), the addition of 26 error covariance was unnecessary to achieve adequate fit of the 7-factor model. Results were found to be in agreement with other studies (see Fairchild, Horst, Finney, & Barron, 2005); however, further examination of the 7-factor model revealed that no items loaded on the seventh factor. Rather, the 6-factor model not only outperformed the 7-factor model, but also provided a better factor structure and adequate fit to the data, despite the cross loading of some items on more than one factor.

Admittedly, these results were unexpected since they contradicted other studies that partially supported the 7-factor model (Cokley, Bernard, Cunningham, & Motoike, 2001; Fairchild, Horst, Finney, & Barron, 2005). It is, however, worth mentioning that the similarities in the two studies that supported the 7-factor model could be attributable

to using a sample of university and college students from the United States. Like-for-like comparisons were hindered given that my study was the first one to use the AMS on a sample of undergraduate students in the United Kingdom.

Cokley, Bernard, Cunningham, and Motoike (2001) questioned the distinctiveness between the three types of intrinsic motivation given the high correlation reported between them. Results of my thesis reported significant correlation between the types of motivation; however, the correlation values were not high enough to suggest redundancy. According to authors of the AMS scale (Vallerand, et al., 1992), to support the simplex pattern of the scale, stronger correlations should be found between the adjacent types of motivation than between types that are farther apart on the motivation continuum. In addition, intrinsic motivation should be negatively correlated with amotivation as they are at opposite ends of the continuum. Although a few studies found some evidence to support the simplex pattern of the scale (Cokley, Bernard, Cunningham, & Motoike, 2001; Fairchild, Horst, Finney, & Barron, 2005), my study did not find significant evidence to support the simplex pattern. However, findings of my study supported the negative correlation between amotivation and intrinsic motivation to know.

To improve the construct validity and address the inconsistencies in the pattern of relations found among the subscales, some researchers proposed rewriting the AMS items. Other researchers questioned the scale's theoretical foundations in that extrinsic motivation may not be a mutually exclusive construct at opposite ends of a motivational continuum as Self Determination Theory suggests (Fairchild, Horst, Finney, & Barron, 2005). In this thesis, the decisions concerning retention and reduction of items were

based on theoretical justifications, where items that clearly loaded on a factor were retained while those with loadings below the suggested cut-off were removed (Ford, MacCallum, & Tait, 1986). This led to the reduction of 6 items and the retention of 22 items. The reduced scale showed good internal consistency, but slightly higher than the internal consistency reported by all three studies that used the English version of the AMS. No differences were reported when conducting a multi-group ESEM for gender, indicating that the scale could be used to collect data from both genders.

**Structural Evidence of Construct Validity of the SCEQ**

The SCEQ was developed and tested among a sample of undergraduate students from the United States (Handelsman, Briggs, Sullivan, & Towler, 2005). Although many other studies (Mandernach, 2009; Miller, Rycek, & Fritson, 2011; Witecki & Nonnecke, 2015) used the scale to measure engagement, only one study (Dixson, 2010) assessed its construct validity. Dixson (2010) used Handelsman et al.'s (2005) scale to measure online course engagement using a sample of students from the United States. Hence, like-for-like comparisons were hindered given that my study was the first one to use the SCEQ on a sample of undergraduate students in the United Kingdom. Dixson (2010) assessed the previously established 4-factor model of 23 items using Allen, Titsworth, and Hunt's (2009) recommendations. Dixson's results upheld the 4-factor structure; however, she reduced the items from 23 to 16. My thesis used the same predetermined criterion that was adopted by Dixson (2010). Results of my thesis also upheld the 4-factor structure; however, the items were reduced from 23 to 14 items.

Findings of my thesis reported significant correlation between the items of the scale, as would be expected; however, the correlation values were not high enough to suggest

redundancy. The reduced scale continued to produce moderate but significant correlations between the subscales. This finding agreed with Handelsman et al.'s (2005) findings, where they found moderate correlations between the variables apart from the correlation between emotional engagement and skills engagement. Similar to Handelsman et al.'s (2005) findings, the reliability coefficients of the subscales of the reduced scale were also above the recommended level. A multi-group ESEM for gender indicated that the differences were small across gender which means that the scale could be used to collect data from both genders.

### 5.3.2 The Influence of Fear of Failure on Motivation and Engagement

This thesis has contributed to the small body of existing literature on fear of failure in light of Self Determination Theory. Contributions offer insight into comprehending the positive and negative, direct and indirect effects of fear of failure on students' academic motivation and engagement. These contributions uncover how students' fear of failure impacts on the dynamics of the learning environment. These also address an identified gap in the existing literature regarding the direct and indirect influence of fear of failure on academic motivation and engagement.

In this thesis, fear of failure was found to directly predict greater extrinsic motivation and indirectly predict positive participation among extrinsically motivated students. Extrinsic motivation in the form of rewards acts as a motivator to minimise the negative effects of failure. This is a novel contribution that has not been explored before. Other researchers (Biggs, 1987; Entwistle & Ramsden, 1983; McCune & Entwistle, 2011) examined the link between extrinsic motivation, surface approach to studying and fear of failure. However, my thesis is the first known to me to establish the direct positive

influence of fear of failure on extrinsic motivation. Extrinsic rewards also act as '*safety signals*', which according to Gray (1987, p. 219) are signals that arise from the omission of an anticipated punishment, hence act to reduce fear and provide secondary reward for the avoidance response. Results of this thesis show that extrinsic motivation predicts greater participation engagement and performance engagement.

Fear of failure was found to have positive direct influence on intrinsic motivation and indirect positive influence on skills, participation and emotional engagement of intrinsically motivated students within this study. This finding supports and extends previous research (Entwistle, 1988) where students were reported to use their fear of failure as a source of continued effort to achieve success. It also supports the research (Conroy, Willow, & Metzler, 2002; Martin & Marsh, 2003) where fear of failure was found to be a friend to some students in the sense that it motivated successful performers to achieve a high level of performance.

Not surprisingly, intrinsic motivation was found to directly predict greater overall engagement among students in this study. According to Deci and Ryan (2008), intrinsic motivation stems from the innate psychological needs of competence and self-determination, hence intrinsically motivated students are expected to be fully engaged because they find the activity in itself rewarding (Whang & Hancock, 1994). Results of my study are in line with other research where intrinsic motivation is associated with authentic engagement (Newmann, 1992; Saeed & Zyngier, 2012; Schlechty, 2011). Results also confirm the research (Wigfield, Eccles, Schiefele, Roeser, & Davis-Kean, 2007; Wigfield & Wagner, 2007) that intrinsically motivated students are competent and engaged in their learning.

As expected, fear of failure is found to directly predict greater amotivation and indirectly predict negative participation engagement among amotivated students. These findings could be explained in light of other research (Entwistle, 1988; Entwistle & Ramsden, 1983; Entwistle, Thompson, & Wilson, 1974; Entwistle & Wilson, 1977) where fear of failure was found to be associated with general feelings of anxiety, inadequacy, low self-esteem, panic, lack of confidence and high level of neuroticism. It also confirms the research (Martin & Marsh, 2003) where fear of failure was found to be a foe to many students leading to high underachievement. High fear of failure was found to result in feelings of incompetence and expectancies of uncontrollability (Vallerand, et al., 1992) leading to the state of lacking the intention to act (Ryan & Deci, 2000), hence being amotivated. Amotivation was also found to predict negative skills, participation and performance engagement among students in my study, which extends the findings of other studies (Abramson, Seligman, & Teasdale, 1978; Deci & Ryan, 1985; Elliot, 1999; Ryan & Deci, 2000).

