The relation between academic commitment, self-determination and academic achievement in Grade 11 and Grade 12 Learners

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The relation between academic commitment, self-determination and academic achievement in Grade 11 and Grade 12 learners

by

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Submitted in partial fulfilment of the requirements for the degree

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DEDICATION

This is dedicated to every PWMS,

don't let scars stop you from dreaming.

Acknowledgements

First and foremost, I would like to thank my Heavenly Father for carrying me throughout this process. You have taught me that nothing is impossible or without reason and that Your love is unfathomable. Thank you for all the lessons that You have taught me, especially in the past year and a half. I would not have been able to do this without You.

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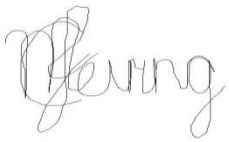
Declaration of Originality

I, Corné Jeanne Meiring (student number: 23020157) hereby declare that all of the resources consulted are included in the reference list and that the present study titled:

The relation between academic commitment, self-determination and academic achievement in grade 11 and grade 12 learners

is my original work. This thesis submitted in order to meet the partial requirements for the degree: Philosophia Doctor (Educational Psychology) was not previously submitted by me for any other degree at another university



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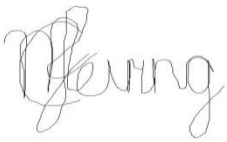
Ethics Statement

The author, whose name appears on the title page of this thesis, has obtained, for the research described in this work, the applicable research approval. The author declares that she has observed the ethical requirements in terms of the University of Pretoria's Code of ethics for researchers and the Policy guidelines for responsible research.



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Summary

The purpose of the present study was to assess the associations between academic commitment theory (operationalised as meaningful commitment) (Human-Vogel & Rabe, 2015), and self-determination theoretical constructs (operationalised through need support, need satisfaction, autonomous self-regulation and perceived competence) (Deci & Ryan, 2000) in predicting the academic achievement levels of South African Gr 11 and 12 learners. Data was collected on two occasions; participants initially completed a survey and I then obtained their average academic marks. Participants reported average to higher levels of measured constructs and responses on all measurements displayed a normal distribution.

I used path analysis to test two hypothesised and several additional models. The results indicated that neither autonomous self-regulation nor meaningful commitment directly predicted academic achievement but that both constructs indirectly predicted academic achievement through basic psychological need satisfaction and perceived competence. Meaningful commitment, furthermore, predicted twice as much variance in need satisfaction as autonomous self-regulation, and was a significant predictor of autonomous motivation.

The findings of this study provide some insight into the role of meaning in self-determination theory, as well the organising role of meaningful commitment in self-regulating behavioural choices. These findings may also help educators and policy makers to create learning environments in which learners' need for meaning and self-determination is supported, so that they can achieve academic success. Methodologically, the present study contributes to the validation of the meaningfulness subscale and the application of self-determination theory instruments in a South African context.

Keywords

- Meaningfulness
- Autonomous motivation
- Basic psychological needs
- Self-Determination theory
- Gr 11 and 12 learners
- South Africa
- Meaningful commitment
- Autonomy
- Competence
- Relatedness

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Chapter 1
Introduction

1.1 INTRODUCTION

The South African National Development Plan (2011) states that:

> By 2030, we seek to eliminate poverty and reduce inequality. We seek a country wherein all citizens have the capabilities to grasp the ever-broadening opportunities available. Our plan is to change the life chances of millions of our people, especially the youth; life chances that remain stunted by our apartheid history (National Planning Commission, 2011, p. 5).

South African high school learners, as all learners globally, must achieve academic success in school to make the most of future opportunities. However, they generally perform worse than they should (e.g. Branson, Hofmeyr & Lam, 2013), and some of the reasons have been explained in the literature (e.g. Fleisch, 2008). In the present study, I consider the role that motivation plays in the academic achievement of Grade 11 and 12 learners. I will take a self-determination theory (SDT) perspective on motivation to examine how type and quality of motivation predict academic achievement. SDT typically emphasises the importance of basic psychological need satisfaction, autonomous and controlled motivation, and goal content in motivation (Deci & Ryan, 1985/2000), but researchers generally pay less attention to the role of meaning in motivation. Some exceptions include the work of Weinstein, Ryan and Deci (2012) who provide theoretical oversight on meaningfulness in SDT and a limited amount of empirical investigations in the career (Losier & Koestner, 1999), the political (Gagné Senécal & Koestner, 1997) and educational domain (Davis, Kelley, Kim, Tang & Hicks, 2016).

It stands to reason that learners who experience their learning as meaningful, should theoretically be more motivated (McCombs, 2001; Thuen & Bru, 2000; Paunesku, Walton, Romero, Smith, Yeager & Dweck, 2015). Researchers have pointed out that meaning informs which goals and aspirations people choose (Reker & Wong, 2012; Steger, 2009), enhances regulation of behavioural choices (MacKenzie & Baumeister, 2014) and is associated with subjective well-being (Compton, 2000). In the present study, I consider whether meaning is associated with basic psychological need support, perceived competence, and autonomous motivation, Particularly, I explore whether meaningful commitment adds unique predictive variance to academic achievement, in addition to autonomous motivation.

1.2 BACKGROUND

1.2.1 CONTEXT OF THE PRESENT STUDY

South African learners underperform academically as indicated in local (e.g. Department of Basic Education, 2014) and international reports (e.g. Human Sciences Research Counsel, 2012). Prior

investigations highlight several reasons for poor South African learner performance, including: English language proficiency (Lam, Arington & Leibrandt, 2011; Howie, Scherman & Venter, 2008), school violence (Zulu, Urbani, Van der Merwe & Van der Walt, 2004), being a caregiver to others who have AIDS (Cluver, Operanio, Lane & Kganaka, 2011), teenage pregnancy (Branson et al., 2013), parent literacy level (Liddell & Rae, 2001), ineffective school leadership (Bush, Joubert, Kiggundu & van Rooyen, 2009) and under resourced school environments (Fleich, 2008) (see chapter 2, section 2.2 for comprehensive overview).

Most South African learners come from a poor socio-economic background. Their school attendance is hampered by factors such as poverty, and academic achievement is frustrated by many social problems in their community. For example, a lack of nutritional resources and family discord is related to academic underachievement (Chinyoka, 2014; Unger, Brown, Tressell & McLeod, 2000). It was indicated in the most recent national census that, 54% of all children in South Africa lived below the poverty line in 2011, which is considered to be a minimum of R 671 ([1]$48.9 or €46.5) per person per month (Statistics South Africa, 2012) and that one out of every three children in South Africa also experience, or are at risk of experiencing hunger (Unicef, 2013). South Africa has the highest rate of HIV infections in the world, with 5.7 million people that are infected (Unicef, 2012). South Africa, furthermore, has approximately 3.7 million orphans (Unicef, 2013) where one in five children have lost one or both parents, and 122 000 children live in child headed households (Meintjies, Hall, Marera & Boulle, 2009). Many South African children, in addition, are exposed to family violence (Barbarin, Richter & de Wet, 2001), with 50 000 reported crimes against children, of which 40 % is of a sexual nature (Unicef, 2012). Against this backdrop, it seems reasonable to expect that many children's basic psychological needs might not be adequately supported, and that there might be very little reason for them to be motivated to achieve academic success, or to find academic activities meaningful for that matter.

Learners who experience higher levels of basic psychological need support, in the form of autonomy, competence and relatedness reach positive academic outcomes (Black & Deci, 2000). People, however, display a stronger desire for basic psychological need satisfaction when they are exposed to financial insecurity and environmental safety concerns (Chen, Van Assche, Vansteenkiste, Soenens & Beyers, 2015), and one could argue that the socio-economic difficulties that South African learners face, may lead to lower levels of basic psychological need support from others. No other researcher has, however, to the best of my knowledge investigated to what extent South African learners experience basic psychological need support, but other authors have, interestingly enough, reported average to above average levels of need satisfaction in South African learners and adolescents (Chen, Van Assche et al., 2015; Roman, Davids, Moyo, Schilder, Lacante & Lens, 2015). Deci and Ryan (2000), said that the basic psychological need satisfaction, is not only dependent on need support from others but also "…the extent that the individual has sufficient inner resources to find or construct the necessary nourishment" (p. 229). It, therefore, seems important to investigate the extent to which South African learners experience basic psychological need support, the association between need satisfaction and academic

[1] Based on exchange rates on 1 January 2017: 1 ZAR = 13.7 USD and 1 ZAR = 14.4 EUR (XE currency converter, 2017).

achievement, and to determine which other variables, in addition to need support, could lead to higher levels of need satisfaction.