Results of this thesis confirm that fear of failure predicts lower participation engagement. This finding is in line with Rachman's (1998) explanations of the occurrence of avoidance behaviour. That is, engaging in fearful avoidance is determined mainly by the student's predicted expectations that their fear will be provoked when in contact with a particular situation. Hence, lack of participation is an avoidance behaviour that is provoked by the student's fear of being afraid to fail. Consistent with other research (Leitenberg, 2013; Rothblum, 1990; Schouwenburg, 1992), results of my thesis show that fear of failure predict lower performance engagement, since fear of failure was found to be an antecedent of procrastination

(Haghbin, McCaffrey, & Pychyl, 2012; Schouwenburg, 1992), resulting in poor performance and deficient study skills (Lerche, Neubauer, & Voss, 2018). Findings also supported and extended previous research (Covington, 1992; Huberts, Evers, & De Ridder, 2014; Martin & Marsh, 2003), suggesting that students with low fear of failure show more participation engagement and had better performance engagement than those with high fear of failure.

Unexpectedly, fear of failure did not directly predict either negative skills engagement or negative emotional engagement. These findings contradict Berger and Freund (2012) who confirmed that higher fear of failure at the beginning of the examination preparation period impaired affective well-being, and resulted in lower affective well-being at the end of examination preparation. It is worth mentioning that contradictions could be attributed to the fact that Berger and Freund (2012) measured fear of failure during the examination period and at three measurement points (these were: one month before examinations, four days before examinations and two weeks after examinations). They also contradict Heckhausen and Heckhausen (2018) who examined fear of failure from the students' self-evaluative perspective in achievement situations and found it to include feelings of incompetence, negative self-evaluation, and expectation of failure. The lack of support in other studies to this finding warrants the need for further investigations.

### 5.3.3 Learners' Profiles

This study extended the existing literature by using cluster analysis to gain an in-depth understanding of students' unique individual experiences and to depict particular profiles within the undergraduate student population. It identified distinct profiles of

students based on their fear of failure and academic motivation and examined the association of these profiles with student engagement. In this respect, it has made a number of contributions that extend other research (Entwistle, Thompson, & Wilson, 1974; Entwistle & Wilson, 1977; Ullrich-French & Cox, 2009) where distinctive clusters of students were identified. Four distinct clusters emerged from the results of this thesis reflecting four different types of learners within the learning environment who are driven by their high/low fear of failure and low/high academic motivation. Moreover, there were similarities and differences of engagement among the students within these four clusters.

Participants within two clusters (cluster 1 and cluster 3) reported low fear of failure, but average to high academic motivation respectively. Participants within both clusters also reported similar levels of high participation engagement and high performance engagement. This extends the research (Entwistle, 1988) where motivation was employed to explain the different levels of students' performance and is consistent with research that used cluster analysis to demonstrate the existence of groups of students with contrasting forms of motivation (Entwistle & Wilson, 1977). As would be expected, in this thesis, low fear of failure was found to be associated with high participation engagement and high performance engagement.

High academic motivation was reported by the participants within two clusters (cluster 3 and cluster 4). These students reported similar levels of high skills engagement and high emotional engagement regardless of their level of fear. This means that high motivation is associated with high skills and high emotional engagement regardless of the level of fear of failure within the participants, which contradicts the research (Berger

& Freund, 2012) where fear of failure was found to have negative affective consequences over time. Students in cluster 3 had similar characteristics to Entwistle and Wilson's (1977) cluster where students were highly motivated, had good organised study methods, achieved high grades and were emotionally stable. They also shared common characteristics with two of Ullrich-French and Cox's (2009) clusters: the self-determined cluster; and the motivated cluster.

Participants who reported low fear of failure, but high academic motivation (cluster 3), also reported the highest level of intrinsic motivation and full overall engagement (skills, emotional, participation and performance). These results confirm the research (Ullrich-French & Cox, 2009) where the students in the self-determined cluster and the motivated cluster reported moderate to high perceptions of competence, autonomy, relatedness and high levels of intrinsic motivation and identified regulation. Results also extend Biggs's (1976; 1987) work and confirm the research (Pantziara & Philippou, 2015) where high fear of failure was found to have negative effects on performance and learning in the mathematics classroom.

Participants who reported high fear of failure and high motivation (cluster 4), demonstrated the highest level of extrinsic motivation, which shows that fear of failure is associated with extrinsic motivation. This is a novel finding which was detected using cluster analysis. Previous research linked fear of failure to a surface approach (Entwistle & Ramsden, 1983; Tait & Entwistle, 1996), and identified fear of failure as a form of motivation (Entwistle, Thompson, & Wilson, 1974; Entwistle & Wilson, 1977). However, this thesis is the first known to me to establish the positive link between fear of failure and extrinsic motivation. Students in cluster 4 of this thesis had

similar characteristics to Entwistle and Wilson's (1977) cluster where students although achieving good degree results, were neurotic and motivated by their fear of failure.

Disengagement was reported among students who held both high fear of failure and low academic motivation (cluster 2). These results confirm the research (Entwistle & Wilson, 1977) that identified one cluster of students who had low motivation, poor achievements and poor study habits; and the research (Ullrich-French & Cox, 2009) that identified another cluster where students had the lowest perceptions of competence, autonomy, and relatedness. It also extended the research (Lerche, Neubauer, & Voss, 2018) where fear of failure was found to be associated with reduced learning rates during tasks, leading to disengagement.

Results of this study also extended the research (De Castella, Byrne, & Covington, 2013) where fear of failure was linked to students' disengagement at school; and tally with Putwain, Nakhla et al.'s (2016; 2017) and Nicholson, Putwain, Nakhla et al.'s (2018) findings linking students' appraisal of fear appeals to student engagement. However, these findings contradicted the research (Entwistle, 1988; Entwistle, Thompson, & Wilson, 1974) where fear of failure was found to drive attainment and success. The reasons behind these contradictions are not obvious; however, it is worth mentioning that Entwistle, Thompson, and Wilson (1974) used semi-structured interviews to collect data about students' pre-university experience, experience at university and post-university experience.

### 5.3.4 The Modulatory Role of Extrinsic Motivation

This study extends the literature by shedding light on the new modulatory role of extrinsic motivation, as a differentiated construct, in the relationship between fear of failure and engagement among undergraduate learners in the United Kingdom. Although academic motivation has been studied for a number of decades, the modulatory role of extrinsic motivation in the relationship between fear of failure and engagement has not been reported in the literature. This contribution is important because, on the one hand, extrinsic motivation is believed to inhibit the will to learn for its own sake (Vallerand, Deci, & Ryan, 1987), and fear of failure is found to be associated with: maladaptive self-protective behaviours (De Castella, Byrne, & Covington, 2013); shame (McGregor & Elliot, 2005); disorganisation (Berger & Freund, 2012); and academic procrastination (Schouwenburg, 1992). On the other hand, engagement plays an important role in measuring educational outcomes (Krause & Coates, 2008), and improves both learning (Coates, 2005) and retention (Kuh, 2009a).

This thesis is the first known to me to examine the modulatory role of extrinsic motivation as a differentiated construct in the relationship between fear of failure and engagement.

**The Mediating Role of Identified and Introjected Regulations**

When I examined the indirect influence of fear of failure on engagement via extrinsic motivation, results showed no significant influence from fear of failure on either skills or emotional engagement. Furthermore, I found no direct effects from fear of failure on either skills or emotional engagement. Admittedly, this was an unexpected result

bearing in mind the research (Berger & Freund, 2012; Schouwenburg, 1992) where fear of failure was found to be related to academic procrastination, disorganisation and negative affective well-being. It became apparent to me that extrinsic motivation should be examined as a differentiated construct in order to untangle these complex relationships. Hence, analyses were conducted to examine if identified, introjected and external regulations play a mediating role in the relationship between fear of failure and both skills and emotional engagement.