It is for instance noticeable that some South African learners excel academically despite unfavourable contextual realities and, arguably, lower levels of need support (e.g. eNCA, 2014). They display what researchers call academic resilience, which refers to "a student's ability to deal effectively with academic setbacks, stress and study pressures" (Martin, 2002, p. 35). In a South African study, Dass-Bailsford (2005) reported that: "Participants indicated that they were not only individuals who had autonomy but they also held the conviction that they could actively structure their lives and direct their future with self-confidence and self-determination" (p. 581). It, therefore, seems important for academically resilient learners in South Africa to experience feelings of autonomy (i.e., derived from basic psychological need support), self-determination (i.e., autonomous self-regulation) and the capacity to structure their own lives. In the present study, I argue that meaningful commitment allows people to structure their own lives because it helps them to feel that their behavioural decisions or commitments reflect their identity self-descriptions. More precisely, people's ability to construct meaning in their lives allow them to experience coherence and predictability (Heine, Proulx & Vohs, 2006), offering structure in life.

I will therefore explore to what extent meaningful commitment contribute to academic resilience, and academic achievement, in addition to basic psychological need satisfaction. Several authors have noted that the way people think about themselves in the future can be a powerful motivational force for present behaviour (Miller & Brickman, 2004). This is because the future self constrains the choices and goals people make in the present. Previous studies suggest that academically resilient South African learners display high levels of academic motivation because they perceive educational achievement as a mechanism to rise above their current situation through their future aspirations (Dass-Bailsford, 2005; Phasa, 2010), and that South African resilient youth display a powerful identity and purpose (Theron & Theron, 2014). What these findings imply, is that learners who have future educational aspirations, may experience learning in the present as more meaningful. Such meaning may be as important to motivation than basic need support. Some tentative support for this argument comes from Human-Vogel and Rabe (2015) who showed in a university sample, that meaningful commitment was associated with a clear sense of self, and made a difference to the self-regulation behaviours students engage in, such as setting goals.

Although both need satisfaction (e.g. Betoret & Atiga, 2011), autonomous self-regulation (e.g. Ratelle, Guay, Vallerand, Lacrose & Senecal, 2007) and meaning (Davis et al., 2016) has been shown in separate studies to be relevant to academic outcomes, the role of meaning in motivation as discussed in SDT is not entirely clear. Specifically, in contrast to several authors on meaning (Andersen, Chen & Carter, 2000; Baumeister, 1991; Frankl, 1978, Heine et al., 2006), SDT authors question whether meaning is a basic psychological need (e.g. Sheldon, Elliot, Kim and Kasser, 2001; Weinstein, Ryan et al., 2012). Part of this problem, which I shall discuss in section 1.2.2.4, is a lack of clarity on how to define meaning. In the following sections, I will discuss meaning as a need in addition to autonomy, competence and relatedness and the association thereof with autonomous motivation.

1.2.2 KEY CONCEPTS IN THE PRESENT STUDY

1.2.2.1 Basic psychological needs in SDT

SDT is a macro-theory on motivation in which it is proposed that all people need to feel like they can initiate their behaviour (i.e., *autonomy*), that they are effective in their own environments (i.e., *competence*) and, they are related to and care for other people (i.e., *relatedness*) (Deci & Ryan, 2000). Autonomy, competence, and relatedness are innately part of human nature, and help people to experience and psychological well-being and growth, throughout their lives regardless of culture, race, and age (Deci & Ryan, 2002). It seems obvious that the environments can either support (i.e., need-supportive), deprive or keep people from having their needs met (i.e., need-depriving or need-thwarting) (Ryan & Deci, 2006). Teachers and parents may therefore actively support the satisfaction of basic needs or uninterested and opposed to it (Vansteenkiste & Ryan, 2013).

SDT theorists specified these three needs, because it is the least amount of needs that explain the largest amount of outcomes in people, across age, genders and culture groups (Sheldon et al., 2001; Vansteenkiste, Niemiec & Soenens, 2010). They do not deny that other needs may also be regarded as basic needs in the future, but argue that "… a new need would only be added following strong theoretical arguments and empirical support" (Vansteenkiste et al., 2010, p. 131). In the present study, I attempt to demonstrate that meaningfulness as a need also plays an important role in motivation and psychological well-being.

1.2.2.2 Meaningfulness as a need

In the present study, I argue – as several others have - that meaningfulness is also an important human need (e.g. Andersen et al., 2000; Baumeister, 1991; Frankl, 1978; Heine et al., 2006). Based on a tripartite conceptualisation of meaning (George & Park, 2016; Heintzelman & King, 2014; Martella & Steger, 2016), I propose that people require meaning in their life, because they need to feel that their daily decisions are somehow *coherent* or, in other words, form part of a pattern of choices that allow them to realise their future plans or *purpose* (Heine et al., 2006; Heintzelman & King, 2014; Reker & Wong, 1988); and that meaning make people choose goals that are *significant* and *purposeful*. From this perspective, life is meaningful when life is experienced as coherent (Antonovsky, 1987; Heine et al., 2006), purposeful (Steger, 2012, McKnight & Kashdan, 2009) and significant (George & Park, 2016).

In the present study, I also propose that people experience meaningfulness or coherence on different levels. More specifically, I draw on the work of several authors (Baumeister, 1991; MacKenzie & Baumeister, 2014; Park & Folkman, 1997; Schnell, 2009), who propose that people experience global or higher level meaning (also referred to as higher or ultimate meanings), and situational or lower level meaning (lower-level meanings or perceptions). In the present study, I specifically consider the effects of high-level meaning (i.e., long-term concerns) on motivation. More precisely, I argue that purpose and identity are closely related, and help people to experience higher-level meaning and coherence in life by offering direction in life (McKnight & Kashdan, 2009; Wong, 2012).

In terms of identity, I differentiate between the *self* as the human capacity for reflective thinking (Leary & Tagney, 2003) and *identity* as "to know itself as an object, and to use this awareness and knowledge to regulate behaviour" (Human-Vogel, 2013, p. 518). I refer to identity self-descriptions, when speaking about objective self-knowledge in the present study, and argue that people have objective self-knowledge when they are self-differentiated (Skowron & Friedlander, 1998). People are self-differentiated when they can make rational decisions according to their own personal standards or values (see section 2.7.2.5 chapter 2). Differently stated, people develop an understanding of how they objectively describe themselves on an identity level (i.e., self-descriptions), as influenced by purpose through the reflective function of the self.

Both identity and purpose inform future orientated thinking (Adams & Marshall, 1996; Sica, Crocetti, Ragozini, Aleni & Serafini, 2016; Steger, 2012). People do not only consider how they would like to describe themselves presently, but also in the future. Adolescents, specifically, need to think about the future, to make important future decisions, such as deciding which career to pursue (Blakemore & Choudhury, 2006; Nurmi, 1991). I, therefore, draw on the work of possible self/identity theorists (Higgins, 1987; Hoyle & Sherril, 2006; Markus & Nurius, 1986; Oyserman, Bybee, Terry & Hart-Johnson, 2004) and argue that people formulate future identity goals (e.g. I want to be a successful person), based on future self-descriptions (e.g. I want to be a successful learner, sportsman or caregiver), in order to reach future outcomes.

I also argue in this study, that people persistently strive to fulfil future identity goals, because they need to feel that their lives in general are coherent and predictable (Demerath, 2006; Gregg et al., 2011; Heine et al., 2006). Said differently, people need an identity that provides sameness or continuity across situations and time (Erikson, 1968) because perceived incoherence leads to a "feeling of the absurd" (Heine et al., 2006, p. 206). Indeed, several research findings indicate that people report poor-psychological well-being when they experience identity incoherence (North & Swann, 2009; Vignoles, Schwartz & Luyckx, 2011). In addition, I propose that future identity goals have an enduring influence on motivation, because unlike other goals (e.g. "I want to solve this mathematics problem"), future identity goals (e.g. "I want to be a successful person") do not have a definite attainment level (Gollwitzer, Marquardt, Scherer & Fujita, 2012). People therefore need to persistently engage in identity-related behaviour (e.g. I need to solve this mathematics problem today, pass a language test tomorrow and so forth), to feel that they are acting in accordance with their identity, and subsequently experience coherence within themselves.

1.2.2.3 Identity regulation facilitating meaningfulness

I therefore refer to identity a source of meaning making (Oyserman & Markus, 1990; Adams & Marshall, 1996), that fulfils an executive function because it directs or self-regulates future goals and behavioural decisions that are not otherwise activated by stimuli in the immediate environment (e.g. Baumeister, Schmeichel & Vohs, 2007; Oyserman, 2015). Hence, I propose that identity helps people to experience sense of coherence in life, because it influences which goals they choose to engage with, based on whether it is significant or not in relation to their future identity goals. Stated differently, I propose that

people make meaningful commitments to behaviours that are coherent with their identity self-descriptions, to experience meaning in life (i.e., coherence, purpose, and significance)

In the present study, I utilise a hierarchical and cybernetic self-regulatory approach to motivation as part of my conceptual framework (see chapter 2 section 2.9.4), and argue that identity content has a more enduring influence on behavioural decisions than intermediate task-related, and lower-level behavioural goals (Carver & Scheier, 1982; Lord, Diefendorff, Schmidt & Hall, 2010; Human-Vogel & Rabe, 2015, Powers, 1973; Vallacher & Wegner, 1987) More specifically, I argue that *higher-order* more abstract identity-related content (e.g. I want to be a successful person) informs identity-related future goals (e.g. I want to be a successful learner), which has a long-term influence on which *intermediate-level* academic (e.g. wanting to perform well in a subject), and *lower-level* behavioural (e.g. the actual behavioural act of studying hard) goals people commit to. *Micro-level* regulation in turn concerns emotional experiences during goal pursuits (e.g. satisfaction or enjoyment).

I also refer to the work of some authors (Human-Vogel, 2013, Lieberman, 1998) who propose that there are differences between identity, goal, and behavioural commitment. I argue that one should not only consider the extent to which people are motivated and commit to academic behaviour (e.g. studying hard), based on intermediate academic goal commitment (e.g. I want to do well in maths) but also whether future identity goals (i.e. I want to be a successful learner) inform these behavioural commitments. For example, a learner could decide to study for a test one afternoon, not because he has the future identity goal of being a successful learner, but because he wants to avoid punishment, or to avoid loosing his place in the rugby team (i.e. he has the future identity goal of being a skilled rugby player). Not considering the effect of identity commitment on behavioural commitment, therefore, gives an incomplete picture of *long-term* motivation.

In the present study, I used the meaningfulness subscale of the academic commitment scale (Human-Vogel & Rabe, 2015) to operationalise the extent to which learners feel that their academic behaviours are meaningful. Meaningfulness in this instance occur when academic behaviours are "… experienced as reflective of the self and consistent with self-expression" (Human-Vogel & Rabe, 2015, p. 4), or differently said coherent with identity self-descriptions.

1.2.2.4 SDT and meaningfulness

I give an overview of how meaning is conceptualised in SDT in section 2.6.7 in chapter 2. SDT authors predominantly, operationalise meaningfulness as reflecting *psychological well-being* or *eudaimonia* (e.g. Bailey & Phillips, 2015; Huta & Ryan, 2010; Vansteenkiste, Lens, De Witte, De Witte & Deci, 2004; Vansteenkiste, Lens, De Witte & Feather, 2005; Weinstein, Deci & Ryan, 2011 Weinstein, Przybylski & Ryan, 2012). They also argue that people experience meaningfulness when engaged in *autonomous motivation* and when they pursue *intrinsic goals or aspirations* (Weinstein, Ryan et al., 2012), and that people experience internalisation when receiving *meaningful rationale* (Deci, Eghrari, Patrick & Leone, 1994). However, no SDT theorist to the best of my knowledge, have argued that meaningfulness (as defined in the present study) is a basic psychological need. Instead, they argue that meaningfulness,

unlike autonomy competence and relatedness do not present specific circumstances for need satisfaction, nor necessarily speak to the innate or universal nature of human beings (Sheldon et al., 2001; Weinstein, Ryan et al., 2012). In the present study, I question these assumptions and propose that meaningfulness is an important human need, that allow people to experience coherence in their lives when they feel that their goals are purposeful and significant.

I specifically argue that meaningfulness or coherence, like autonomy, competence and relatedness is an important of even innate need. I argue that meaningfulness like autonomy, relatedness and competence (i) is critical throughout life, (ii) that the extent to which people benefit from meaningfulness is not always dependent on conscious processing and (iii) that meaningfulness is universally necessary for optimal wellbeing (Vansteenkiste et al., 2010). I therefore, concur with other authors who propose that all people, regardless of their age, culture, or gender, need to feel that their lives are coherent, or form part of a predictable pattern (Antonovsky, 1987; Heine et al., 2006; Sommer, Baumeister & Stillman, 2012). For example, if one consider psychosocial developmental theory (Erikson, 1968), then one would notice that all developmental phases from infancy (i.e. trust vs mistrust) to maturity (i.e. ego integrity vs. despair), concerns an evaluation of how one perceives one's place in the world and if this understanding forms a coherent pattern. Moreover, several authors have already proposed that people are motivated on an unconscious level to experience coherence (e.g. Baumann & Kuhl, 2002; Bowers, Regehr, Balthazard & Parker, 1990), and there seems to be some support that the need for coherence is universal (e.g. English & Chen, 2007; Heine et al., 2006), with cultural differences in how coherence is facilitated (Suh, 2002).

I propose that meaningfulness as a need is satisfied, when people experience coherence between their identity-self-descriptions and academic goals and behaviours (i.e., meaningful commitment). It makes sense, why SDT theorists argue that meaningfulness does not pose specific circumstances for need satisfaction, because as mentioned before, they predominantly consider meaningfulness as resembling a well-being outcome that follows autonomous motivation or intrinsic goal pursuits. Indeed, it is important to note that SDT authors have directly (Weinstein, Ryan et al., 2012) and indirectly (Deci & Ryan, 2000, Ryan & Deci, 2011) proposed that internalisation and the experience of autonomous motivation create a sense of coherence in life. Hence, it appears as if SDT authors propose that people in any event experience meaningfulness need satisfaction or experience coherence, when they are autonomously motivated.

In the present study, however, I question whether internalisation as described in SDT specifically include higher-level meaning-making as informed by identity content. Weinstein, Ryan et al. (2012), for instance, say that "… SDT suggests that meaning will be facilitated by mindfulness, by an open, receptive awareness" (p. 88) and later "…they may be reframing and re-evaluating their personal meanings with some regularity" (p. 89). SDT theorists, furthermore, define mindfulness as: "in mindfulness, and true self-determination, there is no fixed concept of self to protect or enhance; "all the facts are friendly" (Rogers, 1961, p. 25), and all inform one's experiences and behaviours" (Ryan & Brown, 2003, p. 75). These statements seem to imply that coherence produced internalisation (i) do not necessarily include identity content and (ii) SDT theorists refer to lower-level meaning or coherence and not necessarily

higher-order identity meaning. In the following sections, I also refer to self-concordance and identity literature in SDT, to explain why I argue that a sense of coherence produced by internalisation differs from coherence provided by higher-order identity regulation (i.e., meaningful commitment).

1.2.2.5 An internalisation continuum: autonomous and controlled motivation

SDT theorists differentiate between intrinsic motivation (i.e., when people do activities because it is interesting and inherently pleasurable) and extrinsic motivation (i.e., when people want to reach an instrumental or externally imposed outcome) (Niemiec & Ryan, 2009). People, however, cannot always experience intrinsic motivation, they also need to partake in activities because other people or circumstances expect them to do so. People, therefore, also need to have an effective way of dealing with extrinsic motivation.