In this study, identified regulation was found to fully mediate the relationship between fear of failure and skills engagement. According to Self Determination Theory, identification is a self-endorsed regulatory process where the student feels a sense of choice or volition about behaving as they become willing to accept and change their behaviour for a desired outcome. Skills engagement refers to the strategies students employ to master their work and includes being actively involved through attendance, effort, persistence, and concentration (Fredricks, Blumenfeld, & Paris, 2004). Such strategies involve high levels of commitment and willingness to accept and endorse particular behaviours such as attending lectures. It is therefore not surprising for identified regulation to be found to minimise the strength of (i.e. fully mediate) the relationship between fear of failure and skills engagement. For example, a student who is afraid of failing as a result of not attending lectures believes that attendance is essential to be successful. The student's degree of identification (that is, their willingness to identify with the new behaviour of attending lectures), fully mediates the relationship between being afraid to fail and skills engagement.

Previous research showed that emotional engagement represents the student's affective interaction with the course material (Sciarra & Seirup, 2008) and includes the presence of task-facilitating emotions such as interest, happiness, and enjoyment as well as the absence of task-withdrawing emotions (Skinner & Belmont, 1993). In this study, the relationship between fear of failure and emotional engagement was found to be partially mediated by identified regulation. This is likely to be because identification, which involves self-endorsed behaviours, acts to reduce the task-withdrawing emotions in the form of fear and encourage the presence of task-facilitating emotions such as interest and happiness, that is emotional engagement. For example, a student who is afraid of failing and is also experiencing task-withdrawing emotions, is willing to be emotionally engaged with the course because the student believes that this is important to succeed. The student's identification with the required behaviour and their willingness to change their course of action reduces (i.e. partially mediates) the relationship between fear of failure and emotional engagement.

Another interesting finding of this study was that introjected regulation fully mediated the relationship between fear of failure and skills engagement and partially mediated the relationship between fear of failure and emotional engagement. This is likely to be because introjection involves internalised rules that pressure one to behave in order to avoid the consequences administered by the individuals to themselves (Deci & Ryan, 2000). These take the form of self-inflicted behaviours such as ego involvements or threats of guilt or shame in order to maintain self-worth in the eyes of others. Self-imposed behaviours to protect ego act to minimise the strength of the relationship between fear of failure and skills engagement and reduce the strength of the relationship between fear of failure and emotional engagement. A student, for example, who is not

attending lectures (i.e. not demonstrating skills engagement) is afraid of failing as a result. The student's self-imposed feelings of ego in order to maintain self-worth in the eyes of others (i.e. their introjected behaviour) pressure the student to attend lectures. Similarly, the student's introjected behaviour reduces (i.e. partially mediates) the relationship between fear of failure and emotional engagement by reducing the task-withdrawing emotions the student is experiencing.

As was expected, external regulation in the form of control-determined behaviours that are initiated by controls in the environment such as rewards, praise, grades, scholarships and written feedback, did not play a mediating role in the relationship between fear of failure and engagement. This extends the research (De Charms, 2013; Deci & Ryan, 1985; Heider, 1958) where external factors were found to diminish feelings of autonomy and where students were found to show poor maintenance to their motivation on the withdrawal of external factors.

In summary, findings of this study offer evidence that self-endorsed behaviours in the form of valuing the behaviour (i.e. identified regulation), and self-imposed behaviours in the form of ego (i.e. introjected regulation), minimise the feelings of fear of failing and encourage greater skills engagement (in the form of concentration, persistence, etc.). These regulations also encourage the presence of task-facilitating emotions such as interest and happiness (i.e. emotional engagement). These findings extend the research (Appleton & Hill, 2012; Jeno & Diseth, 2014) where the motivation regulations were found to play a mediating role, and the research (Georgiadis, Biddle, & Chatzisarantis, 2001) where identified forms of regulation were found to strongly influence feelings of self-worth.

**The Moderating Role of Introjected Regulation**

When I examined the direct effects of fear of failure on engagement, results showed that fear of failure predicted negative participation and negative performance engagement. However, extrinsic motivation predicted positive participation and performance engagement; and fear of failure indirectly predicted positive participation engagement via extrinsic motivation. Admittedly, these results were surprising, therefore it was essential that I further examine extrinsic motivation, as a differentiated construct, in order to find out what was causing these relationships. Hence, analyses were conducted to examine if identified, introjected and external regulations moderate the relationship between fear of failure and both participation and performance engagement.

In this study, results revealed significant interaction between introjected regulation and fear of failure on both participation and performance engagement. Students with high self-imposed behaviours and low fear of failure showed better participation and performance engagement than students with high fear of failure. The performance and participation engagement gap decreased among students who held high introjected regulation. Introjected regulation appeared to moderate the relationship between fear of failure and both participation and performance engagement. Self-inflicted behaviours that are self-administered (such as ego or feelings of guilt or shame), appeared to increase the participation and performance of students with high fear of failure. Performance and participation engagement was the highest among students who held low fear of failure but high introjected regulation. These findings extend the research (Jeno & Diseth, 2014) where autonomous forms of motivation were found to be positively associated with perceived school performance.

Identified and external regulations did not play a moderating role in the relationship between fear of failure and either participation or performance engagement.

### 5.4 Constructing a Motivational Model

Reviewing existing literature (Biggs, 1976; 1987; Entwistle & Ramsden, 1983; Entwistle, Thompson, & Wilson, 1974; Fransson, 1977; Marton, Hounsell, & Entwistle, 1984) in light of Self Determination Theory resulted in constructing a new motivational model presented in Figure 5.1. The aim of this model is not to stereotype or categorise students, but to acknowledge their lived reality and present a new approach to understanding the motivation diversity that they bring into the complex learning environment.

Educators cannot always rely on intrinsic motivation to promote and maximise academic engagement; therefore, awareness of different learners and their chosen type of motivation is essential. The model does not claim to depict all relationships that influence engagement, but rather extends the self-determination continuum to acknowledge the existence of different learners and recognise the role of fear of failure among these learners within the learning environment. The model has different learners at its centre and fear of failure as the main vertical axis with high and low fear of failure at opposite ends of the axis. The motivation continuum and students' approach to studying surround the different learners.


Figure 5.1 – Motivational model that extends the self-determination continuum to acknowledge the different learners and the role of fear of failure within the learning environment.

This contribution offers a perspective modelling the complexity of the learning environment in light of the complex nature of human behaviour, which is essential to improve teaching and learning. Identified regulation and integrated regulation are considered autonomous types of extrinsic motivation and are close to intrinsic motivation on the motivational continuum. In chapter 2 (section 2.5, and also sections 2.4.2 and 2.4.3), I argued that both identified regulation and integrated regulation are mostly true of students with overstriving behaviours. Students who exhibit overstriving behaviours have tendencies to seek out controls either in the environment or inside themselves and to interpret these as controlling. Their excessive fear of failure and high

approach to success motivates them to seek avoiding failure by succeeding and hence they display self-endorsed behaviours (identified and integrated regulations).

External regulation involves engaging in a behaviour only to satisfy external pressures, while introjected regulation involves complying with self-imposed pressures to avoid feelings of guilt or shame (Reeve, 2012). In chapter 2 (section 2.5, and also sections 2.4.2 and 2.4.3), I argued that both external regulation and introjected regulation are mostly true of students with self-protecting behaviours. Self-protecting students display extrinsically motivated behaviours which are control-determined behaviours (such as relying on rewards, threats, or financial advantage) to seek to motivate themselves (Deci & Ryan, 1985; 2008). These students do not find the task they are working on motivating, hence their main focus is on the task itself and not on what the task is about. Extrinsically motivated behaviours are instrumental because these are performed to some separable consequence such as achieving a particular goal (Deci, Vallerand, Pelletier, & Ryan, 1991; Whang & Hancock, 1994).

Reviewing the literature, as argued in chapter 2 (section 2.5), highlighted that motivation was found to be an important factor in influencing the choice of students' approach to studying (Biggs, 1976; 1987; Entwistle & Ramsden, 1983; Entwistle, Thompson, & Wilson, 1974). Threats in the form of extrinsic motivation and fear of failure were found to be associated with surface approaches to studying (Fransson, 1977). When learning is initiated by external factors (such as fulfilling the demands raised by others or self-imposed pressures) students' motivation becomes instrumental and is associated with a surface approach to studying (Entwistle & Ramsden, 1983).

Therefore, students with overstriving and self-protecting behaviours tend to exhibit surface approaches to studying.

As argued in chapter 2 (section 2.5), students who exhibit optimistic behaviours are intrinsically motivated, self-determined, have a high degree of choice and regulation of their own behaviour and are less controlled by extrinsic rewards (Covington & Omelich, 1991; Martin, Marsh, & Debus, 2001a). These students adopt a deep approach to studying because their intentions are supported by a sophisticated conception of learning (Entwistle, 2009; Fransson, 1977). However, students who exhibit failure accepting behaviours tend to have motivational deficits, and poor functioning (Martin & Marsh, 2003) as they anticipate repeated failures, which they attribute to their lack of ability (Covington, 1992). Therefore they are expected to be amotivated as argued in chapter 2 (section 2.5).

## 5.5 Contributions of this Research

In this section the unique contributions of this study are discussed. The findings have several implications that inform both current theory and practice, within the institution where this research was conducted as well as other institutions.

### 5.5.1 Implications for Theory

The current study made six contributions to the literature in terms of fear of failure, academic motivation and engagement. The first contribution is to the small body of existing literature on fear of failure by providing the first known documentation that uncovers how students' fear of failing impacts on their academic motivation and engagement. This study has established direct and indirect effects of fear of failure on

academic motivation and engagement. These include: (1) the direct positive influence of fear of failure on motivation and amotivation; (2) the direct negative influence of fear of failure on participation and performance engagement; (3) the indirect positive influence of fear of failure on participation engagement of extrinsically motivated students; (4) the indirect positive influence of fear of failure on overall engagement of intrinsically motivated students; and (5) the indirect negative influence of fear of failure on participation engagement of amotivated students.

Despite the importance of fear of failure as a construct, surprisingly little research has been conducted to link it to other constructs in the field of education. In fact, research has tended to avoid exploring negative emotions in education (Evans, Rich, Davies, & Allwood, 2005) which makes this study the first known to investigate fear of failure among undergraduate students in the United Kingdom. This contribution adds a vital component because fear of failure was found to be counterproductive (Cox, 2009), related to anxiety, disorganisation and negatively predicted a change in affective wellbeing (Berger & Freund, 2012; Correia & Rosado, 2018). It was also found to be related to slow information accumulation, and reduced learning rates during tasks (Lerche, Neubauer, & Voss, 2018).

The second contribution is the positive link between fear of failure and extrinsic motivation. This is a novel finding and was detected using SEM and cluster analysis. Previous research linked fear of failure to a surface approach to studying (Entwistle & Ramsden, 1983; Tait & Entwistle, 1996), and identified fear of failure as a form of motivation (Entwistle, Thompson, & Wilson, 1974; Entwistle & Wilson, 1977). This

contribution adds to this picture, because it offers a better understanding of the unique individual's experiences and depicts particular profiles within the student population.

The third contribution arises from the positive results which indicate that identified and introjected regulations play a mediating role in the relationship between fear of failure and both skills and emotional engagement. The fourth contribution is the finding that there is a positive moderating role of introjected regulation in the relationship between fear of failure and both participation and performance engagement. Both of these contributions are novel additions to the literature. These extend the motivation literature by shedding light on the importance of using self-endorsed and self-imposed regulations to modulate the influence of fear of failure on student engagement. Self-regulation not only refers to managing one's own motivation towards learning but also the more cognitive aspects of thinking and reasoning (Higgins et al. 2014). Although the construct of academic motivation has been studied from several perspectives in the last two decades, the modulatory role of extrinsic motivation as a differentiated construct in the relationship between fear of failure and engagement has not been reported in the literature.

This is the first known study to examine the mediating and moderating roles of extrinsic motivation, as a differentiated construct, in conjunction with fear of failure and student engagement. These findings add to the literature highlighting that academic motivation is the force that initiates and directs behaviour (Petri, 1981), and the psychological process involved in the persistence of this behaviour (Bergin, Ford, & Hess, 1993; Franken, 1988). Furthermore, understanding how self-imposed and self-endorsed behaviours play a role in influencing fear of failure and student engagement adds to our

perspectives, furthering studies confirming that fear of failure forms an impending threat to academic motivation (Conroy, 2001), and has an inverse relationship with student engagement (Caraway, Tucker, Reinke, & Hall, 2003).

The fifth contribution is creating a new motivational model which is based on reviewing the existing literature in light of Self Determination Theory (see Figure 5.1). This is the first study known that applies Self Determination Theory in conjunction with existing literature to introduce and explain the motivation diversity that students bring to the complex learning environment. The new model extends the self-determination continuum to acknowledge the existence of different learners and recognises the role of fear of failure among these learners within the learning environment. This contribution raises awareness and understanding of the motivation of different types of learners, which is essential to fulfilling their needs for autonomy, competence and relatedness. Comprehending the complexity of the classroom environment in light of the complex nature of human behaviours is a factor that can support improvement of teaching and learning.

The sixth contribution is that, to my knowledge, this is the first study in the United Kingdom that contributes to the literature by providing further investigations to existing measurement tools in higher education. It validated and provided a modified version of the AMS instrument to measure academic motivation in higher education. Measuring academic motivation is important because academic motivation is privately experienced by students and is not visible to educators; however, its impacts on students' engagement is publicly visible. Therefore, in researching this topic and context, it is

essential to have an instrument that has been validated among students from the United Kingdom in order to measure academic motivation with any level of certainty.

Moreover, this study has validated and provided a modified version of the SCEQ instrument to monitor and measure students' engagement in higher education. This outcome is important to research in this field, because researchers have confirmed that engagement data are a useful indicator for determining the quality of learning (Kuh, 2009a; Trowler, 2010) and are used to target resource provision (Coates, 2007). It is necessary to have an instrument that has been validated among students from the United Kingdom in order to accurately measure student engagement.

Academic motivation and engagement have either been studied independently or together but their relationship with fear of failure, to my knowledge, has not been studied before. Furthermore, this is the first known study to examine student engagement as an outcome that arises out of being academically motivated. The contributions of this study offer better understanding of the construct of student engagement which is considered a positive predictor of learning and personal development and is positively linked with high-quality learning outcomes (Krause & Coates, 2008). Engagement is influenced by the extent of the individual's active participation in a range of educationally purposeful activities leading to high quality learning (Coates, 2005; Graham, Tripp, Seawright, & Joeckel, 2007). Engaged students take responsibility for their own learning and are usually self-regulated and self-determined. They tend to choose tasks that are complex and immerse themselves into learning whether inside or outside of the classroom. Indeed, Coates (2005) argued for the necessity of using it as a diagnostic tool of student learning and for quality assurance.