People are growth oriented beings according to SDT, who continually strive to internalise extrinsically imposed tasks so that they feel that they that they have a choice over their own behaviour (Deci & Ryan, 2000). People who experience basic psychological need satisfaction are able to experience autonomous instead of controlled motivation during externally imposed tasks. More precisely, motivation according to SDT theorists occurs on an internalisation continuum, where people do activities for more *controlled* reasons such as, placing internal constraints on oneself (i.e., introjected regulation), or because of external contingencies such as rewards and punishments (i.e., external regulation), or more *autonomous* reasons such as, (i) it is interesting and pleasurable (i.e., intrinsic regulation), (ii) identifying and agreeing with the instrumental value of the goal (i.e., identified regulation), and (iii) identifying and agreeing with goals and understanding how it relates to all other parts of the self (i.e., integrated regulation) (Deci & Ryan, 2000; Vansteenkiste et al., 2010).

From this it is clear that it is important for people to feel like they can agree and identify with the outcome of externally imposed tasks, to experience internalisation (Deci & Ryan, 1985; Pelletier, Tuscon & Haddad, 1997). It makes sense one can only identify with an outcome, if it relates to one's self-descriptions. It is my understanding that self-concordance is one instance of SDT, where researchers specifically investigate the association between autonomous motivation and self-content.

1.2.2.6 Self-concordance and identity in SDT

Deci and Ryan (2000) refer to self-concordance as a high level of integrated functioning. People experience self-concordance when they autonomously pursue goals that reflect their enduring interests and values, and in the process experience basic psychological need satisfaction (Sheldon & Elliot, 1999; Sheldon & Kasser, 1998; Sheldon & Houser-Marko, 2001; Sheldon, 2014). Sheldon and colleagues, operationalise self-concordant goal selection in their studies, by asking participants to list their personal projects (Little, 1993) or strivings (Emmons, 1989), and then assessing whether these personal projects or strivings are pursued for autonomous or controlled reasons (e.g. Sheldon & Houser-Marko, 2001; Sheldon, Elliot, Ryan, Chirkov, Kim, Wu, Demir & Sun, 2004; Sheldon & Kasser, 1995; Sheldon, Kasser,

Share & Smith, 2002). Personal projects, goals, or strivings are therefore self-concordant, when they are autonomously pursued (Sheldon, 2014).

Sheldon, Prentice, Halusic and Schüler (2015), consequently, argue that theoretically, "self-concordant goals simply feel like they reflect one's deeper personality" (p. 336). This statement as well as the methodological procedures followed to determine self-concordance arguably seems to imply, that *all* autonomously motivated personal projects or goals reflect identity content. In the present study, I question whether *all* personal goals or projects reflect identity content. First of all, it is not a foregone conclusion that participants will specifically list their enduring interests and values, as informed by identity, when naming personal goals or projects (Koestner, Lekes, Powers & Chicoine, 2002) and that personal goals and projects, are always indicative of identity content (McAdams, 1996). Furthermore, Sheldon (2014), mentions that one of the advantages of measuring self-concordant goal selection is that "…it does not require people to have direct insight into whether their goals fit their "deep" personality; it merely requires people to be able to report that they feel some sense of pressure or constraint in pursuing their goals and that they do not really enjoy or believe in their goals" (p. 355). It therefore makes sense why Sheldon, Prentice et al. (2015), have acknowledged that the theoretical assumption of self-concordant goal selection representing a deep personality-goal fit has not been directly tested.

To illustrate, a Gr 12 learner with an identity self-description of being a hardworking person, decides that he would rather go to a party than study for an upcoming test, because he wants to meet someone to go to the Gr 12 farewell dance with him. He autonomously makes this decision even though it contradicts of his identity self-descriptions, because it will allow him to reach the personal goal of meeting a potential partner for the dance. His decision to go to the party, however, reflects one set of behavioural decisions, based on a short-term personal goal. I propose that this learner will more often than not, choose to partake in schoolwork instead of going to parties, because his identity self-descriptions will have a more enduring or long-term influence on his overall behavioural decisions.

In addition, SDT theorists predominantly discuss identity within a developmental context (La Guardia, 2009; Luyckx, Vansteenkiste, Goossens & Duriez, 2009; Ryan & Deci, 2011; Soenens, Berzonsky, Dunkel, Papini & Vansteenkiste, 2011; Soenens, Berzonsky, Vansteenkiste, Beyers & Goossens, 2005; Soenens & Vansteenkiste, 2011). They also define identity as the set of values and aspirations that people use to define themselves (Soenens and Vansteenkiste, 2011) or refer to life roles when discussing identity (La Guardia, 2009; Ryan & Deci, 2011). SDT theorists acknowledge that people have unique personality and interests (La Guardia, 2009), and argue that people adopt identities with the purpose of fulfilling basic psychological needs (La Guardia, 2009; Luyckx et al., 2009). The extent to which someone's identity facilitates basic psychological need satisfaction depends on whether identity commitments are autonomously pursued, and whether identity-related goals include intrinsic aspirations (Soenens & Vansteenkiste, 2011).

The problem with this description of identity by SDT authors, is that it does not necessarily consider the impact of future goals on motivation in addition to autonomous motivation and need satisfaction. In my conceptual framework, I draw on the work of Vallerand (1997), and propose that autonomous motivation

(as operationalised in the present study) forms part of short-term behavioural or lower-level self-regulation, while meaningfulness forms part of long-term higher-order self-regulation (cf. chapter 2 section). I argue that it is important to consider how higher-, intermediate- and lower-level self-regulation influence learners' behavioural decisions, in order to obtain a complete understanding of long-term motivation.

1.3 PROBLEM STATEMENT AND RATIONALE

It makes sense that the way someone knows and describes him/herself, (i.e., their identity), will affect the actions that they take. After all, if I describe myself as reliable, I will also try to behave in a reliable manner. As mentioned in section 1.2.2, literature supports the view that meaningful commitments help people to feel that their lives are overall coherent, and predictable, and it also gives them the motivation to pursue their goals. In chapter 2 section 2.4, I briefly review several academic motivational theories (e.g. social cognitive-, achievement goal-, attribution theories) that, arguably, do not adequately account for the role of meaning in human motivation and self-regulation. SDT theorists, moreover, mostly discuss meaningfulness in relation to personal relevance and eudaimonic well-being (cf. section 1.2.2.3), but generally do not specifically consider whether meaning, as conceptualised in the present study, motivate people in addition to autonomous motivation, and the role of meaning as a need in addition to other basic psychological needs.

I propose in the present study, that it might be problematic that SDT theorists do not discuss meaningfulness as a basic or fundamental psychological need (e.g. Sheldon et al., 2001; Weinstein, Ryan et al., 2012), even though other authors have proposed that meaningfulness is an important need (e.g. Andersen et al., 2000; Baumeister, 1991; Heine et al., 2006) because it gives coherence, purpose, and significance in life. I concur with SDT theorists, that people have an innate need to feel autonomous, competent and related during tasks to experience psychological well-being. In addition, I argue that it is also important for people to feel they have a coherent identity, because they need to feel that how they describe themselves today in this situation will be the same as how they will describe themselves tomorrow in other situations (Erikson, 1968). I therefore propose that autonomy, competence, and relatedness do not necessarily adequately capture the need for meaning or coherence in life, or how people would like to continue describing themselves in the future. It seems important to consider the impact of meaning in motivation, because literature shows that people who experience identity incoherence experience psychological distress (e.g. Swann, 2012), as well as lower levels of motivation (Oyserman & Destin, 2010). Hence, I argue that SDT can be advanced, by understanding the association between meaningfulness and other basic psychological needs.