### 5.5.2 Implications for Practice

One of the underlying drivers behind this study was the desire to make it as practically relevant as possible, given the challenges that we as educators face on a daily basis in order to engage undergraduate students. This study provides an extension to existing research on the complex nature of classroom learning in United Kingdom higher education. Two insights have emerged.

The first insight is the significant impact of fear of failure on the dynamics of academic engagement within the learning environment. Minimising students' fear of failure can be argued from my findings to be vital to nurture academic motivation and engagement. For example, in science and mathematics classrooms, this may involve engaging students in real-life scenarios such as conducting experiments or mathematical outdoor investigations. Providing increased opportunities for success in the classroom environment will help reduce the effects of fear of failure and increase students' academic engagement. Higgins et al. (2014) confirmed that the poor motivation of low attainers is a logical response to repeated failures and that providing these students with increased opportunities of success will result in increasing their motivation and confidence.

Also, creating learning environments that are constantly demanding more, but still recognising students' self-worth by attributing student success to effort rather than ability and promoting resilience to failure (grit) (Higgins et al. 2014). Although grouping by ability, either by allocating students to different classes or to within-class groups, is widely used in many subjects; research has suggested that this makes very little difference to students' learning outcomes (Higgins et al. 2014).

The second insight is recognising the importance of prompting self-inflicted behaviours in the form of introjected regulation in order to moderate the relationship between fear of failure and both participation and performance engagement. This could be in the form of positive fear appeal messages that aim to be evaluated by students as challenging, not threatening, such as how to take a course of action to avoid failure (see Putwain, Nakhla et al. (2016; 2017) and Nicholson, Putwain, Nakhla et al. (2018)). Also, events that facilitate self-determined functioning, such as communicating competence are unlikely to undermine students' overall engagement. Other researchers have confirmed that fear of failure is associated with the appraisals of threats to the individual's ability (Conroy & Elliot, 2004; Covington, 1992; Lazarus, 1991; Martin & Marsh, 2003) and hence increases the drive to '*escape or avoid*' (Rachman, 1998, p. 26).

These contributions can support practitioners because sometimes educators unintentionally fail to cater for students' basic psychological needs (autonomy, competence and relatedness) by paying less attention to making their subject interesting, particularly at degree level. Researchers have confirmed that when students were intrigued by the relevance and content of what they were learning, they adopted a deep approach to studying (Fransson, 1977). Higgins et al. (2014) have highlighted that learners need to engage in activities which make them think harder and develop strategies to help themselves when they 'get stuck' based on the expectations in different subjects. Engaged learners are the ones who perceive their work as interesting and fun, practise increasing opportunities of success and immersing themselves into learning by adopting a deep approach to studying.

### 5.6 Limitations of this Study

Every study inherently has its limitations and this study is not exempt in that respect. Having a largely homogenous sample that was drawn from one higher education institution was one limitation. Although the sample was randomly selected from diverse courses within three different faculties, these were all drawn from one higher education institution in the North West; hence they were not representative of the population of undergraduate students in the entire United Kingdom. Moreover, although this study did not examine gender differences in relation to the research questions, there was unfortunately no information available to the researcher of how the gender split among the sample represented the gender split among the population of students within this higher education institution. This means that, in this study, sample representativeness is a limitation in relation to the external validity of the findings. Put differently, while the findings of this study offer unique and significant implications to both theory and practice, caution should be taken about assuming that these findings can be generalised beyond the sample of undergraduate students from this particular higher education institution in the North West.

Furthermore, although path analysis is a useful statistical tool to estimate the direct and indirect relationships between the variables, it has its own limitations. Path analysis is a confirmatory technique, it confirms if the model is consistent with the data; however, it does not necessarily mean that the confirmed model corresponds to reality (Bollen, 1989). Moreover, while a particular model is confirmed to be consistent with the data, that does not rule out other alternative models that might also be equally consistent with the same data. Therefore, caution is needed when inferring particular relationships among the variables. Furthermore, although the goodness of fit statistics is useful to

make global comparisons, it also acts as a limitation because it is impossible to state precisely what a particular value actually means in reality (Steiger, 2007).

Similarly, although cluster analysis is a powerful data-mining tool that identifies distinct groups within the population, it has its own limitations. These include the researcher's subjectivity in deciding the final solution and the sensitivity of the clustering algorithm used in the analysis (Calinski & Harabasz, 1974; Sarstedt & Mooi, 2014). In this study, to decide on the final solution, the method advocated by Calinski and Harabasz (1974) was used to compute VRC; however, one limitation was that the minimum number of clusters selected by this method had to be three. Furthermore, another limitation was using a hierarchical cluster procedure, which suffers from a non-uniqueness problem; hence it had to be repeated until a consistent solution emerged (Sarstedt & Mooi, 2014).

Finally, another potential limitation was using questionnaires as the method of collecting data. Feldman, Altrichter, Posch, and Somekh (2018) highlighted that there is no way of ensuring that participants understand the questions as intended by the authors and that the questions may not always be taken seriously by everyone, particularly if the topic is not important to the participants. They also highlighted that answers may be distorted by factors that the respondent is not at all, or only partially, aware of. Also, since the instruments measure constructs which are closely linked to self-image and self-esteem, this can lead to a subconscious tendency to paint a positive picture of oneself, or at least to avoid giving a negative impression. It is argued, however, that the anonymous and impersonal nature of the questionnaires made it easier for the respondents to be honest and reflective.

### 5.7 Recommendations for Future Research

Although the AMS scale was designed to hypothetically evaluate the Self Determination Theory as theorised by Deci and Ryan (1985; 2000), it does not assess the fourth type of extrinsic motivation, that is, integrated regulation. Hence, there is a call to develop a fourth subscale to the existing instrument and to test its validity with diverse samples. Similarly, there is a need to reassess the construct validity of the SCEQ instrument to feel confident in the scale's use as an effective assessment tool to measure student engagement and see if the factor structure suggested in this study is corroborated.

On investigating the influence of fear of failure on academic motivation and engagement, this study presented a structural equation model that explains these relationships (Figure 4.5). The diagram was based on Handelsman, Briggs, Sullivan, and Towler's (2005) conceptualisation of student engagement (skills engagement, emotional engagement, participation engagement and performance engagement). The view taken in this study was that engagement was the measure of students' intrinsic involvement in the learning and the '*observed effect*' of academic motivation (Reeve, 2012, p. 151). It is recommended to test if different conceptualisations of student engagement would produce similar relationships between the variables.

High fear of failure was found to be positively associated with extrinsic motivation. Previous research identified fear of failure as a contrasting form of motivation (Entwistle, Thompson, & Wilson, 1974; Entwistle & Wilson, 1977). Hence, there is a call to test the relationship between fear of failure and extrinsic motivation, particularly with more diverse samples to see if this finding is corroborated.

Finally, there is a recommendation for further investigations into the relationships established in the new model (see Figure 5.1). Particular attention should be paid to linking different learners to their perceptions of the academic environment and their approaches to studying using the Approaches and Study Skills Inventory for Students (Entwistle, 1997). This recommendation is vital to comprehending the complex nature of human behaviour, and to improving students' educational outcomes.

## 5.8 Conclusion

This study set out to address existing gaps in the literature by examining the relationship between fear of failure, academic motivation and student engagement. Results introduced fear of failure as an influential factor of motivation and engagement and identified distinct clusters of students based on their fear of failure and motivation. Results also revealed the positive modulatory role of extrinsic motivation, as a differentiated construct, in the relationship between fear of failure and engagement. A model that extended the self-determination continuum to acknowledge the different learners and the role of fear of failure was introduced. Examining fear of failure is essential to gaining insight into the complexity of the learning environment in light of the complex nature of human behaviours. I hope that this study will be the catalyst for other researchers to further examine fear of failure and inform practice in United Kingdom higher education institutions.

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**Appendix One**

**The instruments used.**

The Academic Motivation Scale.

**WHY DO YOU GO TO UNIVERSITY?**

1. Because with only a high-school degree I would not find a high-paying job later on.
2. Because I experience pleasure and satisfaction while learning new things.
3. Because I think that a university education will help me better prepare for the career I have chosen.
4. For the intense feelings I experience when I am communicating my own ideas to others.
5. Honestly, I don't know; I really feel that I am wasting my time at university.
6. For the pleasure I experience while surpassing myself in my studies.
7. To prove to myself that I am capable of completing my university degree.
8. In order to obtain a more prestigious job later on.
9. For the pleasure I experience when I discover new things never seen before.
10. Because eventually it will enable me to enter the job market in a field that I like.
11. For the pleasure that I experience when I read interesting authors.
12. I once had good reasons for going to university, however, now I wonder whether I should continue.
13. For the pleasure that I experience while I am surpassing myself in one of my personal accomplishments.
14. Because of the fact that when I succeed at university I feel important.
15. Because I want to have "the good life" later on.
16. For the pleasure that I experience in broadening my knowledge about subjects which appeal to me.
17. Because this will help me make a better choice regarding my career orientation.
18. For the pleasure that I experience when I feel completely absorbed by what certain authors have written.
19. I can't see why I go to university and frankly, I couldn't care less.
20. For the satisfaction I feel when I am in the process of accomplishing difficult academic activities.
21. To show myself that I am an intelligent person.
22. In order to have a better salary later on.
23. Because my studies allow me to continue to learn about many things that interest me.
24. Because I believe that a few additional years of education will improve my competence as a worker.
25. For the "high" feeling that I experience while reading about various interesting subjects.
26. I don't know; I can't understand what I am doing at university.
27. Because university allows me to experience a personal satisfaction in my quest for excellence in my studies.
28. Because I want to show myself that I can succeed in my studies.

The Fear of Failure Scale.

| **QUESTION** |
|---|
| 1. When I am failing, I worry about what others think about me.<br>2. When I am failing, I am afraid that I might not have enough talent.<br>3. When I am failing, it upsets my "plan" for the future.<br>4. When I am not succeeding, people are less interested in me.<br>5. When I am failing, important others are disappointed. |

The Student Course Engagement Questionnaire.

| **To what extent do the following behaviours, thoughts, and feelings describe you, in this course?** |
|---|
| 1. Making sure to study on a regular basis<br>2. Putting forth the effort<br>3. Doing all the assignments<br>4. Staying up on the readings<br>5. Looking over class notes between classes to make sure I understand the material<br>6. Being organized<br>7. Taking good notes in class<br>8. Listening carefully in class<br>9. Coming to class every day<br>10. Finding ways to make the course material relevant to my life<br>11. Applying course material to my life<br>12. Finding ways to make the course interesting to me<br>13. Thinking about the course between class meetings<br>14. Really desiring to learn the material<br>15. Raising my hand in class<br>16. Asking questions when I don't understand<br>17. Having fun in class<br>18. Participating actively in small-group discussions<br>19. Going to the tutor's office hours to review assignments or tests or to ask questions<br>20. Helping fellow students<br>21. Getting a good grade<br>22. Doing well on exams<br>23. Being confident that I can learn and do well in the class |

# Appendix Two

## Participants' consent form and information sheet.

**Consent Form**

**Title of Project:** Structural Equation Modelling: The Influence of Fear of Failure on Academic Motivation and Engagement

**Name of Researcher:** Nakhla

| | | Please Tick |
|---|---|---|
| 1. | I confirm that I have read and understood the information sheet dated 9th March 2016 for the above study. I have had the opportunity to consider the information, ask questions and have had these answered satisfactorily. | |
| 2. | I understand that my participation in this research study is voluntary. If for any reason I wish to withdraw during the period of this study, I am free to do so without providing any reason and should not suffer any negative consequences such as unfair discrimination, reduction in the level of care, or any other disadvantage either actual or perceived. I understand that my contributions will be part of the data collected for this study and my anonymity will be ensured. I give consent for all my contributions to be included in this study. | |
| 3. | I understand that I may withdraw within 2 weeks by e-mailing the researcher without prejudice and my data will be destroyed. | |
| 4. | I understand that the information I provide will be used for a PhD research project and the combined results of the project may be published. | |
| 5. | I agree to take part in the above study. | |

**Name of Participant:**

Signature

Date

## Participant Information Sheet

### *Title of Project:*

**Proposed Thesis Title:** Structural Equation Modelling: The Influence of Fear of Failure on Academic Motivation and Engagement

**Dear Student,**

I would like to invite you to take part in my PhD thesis research with the Department of Educational Research at Lancaster University. Before you decide if you wish to take part you need to understand why the research is being done and what it would involve for you. Please take time to read the following information carefully. Talk to others about the study if you wish. Ask me if there is anything that is not clear or if you would like more information. Take time to decide whether or not you wish to take part.

This document includes:

- Information about the purpose of the study (what I hope to find out).
- Information about what participation means and how to withdraw when and if you wish.
- Details of the information that may be used as 'data' in the study.
- Information about how this data will be secured and stored.
- How the information will be used in the thesis and for other purposes such as conference presentations or publication.

The purpose of the study

This research is for my PhD thesis in Educational Research in the Department of Educational Research at Lancaster University. My research aims to gain an understanding of the influence of fear of failure on students' motivation and engagement. There is a need to motivate and engage students in the work in order to improve their academic performance. The research aims to offer insights to teachers and lecturers involved in teacher education.

**Why have I been invited?**

You have been invited to participate because your views and opinions are very important and will help me gain an understanding of students' motivation and engagement.

**Do I have to take part?**

No, your participation is entirely voluntary. If you do not wish to take part, then please let me know. If you choose to decline or withdraw you should not suffer any negative consequences such as unfair discrimination, reduction in the level of care, or any other disadvantage either actual or perceived. You also have the right to withdraw without

prejudice within 2 weeks by e-mailing me and I will destroy your data based on your identification number.

**What would taking part involve for me?**

Your participation will involve about 20 - 25 minutes of your time to respond to three questionnaires.

**What will happen to the data?**

The word 'data' refers to the answers you will give to the three questionnaires and any email exchanges we may have had. The data will be securely stored for ten years after the successful completion of the PhD *Viva* as per Lancaster University requirements, and after that any data will be destroyed. Identifiable data on my personal laptop will be encrypted. Data may be used in the reporting of the research (in the thesis and then potentially in any papers or conference presentations). Please note that if your data is used, it will not identify you in any way or means. You have the right to request this data is destroyed at any time during the study as well as having full protection via the UK Data Protection Act. The completion of this study is estimated to be by summer of 2017 although data collection will be complete by August 2016. Data will only be accessed by members of the research team and support services, this includes my supervisor. The research may be used for journal articles and conference presentations.

**How will my identity be protected?**

Your identification number will be destroyed and any identifying information about you will be removed from the final report.