It is important to mention that SDT theorists propose that people experience coherence when engaged in internalisation and autonomous self-regulation (e.g. Weinstein, Ryan et al., 2012). Indeed, people would have to understand how and if the outcome externally imposed tasks relate to the self, before endorsing the activity. However, I refer to self-concordance, an example of integrated functioning as well as identity literature in SDT (cf. section 1.2.1.3), and note that SDT authors usually refer to personal goals or projects when investigating self-concordance, or alternatively discuss identity within a

developmental context. I draw on the work of several authors, who argue that there are different levels of coherence (Baumeister, 1991; MacKenzie & Baumeister, 2014; Park & Folkman, 1997; Schnell, 2009), and I propose that internalisation in SDT, leads to lower-level coherence (i.e., coherence between day to day behavioural decisions, based on personal goals), but not necessarily higher-level coherence as facilitated by meaningful commitment (i.e., coherence between future identity goals and behavioural decisions). To illustrate, a learner may autonomously choose to go to a party, because it is enjoyable and interesting (i.e., intrinsic motivation) or because she perceives the value of doing so in that specific situation, and therefore experience autonomous self-regulation (e.g. I want to go to a party now because, I want to fulfil the personal goal of having fun). Therefore, there is coherence between (i) the *short-term* personal goal of wanting to have fun and going to a party or simply (ii) the behavioural actions associated with going to a party. However, it is unclear whether higher-level coherence exists between *long-term* future identity goals (i.e., I want to be a successful learner), and the decision to go to a party. Based on my conceptual framework, I argue that higher-level self-regulation including identity content (i.e., meaningful commitment), has a more long-term or persistent influence on behavioural decisions than lower-level regulation (i.e., autonomous self-regulation). Said differently, I argue that not all autonomously motivated decisions are necessarily reflective of identity content, and not considering the role of identity regulation in motivation, leads to an incomplete explanation of the long-term stability of people's commitments.

People require basic psychological need support to experience autonomous self-regulation (Deci & Ryan, 2002). In the present study, I question whether South African learners receive enough support of their basic psychological needs, due to their socio-economic circumstances (see section 1.2.1). Nevertheless, it is noticeable from recent South African based SDT studies that South Africans report average to high average levels of need satisfaction (Chen, Van Assche et al., 2015; Roman et al., 2015). Deci and Ryan (2000) said internalisation is not only dependent on need support from others but also "…the extent that the individual has sufficient inner resources to find or construct the necessary nourishment" (p. 229). Deci and Ryan (2000), do not elaborate on what these "inner resources" refer to, and in the present study, I propose that meaningful commitment, as far as offering coherence and structure in life (Human-Vogel & Mahlangu, 2009), help people to construct the necessary nourishment or experience need satisfaction. To be precise, I propose that, learners will find it easier to internalise externally imposed tasks, and therefore experience autonomous motivation, when the outcome thereof relate to their future identity self-descriptions, which in turn will lead to higher levels of basic psychological need satisfaction.

1.4 PURPOSE STATEMENT

More information is needed on, (i) the function of *meaning in SDT* in addition to basic psychological needs and autonomous self-regulation, (ii) how *meaning sustains long-term commitments*, and (iii) how SDT constructs and meaningful commitment contribute to *academic achievement in South African learners*. The purpose of the present study is, firstly to explore whether SDT related constructs (i.e., basic psychological need support and satisfaction, perceived competence, and autonomous self-regulation), predicts academic achievement in a South African high school sample, as have been

demonstrated other samples abroad. Secondly, to establish if meaningful commitment, can compete with autonomous self-regulation in predicting need satisfaction and academic achievement. To accomplish the purpose of the study, I formulated the research questions, along with two hypothesised models that will be discussed in the following sections.

1.5 DELINEATING FACTORS IN THE PRESENT STUDY

I did not include or control for other dispositional or situational variables that may also influence academic achievement, such as aptitude, cognitive functioning, psychological attributes, or socio-economic circumstances, in the present study. These variables were investigated in earlier studies and are well documented (see chapter 2, section 2.2 for an overview). Time and resource constraints prohibited the inclusion of these variables, and I acknowledge the limitations associated with the exclusion thereof. Furthermore, given the exploratory nature of the present study, I only included a particular age and demographic group in my sample, which means that the results will not be transferable to other contexts.

1.6 HYPOTHESES AND RESEARCH QUESTIONS

1.6.1 MODEL 1 – RESEARCH QUESTION AND ACCOMPANYING HYPOTHESES

❖ **Research Question 1**

Do autonomous self-regulation and perceived competence mediate the association between need support and academic achievement?

❖ **Hypotheses**

- H_1: Need support will predict academic achievement.
- H_2: Need support will predict autonomous self-regulation.
- H_3: Autonomous self-regulation will predict perceived competence.
- H_4: Perceived competence will predict academic achievement.
- H_5: The strength of the association between need support and academic achievement will be reduced when accounting for autonomous self-regulation and perceived competence as mediators.

1.6.2 MODEL 2 – RESEARCH QUESTION AND ACCOMPANYING HYPOTHESES

❖ **Research Question 2**

Does need satisfaction mediate the associations that both meaningful commitment and autonomous self-regulation have with academic achievement?

❖ **Hypotheses**

- H_6: Meaningful commitment will predict academic achievement.
- H_7: Need satisfaction will mediate the association between meaningful commitment and academic achievement.
- H_8: Autonomous self-regulation will predict academic achievement.
- H_9: Need satisfaction will mediate the association between autonomous self-regulation and meaningful commitment.
- H_{10}: Meaningful commitment and autonomous self-regulation will be correlated.

❖ **Research Question 3**

Is there a difference in strength in the association between meaningful commitment and academic achievement and autonomous self-regulation and academic achievement?

1.7 CONCEPTUALISED PREDICTOR MODELS

The hypotheses presented in section 1.7 are illustrated in the two conceptual models on this and the following page:

1.7.1 MODEL 1 – CONCEPTUALISED MODEL

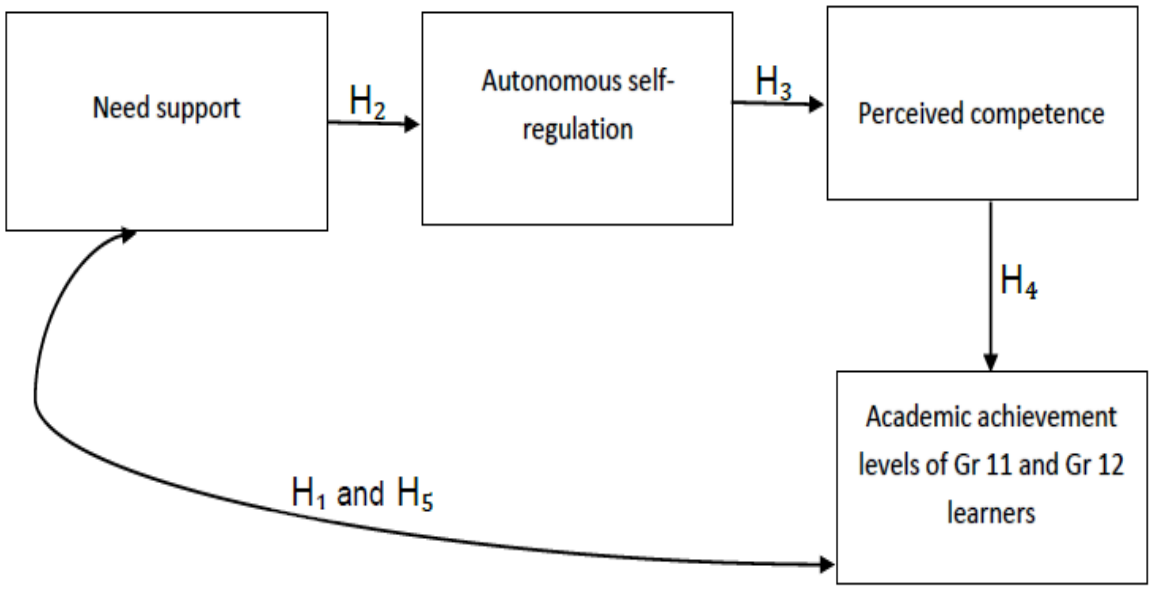

Figure 1.1: Conceptual model 1

1.7.2 MODEL 2 – CONCEPTUALISED MODEL

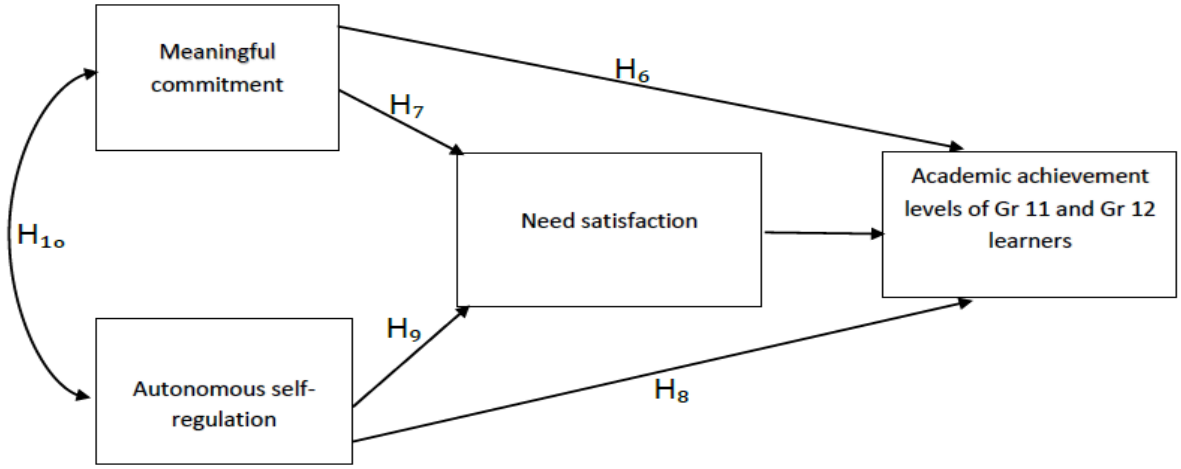

Figure 1.2: Conceptual model 2

1.8 METHODOLOGICAL CONSIDERATIONS

1.8.1 PARADIGMATIC ASSUMPTIONS

The paradigmatic assumptions guiding my research efforts resemble critical realism, a post-positivistic paradigm (Bhaskar, 1978). My ontological assumptions regarding reality, therefore, include the idea that reality is stratified and not wholly understandable (Bisman, 2010). I consequently admit that it is impossible for me to completely understand the present research phenomena, partly because of my human inability to completely observe reality and also because I did not include all variables (e.g. dispositional, situational) that may also influence academic achievement. My epistemological perspectives, include the notion that researcher objectivity, although an important ideal, is limited (Wuisman, 2005). I therefore stayed cognisant of my own perceptions of the research problem and ensured that I interpreted my findings in relation to other existing research findings and theoretical assumptions. Methodologically, I ensured that I included more than one measurement and I consulted more than one theoretical perspective (Bisman, 2010).

1.8.2 RESEARCH APPROACH AND DESIGN

I used a quantitative research approach with an accompanying non-experimental, prospective correlational design to plan and conduct my research activities as well as answer my research questions (Reis & Judd, 2014). I used a correlational design because it allowed me to engage in an exploratory investigation of the research phenomena in an authentic or real-life situation, as well as include several independent variables (Cohen, Manion & Morrison, 2007). The non-experimental nature of the correlational design, however, prohibited me from making inferences regarding causality (Creswell, 2013). The investment of money and time, the potential attrition of participants as well as selection bias are possible limitations of a non-experimental prospective correlational design (Creswell, 2013; Manolio, Bailey-Wilson & Collins, 2005). I restricted data collection to two separate occasions over three months,

and ensured that I included an adequate number of participants in my sample, to proactively deal with the limitations associated with a non-experimental prospective correlational design.

1.87.3 DATA COLLECTION

1.8.3.1 Participants

I utilised a non-probability, purposeful sampling technique (Mertens, 2015) to generate a sample with the following sample parameters:

(i) Gr. 11 and 12 learners attending a high school,
(ii) from the Madibeng school district in the North-West province, South Africa,
(iii) displaying diverse characteristics (e.g. public schools and a private school) and
(iv) varied demographical characteristics (e.g. race and language).

Sample size was an important pre-emptive consideration because it influences decisions about statistical analysis procedures as well as population representativeness (Cohen et al., 2007). In following the recommendations of Kline (2010), I concluded that I would need to generate a minimum sample size of at least 230 participants. The present study included a sample of 392 participants, prior to listwise deletion.

1.8.3.2 Data collection instruments

Table 1.1, below, is a summary of the psychometric properties of all the scales used in the present study. The questionnaire containing the measurements used in the present study can be found in appendix 3.

Table 1.1: A summary of the psychometric properties of measurements used in the present study

Scale	Variable number in questionnaire	Construct operationalised	Sample Question	Alpha Cronbach in earlier investigations
Learning climate questionnaire (Williams & Deci, 1996).	V24 – V38	Perceived basic psychological need support.	"I feel that my teachers accept me."	(Chen & Jang, 2010) – Ω 0.95.
The ***meaningfulness subscale*** of the academic commitment scale (Human-Vogel & Rabe, 2015).	V40 – V47	Meaningful commitment.	"My approach to my academic activities reflects who I am as a person."	(Human-Vogel & Rabe, 2015) – Ω 0.91 for the meaningfulness subscale, in a tertiary educational setting.

Scale	Variable number in questionnaire	Construct operationalised	Sample Question	Alpha Cronbach in earlier investigations
Adapted version of the treatment ***self-regulation questionnaire*** (Ryan & Connell, 1989).	V49 – V60	Autonomous self-regulation.	"Others would get mad at me if I did not participate in academic activities."	(Williams, Freedman & Deci, 1998) – Ω 0.8 – 0.84.
Perceived competence **scale** (Williams & Deci, 1996).	V66 – V69	Perceived competence.	"I feel confident in my ability to participate in academic activities at school."	(Williams et al., 1998) – Ω 0.8.
Adapted version of the ***basic need satisfaction*** scale in relationships (La Guardia, Ryan, Couchman & Deci, 2000)	V71 – V80	Basic psychological need satisfaction.	"I feel free to be who I am."	(La Guardia et al., 2000 - Ω 0.90 - 0.92)

Academic achievement (V82) was measured by calculating the overall average marks of each participant for the first term as given by the participating schools.

A biographical questionnaire containing closed-ended questions included the following aspects:

- Demographic variables *(V1 – V3, V5 – V7 and V9).*
- Learner perceived investment in academic activities *(V4 and V8).*
- Future goal setting *(V10 and V11).*
- Factors potentially influencing academic achievement negatively *(V12 – V18).*
- Support from other individuals to improve academic achievement *(V19 – V23).*

1.8.3.3 Research procedures

I obtained permission from the North-West Department of Education to approach schools and invite them to take part in the study (see appendix 2). I gave six schools an invitation letter (appendix 5) and three schools agreed to participate. The parents of the participants received informed consent letters (appendix 6) and the learners received informed assent letters (appendix 7). I collected data over two phases. The participants completed the questionnaire during the first data collection phase and the participating schools provided me with the academic results of the participants during a second phase of data collection.

1.8.4 DATA ANALYSIS

1.8.4.1 Data capturing and descriptive analysis

Data was captured and analysed according to its descriptive properties by utilising the SPSS program for Windows version 23. Missing data was addressed by listwise deletion (Pigott, 2001) implying that all missing cases were excluded from the dataset. Data was summarised and organised per its descriptive properties, and measures of centrality, variability and distribution were calculated for this purpose (Whitley, 2001). Information about the distributional properties of the sample, as informed by skewness and kurtosis statistics, in turn informed decisions on the use of non-parametric or parametric statistical techniques (Pietersen & Maree, 2007). The internal consistency of all measurements was investigated by the calculation of their Cronbach alphas and the inspection of inter-item correlations (Maree, 2007).

1.8.4.2 Inferential analysis

A Pearson-product correlation, a parametric version of correlational analysis, was executed to determine whether zero-order correlations were present between measured variables, because this is a prerequisite for regression analysis, as part of path analysis (Cohen et al., 2007). In addition, I wanted to find out whether the measured variables displayed collinearity, which would have had a negative impact on path analysis (Pallant, 2001).

A principal component analysis (PCA) was also conducted, to investigate the dimensionality of the meaningful commitment scale and autonomous self-regulation questionnaire. I, therefore, wanted to explore the underlying structure between measured variables (Tinsley & Brown, 2000), to assess if meaningful commitment and autonomous self-regulation represented unique. Oblique (Promax) rotations were used to interpret factor matrixes (Kline, 1994).