**Who do I contact for further information or with *any* concerns?**

This project has been reviewed and approved by members of Lancaster University Research Ethics Committee. In accordance with the Data Protection Act, the information collected for this research will be kept strictly confidential. Also, if you would like further information on this project, the programme within which the research is being conducted or have any concerns about the project, participation or my conduct as a researcher please contact:

Professor Paul Ashwin – Head of Department

Tel: +44 (0)1524 594443

Email: P.Ashwin@Lancaster.ac.uk

Room: County South, D32, Lancaster University, Lancaster, LA1 4YD, UK.

Thank you for reading this information sheet.

## Appendix Three

**A copy of the reduced AMS.**

**WHY DO YOU GO TO UNIVERSITY?**

1. Because with only a high-school degree I would not find a high-paying job later on.
2. Because I experience pleasure and satisfaction while learning new things.
3. Because I think that a university education will help me better prepare for the career I have chosen.
4. Honestly, I don't know; I really feel that I am wasting my time at university.
5. In order to obtain a more prestigious job later on.
6. For the pleasure I experience when I discover new things never seen before.
7. Because eventually it will enable me to enter the job market in a field that I like.
8. For the pleasure that I experience when I read interesting authors.
9. I once had good reasons for going to university, however, now I wonder whether I should continue.
10. Because of the fact that when I succeed at university I feel important.
11. Because I want to have "the good life" later on.
12. For the pleasure that I experience in broadening my knowledge about subjects which appeal to me.
13. Because this will help me make a better choice regarding my career orientation.
14. For the pleasure that I experience when I feel completely absorbed by what certain authors have written.
15. I can't see why I go to university and frankly, I couldn't care less.
16. To show myself that I am an intelligent person.
17. In order to have a better salary later on.
18. Because my studies allow me to continue to learn about many things that interest me.
19. Because I believe that a few additional years of education will improve my competence as a worker.
20. For the "high" feeling that I experience while reading about various interesting subjects.
21. I don't know; I can't understand what I am doing at university.
22. Because I want to show myself that I can succeed in my studies.

## Appendix Four

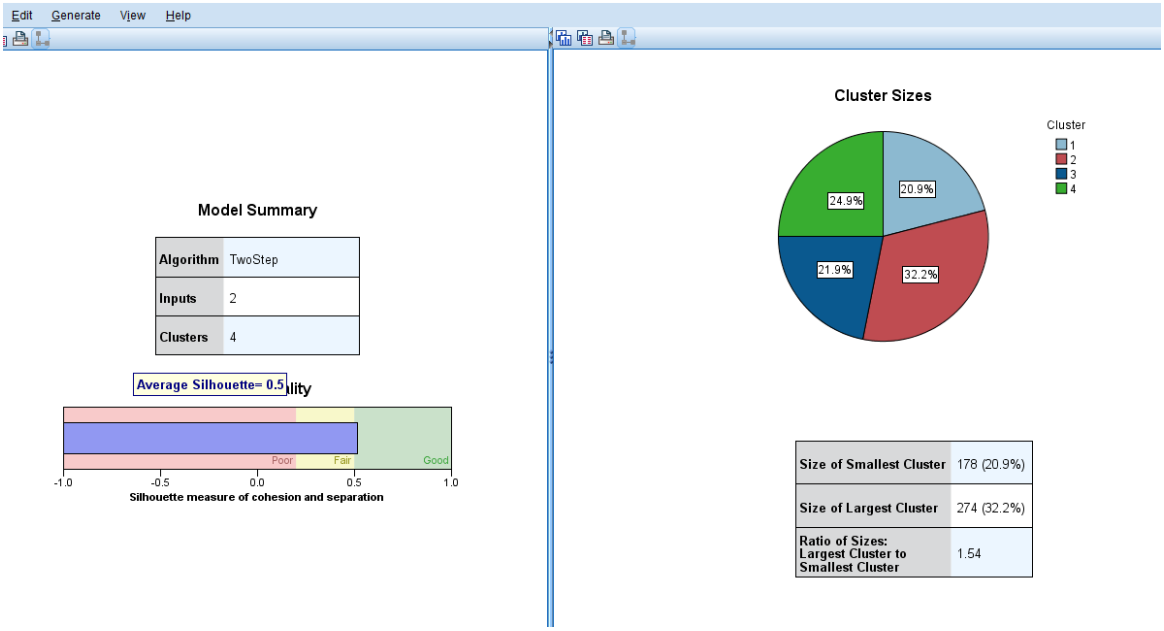
**A copy of the reduced SCEQ.**

**To what extent do the following behaviours, thoughts, and feelings describe you, in this course?**

1. Making sure to study on a regular basis
2. Putting forth the effort
3. Staying up on the readings
4. Looking over class notes between classes to make sure I understand the material
5. Being organized
6. Finding ways to make the course material relevant to my life
7. Applying course material to my life
8. Finding ways to make the course interesting to me
9. Raising my hand in class
10. Asking questions when I don't understand
11. Participating actively in small-group discussions
12. Getting a good grade
13. Doing well on exams
14. Being confident that I can learn and do well in the class

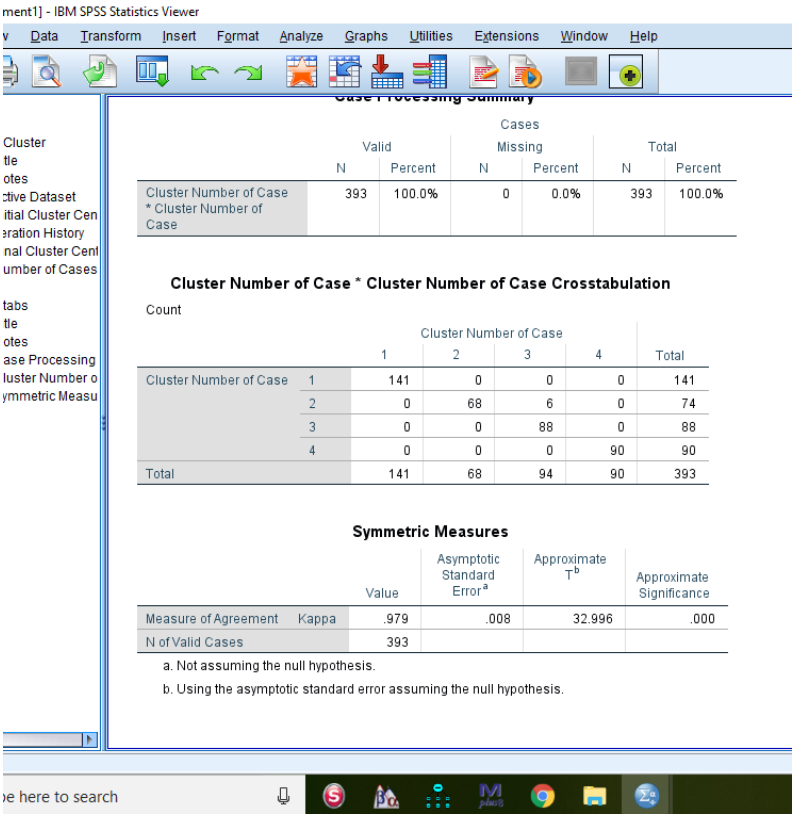
# Appendix Five

## Screen shot of the silhouette coefficient indicating good fit.



# Appendix Six

## Screen shots of the different kappa values



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| Cluster Number of Case * Cluster Number of Case | 393 | 100.0% | 0 | 0.0% | 393 | 100.0% |

**Cluster Number of Case * Cluster Number of Case Crosstabulation**

Count

| | | Cluster Number of Case | | | | |
|---|---|---|---|---|---|---|
| | | 1 | 2 | 3 | 4 | Total |
| Cluster Number of Case | 1 | 141 | 0 | 0 | 0 | 141 |
| | 2 | 0 | 68 | 6 | 0 | 74 |
| | 3 | 0 | 0 | 88 | 0 | 88 |
| | 4 | 0 | 0 | 0 | 90 | 90 |
| Total | | 141 | 68 | 94 | 90 | 393 |

**Symmetric Measures**

| | | Value | Asymptotic Standard Error[a] | Approximate T[b] | Approximate Significance |
|---|---|---|---|---|---|
| Measure of Agreement | Kappa | .979 | .008 | 32.996 | .000 |
| N of Valid Cases | | 393 | | | |

a. Not assuming the null hypothesis.

b. Using the asymptotic standard error assuming the null hypothesis.

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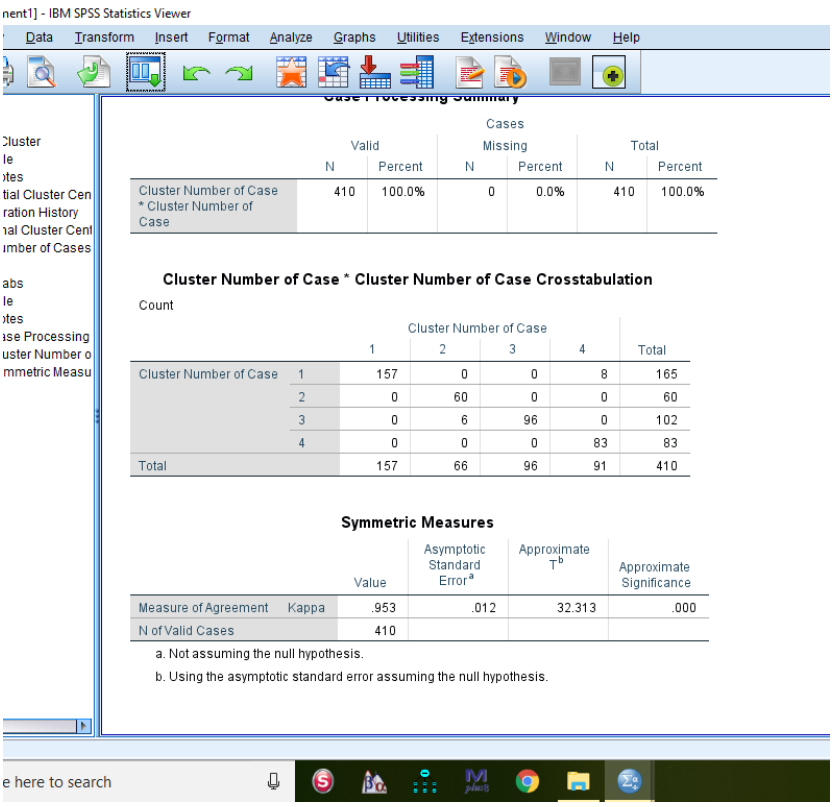

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| | Valid | | Missing | | Total | |
|---|---|---|---|---|---|---|
| | N | Percent | N | Percent | N | Percent |
| Cluster Number of Case * Cluster Number of Case | 410 | 100.0% | 0 | 0.0% | 410 | 100.0% |

**Cluster Number of Case * Cluster Number of Case Crosstabulation**

Count

| | | Cluster Number of Case | | | | |
|---|---|---|---|---|---|---|
| | | 1 | 2 | 3 | 4 | Total |
| Cluster Number of Case | 1 | 157 | 0 | 0 | 8 | 165 |
| | 2 | 0 | 60 | 0 | 0 | 60 |
| | 3 | 0 | 6 | 96 | 0 | 102 |
| | 4 | 0 | 0 | 0 | 83 | 83 |
| Total | | 157 | 66 | 96 | 91 | 410 |

**Symmetric Measures**

| | | Value | Asymptotic Standard Error[a] | Approximate T[b] | Approximate Significance |
|---|---|---|---|---|---|
| Measure of Agreement | Kappa | .953 | .012 | 32.313 | .000 |
| N of Valid Cases | | 410 | | | |

a. Not assuming the null hypothesis.

b. Using the asymptotic standard error assuming the null hypothesis.

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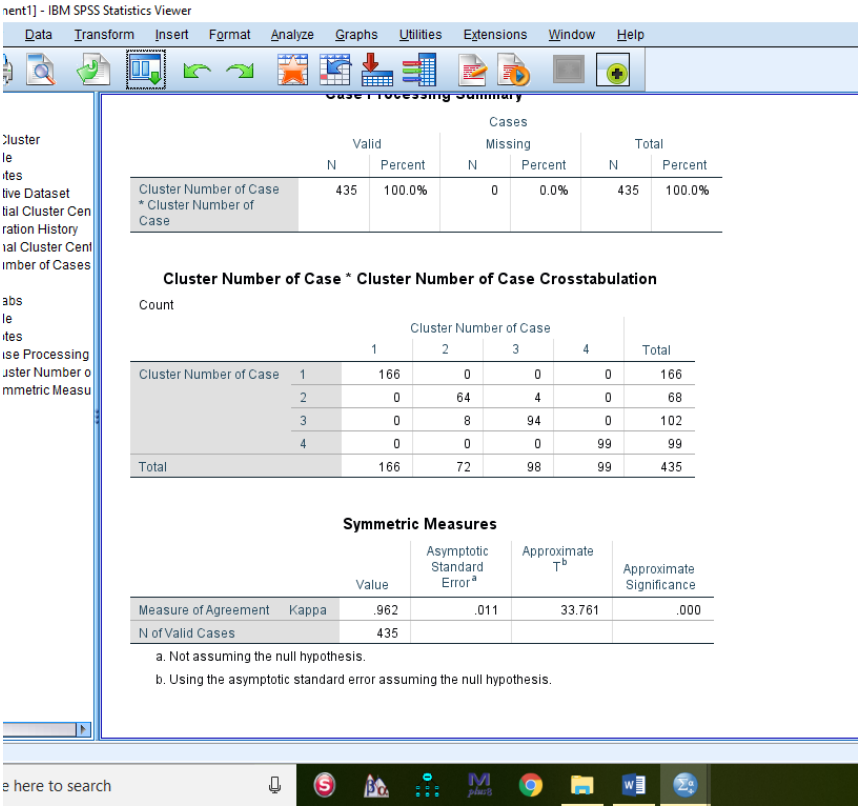
## Continued - Screen shots of the different kappa values



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Case Processing Summary

| | Cases | | | | | |
|---|---|---|---|---|---|---|
| | Valid | | Missing | | Total | |
| | N | Percent | N | Percent | N | Percent |
| Cluster Number of Case * Cluster Number of Case | 435 | 100.0% | 0 | 0.0% | 435 | 100.0% |

**Cluster Number of Case * Cluster Number of Case Crosstabulation**

Count

| | | Cluster Number of Case | | | | |
|---|---|---|---|---|---|---|
| | | 1 | 2 | 3 | 4 | Total |
| Cluster Number of Case | 1 | 166 | 0 | 0 | 0 | 166 |
| | 2 | 0 | 64 | 4 | 0 | 68 |
| | 3 | 0 | 8 | 94 | 0 | 102 |
| | 4 | 0 | 0 | 0 | 99 | 99 |
| Total | | 166 | 72 | 98 | 99 | 435 |

**Symmetric Measures**

| | | Value | Asymptotic Standard Error[a] | Approximate T[b] | Approximate Significance |
|---|---|---|---|---|---|
| Measure of Agreement | Kappa | .962 | .011 | 33.761 | .000 |
| N of Valid Cases | | 435 | | | |

a. Not assuming the null hypothesis.

b. Using the asymptotic standard error assuming the null hypothesis.

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