The software program Statistical Analysis System 9.3 (SAS 9.3) was utilised to conduct path analysis. Path analysis, an extension of regression analysis and a variant of structural equation modelling (Kline, 2010), allowed me to investigate whether the data corresponded with my hypothesised models (see section 1.8). I decided to use path analysis, because it allowed a smaller sample size than structural equation modelling, and it allowed me to assess combined indirect and direct effects (Schumacker & Lomax, 2012), that would not have been possible with multiple regression analysis. Using path analysis prohibited me from making causality inferences. Moreover, using observed variables and excluding latent variables precluded me from making inferences about measurement error (Raykov & Marcoulides, 2006).

The following steps were followed during path analysis, as recommended by various authors (Holmbeck, 1997; Kline, 2010; Norman & Streiner, 2003):

- It was investigated whether the model was identifiable as informed by the number of observations and parameters or, put differently, whether it could produce statistical results.

- Parameter estimation was calculated through maximum likelihood estimation.
- Model-fit analysis was then established by global-fit and relative model-fit indices.
- The hypothesised models were then modified, if necessary, as informed by theoretical input.
- Direct effects were investigated to show the associations between variables.
- Indirect effects were categorised according to the recommendations of Zhao, Lynch and Chen (2010), after establishing if specific indirect effects were significant, through bootstrapping and confidence intervals as advised by Preacher and Hayes (2008).

1.8.5 QUALITY ASSURANCE METHODS

I based my quality assurance methods on critical multiplism, trustworthiness and analytical generalisation, as informed by my critical realist paradigmatic assumptions (see section 1.9.1 and 3.2) (Bisman, 2010).

Critical multiplism is concerned with the acknowledgement of bias in research together with the notion that any single research method or procedure is limited (Bisman, 2010). I therefore used more than one theoretical standpoint in trying to understand the phenomena, collected data on more than one occasion, and used more than one research measurement to comply with this requirement. *Trustworthiness* in critical realism resembles auditability of data (Bisman, 2010). It was therefore of paramount importance that I ensured thorough documentation of data collection and analysis methods before and during the research process. While trustworthiness may facilitate the external replication of my results, *analytical generalisation* helped me to establish whether within-study analytical replication was warranted (Bisman, 2010). Following critical realism and its assumptions, I acknowledged the fact that I engaged in exploratory research, not knowing the entire nature of the research phenomena. I will therefore contribute to theoretical understanding but not necessarily try to produce universal generalisations (Bisman, 2010).

1.8.6 ETHICAL PROCEDURES

I adhered to ethical considerations in the present study to respect, dignify and protect the participants (De Vos, Strydom, Fouche & Delport, 2002). In a first step, I received approval from the Faculty of Education's Ethics Committee (appendix 1). I also gave the parents of the participants informed consent (appendix 6) and informed assent letters (appendix 7) to the participants themselves. In these letters, I supplied accurate and sufficient information what is expected of participants (Cohen et al., 2007). There was adequate time for participants and their parents to ask questions before and after the study. The voluntary nature of participation as well as the right to withdraw participation at any stage were specified (Terre Blanche, Durheim & Painter, 2006).

I asked participants to disclose their identities, in order to obtain their academic results during the second data collection phase and to link data from the two different data collection phases. The identities of the

participants and the names of participating schools were, however, kept confidential and their identifying information was not shared with any third party nor will it be included in future publications (Whitley, 2001). Participants were not coerced to take part in the present study, nor did they receive any inducement to participate in the research.

1.9 DEFINITIONS OF TERMS

1.9.1 MEANINGFUL COMMITMENT

People choose to *act* for various reasons (e.g. hedonistic reasons, learned responses), but *commit* to behaviours when it is meaningful (Csikszentmihalyi, 1990), or a reflection of their identity. Identity, therefore, fulfils a self-regulatory function (Baumeister et al., 2007), by influencing which goal and behavioural decisions people commit to, based its relevance to identity self-descriptions. In the present study, I therefore conceptualise meaningful commitment as the extent to which learners feel that their academic related behavioural decisions or commitments reflect their identity self-descriptions (Human-Vogel, 2013; Human-Vogel & Rabe, 2015), which in turn help them to experience coherence, significance, and purpose in life. Meaningful commitment is, furthermore, operationalised in the study by the meaningfulness subscale of the academic commitment scale (Human-Vogel & Rabe, 2015).

1.9.2 BASIC PSYCHOLOGICAL NEEDS

Basic psychological needs including autonomy, competence and relatedness are “innate psychological nutriments that are necessary for psychological health and social wellness” (Vansteenkiste et al., 2010, p. 131). The need for *autonomy* is satisfied when people believe that they are the source or originator of their own behaviour. The need for *competence* is related to feeling like one is effective and having opportunities to display effectiveness. Lastly, the need for *relatedness* is associated with feelings of belonging, or feeling that one can care for and be cared for by other individuals (Deci & Ryan, 2000). Educational environments (e.g. parents or teachers) can *support* these needs by helping learners to feel autonomous during academic activities, to feel competent by providing learners with optimal challenges and structure, and creating an emotionally conducive learning environment to enable relatedness (Niemiec & Ryan, 2009). Existing SDT investigations highlight the association between basic psychological need support and positive academic outcomes (e.g. Black & Deci, 2000). I operationalised need support in the present study by the learning climate questionnaire (Williams & Deci, 1996).

Learners in the present study may experience low need fulfilment when their phenomenological experience of *need satisfaction* is less than satisfactory, and need frustration when they experience a complete lack of needs fulfilment (Deci & Ryan, 2000). Lower levels of need satisfaction are associated with poorer academic outcomes (Betoret & Ariga, 2011; Bonneville-Roussy, Vallerand & Bouffard, 2013). I used an adapted version of the basic need satisfaction scale in relationships (La Guardia et al., 2000) to operationalise basic psychological need satisfaction.

1.9.3 AUTONOMOUS SELF-REGULATION AND AUTONOMOUS MOTIVATION

Intrinsic motivation occurs when people engage in activities that are interesting and enjoyable (Deci & Ryan, 2000). Learners, however, must face externally imposed demands in their educational environments (e.g. teachers or curriculum). Basic psychological need support from others help learners to internalise or autonomously self-regulate external demands (Deci & Ryan, 2000). The extent to which externally imposed demands are internalised, exists on continuum of internalisation, with external regulation and integrated regulation representing opposite ends of the continuum (Niemiec & Ryan, 2009).

Vansteenkiste et al. (2010), moreover, differentiate between *autonomous* motivation (including intrinsic, integrated and identified regulation) and *controlled* motivation (including external and introjected regulation). Autonomous motivation includes the volitional regulation of behaviour that is self-endorsed, whilst controlled motivation is the controlled regulation of behaviour as influenced by external contingencies (Vansteenkiste et al., 2010). Autonomous motivation is associated with positive academic outcomes (e.g. Guay, Ratelle, Litalien, 2010). I operationalized the extent to which learners are engaged in autonomous self-regulation and autonomous motivation, by an adapted version of the treatment self-regulation scale in the present study (Ryan & Connell, 1989).

1.9.4 PERCEIVED COMPETENCE

There is a positive association between a learner's perception of being competent in school tasks and academic achievement (Chouinard & Roy, 2010; Williams & Deci, 1996). Perceived competence is conceptualised and operationalised in the present study, following SDT and not social learning theoretical assumptions. Learners experience optimal levels of perceived competence when they feel effective in regulating educational environments and have opportunities to display this effectiveness (Deci & Ryan, 2002). Teachers support perceived competence in classrooms, by offering structure in an autonomous manner (Vansteenkiste et al., 2010). Perceived competence was operationalised in the present study by the perceived competence scale (Williams & Deci, 1996).

1.9.5 ACADEMIC ACHIEVEMENT

Academic achievement was operationalised in the present study by considering the average academic results of participants at the end of the first term, as given by participating schools. The participants' first-term marks consisted of assignments and tests marks achieved in subjects that are part of the South African curriculum.

1.10 POTENTIAL CONTRIBUTION OF THE PRESENT STUDY

In present study, I attempt to make theoretical, methodological, and practical contributions. Due to the exploratory and correlational nature of the present study, I only try to problematise current theory and develop additional hypotheses that can investigated in future studies. More specifically, I hope to

problematise and bring clarity to the role of meaning in SDT, and simultaneously, also generate more hypotheses about the emerging role of meaning in sustaining long-term commitment. As such, the present study can contribute to developing a better understanding of the organising role of meaningful commitment in self-regulation of behaviour.

Methodologically, the present research will contribute to the validation of the learning climate questionnaire, self-regulation questionnaire and perceived competence scale in a South African sample. Additional insight will also be given on the role of meaningfulness as an adequate sole predictor of academic achievement in a high school sample, with actual academic achievement as outcome variable.

Furthermore, the findings from the present study will make a practical contribution by showing if and to what extent, meaningful commitment and self-determination contribute to the academic achievement levels of South African learners. To elaborate, many South African learners underperform academically, despite resource investments (cf. chapter 2, section 2.2). Several SDT theorists have provided evidence based strategies to optimise academic performance, and the findings from the present study could therefore possibly illustrate the importance of teachers receiving training on these evidence-based strategies.

I mention in chapter 2 section 2.2.2, that many South African learners, in addition to underachieving academically, leave the school system before completing Gr 12. As discussed earlier, I propose that meaningful commitment leads to long-term academic goal and behavioural commitment. The findings from the present study, could therefore help teachers and policy makers, to understand whether the implementation of strategies to increase meaningful commitment makes a difference to academic performance, while future studies could investigate the association between learner retention and meaningful commitment.

1.11 CHAPTER OUTLINE

- **CHAPTER 1**

In chapter 1 I offer a brief overview of the contextual and theoretical background of the present study. I discuss the problem statement and rationale, to highlight the purpose of the present study. In addition, I give a brief discussion of the methodological considerations of the present study and present a conceptual clarification of all measured constructs.

- **CHAPTER 2**

Chapter 2 contains an in-depth literature review of the contextual background of the study (academic achievement levels of learners in South Africa), as well as a literature review of meaningful commitment and SDT. I also present a discussion and illustration of my conceptual framework.

- **CHAPTER 3**

In chapter 3 I give an elaborated discussion of the methodological considerations of the present study. I include a discussion of the research design, data collection procedures and the operationalisation of constructs through chosen measurements. I also discuss how the data was analysed, including descriptive and inferential statistical procedures.

- **CHAPTER 4**

The results of the data analysis phase are presented in chapter 4.

- **CHAPTER 5**

In this chapter, I provide a summary of the research findings and discuss their relevance to the initial research questions and hypotheses. The study's results are further explored in relation to existing literature. The limitations of the study and recommendations for future investigations serve as a conclusion.

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Chapter 2
Literature Review

2.1 INTRODUCTION

In this chapter, I first present a literature review on the contextual background of the present study, including an overview of academic performance levels of South African learners, reasons for academic underachievement and why some learners are academically resilient. I then give an overview of motivational theories as well as SDT and meaningful commitment theory. Lastly, I discuss my conceptual framework, in which I try to explain how meaningful commitment and SDT constructs relate to each other within a self-regulatory context, to facilitate academic achievement.

2.2 ACADEMIC ACHIEVEMENT IN SOUTH AFRICA

2.2.1 THE IMPORTANCE OF ACADEMIC ACHIEVEMENT FOR HIGH SCHOOL LEARNERS IN SOUTH AFRICA

South Africa's history of segregation of white and black citizens imposed by the apartheid regime had, and still has, far-reaching implications for economic, social, and educational prosperity in South Africa (Barbarin & Richter, 2001; Clark & Worger, 2013). In the education sector, specifically, disproportional distribution of resources during apartheid effected the quality of education delivery to black learners. For instance, the black educational sector received a tenth of the per capita government spending that was given to white schools in the 1970s (Byrnes, 1996). Black learners were furthermore forced to follow a different curriculum to white learners, and the Bantu Education Act of 1953 prohibited their teachers from commenting on educational practices imposed by the apartheid government (Christie & Collins, 1982).

One could argue that a lack of equal educational for all citizens, had a negative impact on South Africa, for authors have shown a positive association between the educational level of citizens and social and economic prosperity of a country (Gradstein & Justman, 2002; Lutz, Cuaresma & Sanderson, 2008). To elaborate, with regards to economic prosperity, literature shows that citizen educational level, are associated with gross domestic product (GDP), economic growth (Barro, 1991), technological advancement and international competitiveness (Levy & Murnane, 2004). On a social level, educational attainment is associated with social cohesion and civic values (Gradstein & Justman, 2002), physical well-being (Groot & van den Brink, 2004) and lower levels of crime or incarceration (Lochner & Moretti, 2004).

Segregation and sanctions by international governments against South Africa, however, ended in the 1990s, which enabled global economic participation and necessitated the development of scares skills. Adequate education provision became essential, not only to allow for economic and social advancement of the country, but also for all people and their children who have been discriminated against in the past to benefit from new opportunities.

South Africa is, however, presently a developing country, and the South African government prioritised the development of scarce-skilled workers in their Millennium Development Goals (Republic of South Africa, 2010). The current South African government's commitment to education is evident from how much they spend on education. The South African government, for instance, allocated R203 billion (approximately[2] $14.7 billion, €14.05 billion) in their 2015 budget for basic education (Republic of South Africa, 2014). More learners consequently have access to education in South Africa than ever before. Modisaotsile (2012), for example, reports that 98% of children in South Africa had access to basic education in 2012. The Minister of Education, moreover, implemented new regulations for minimum uniform norms and standards for public schools in the Schools Act, which indicates that all schools should have access to basic infrastructure including electricity and sanitation (Department of Education, 2009).

2.2.2 ACADEMIC PERFORMANCE BY SOUTH AFRICAN LEARNERS

Several local and international investigations, however, show that South African learners underachieve academically in *mathematics*, *science* and *language* subjects. Locally, the 2014 Annual National Assessment (ANAS) steered by the Department of Education, including 7.3 million learners, showed that Gr. 9 learners achieved an average of 11% in *mathematics* and 48% in *home language* (Department of Basic Education, 2014). Internationally, the Trends in International Mathematics and Science Study (TIMSS), completed in 2011 including 42 countries, found that South African academic achievement in *Mathematics* and *Science* was comparable to the six poorest performing countries (Human Sciences Research Counsel, 2012). Finding from the TIMSS study furthermore indicated that 76% of Gr. 9 learners in South Africa had not yet acquired a basic understanding of *mathematical* concepts such as whole numbers and decimals (Spaull, 2013). The SACMEQ III study by the Southern and East African Consortium for Monitoring Educational Quality, moreover, investigated academic achievement levels of ten African countries and included a sample of 9 083 South African learners. This study reported that 27% of Gr. 6 learners were *illiterate*, because they were not able understand a simple reading passage (Spaull, 2013). The PIRLS (Progress in International Reading Literacy Study) in 2011, furthermore, showed that 43% of South African fifth grade learners had not yet acquired basic skills needed for *reading* at an international fourth grade level (Howie, van Staden, Tshele, Dowse & Zimmerman, 2012).

Academic underachievement by South African learners in younger grades, seem to influence their eventual academic achievement levels later in the National Senior Certificate in Education examination (NSCE) (i.e., the national Gr. 12 examination). Results released by the Department of Basic Education, show an increase of 13.2% in the amount of Gr. 12 learners who were able to pass the NSCE in 2014 in comparison to 2008, but that only 28.3% received high enough marks to receive university exemption (Department of Basic Education, 2014). In addition, only 53.5% of the Gr. 12 candidates in 2014 could obtain more than 30% for Mathematics (Department of Basic Education, 2014). Many high school learners also leave the school system. The Southern Africa Labour and Development Research Unit,

[2] Based on exchange rates on 1 January 2017: 1 ZAR = 13.7 USD and 1 ZAR = 14.4 EUR (XE currency converter, 2017).

for instance, reported an attrition rate of 15% in their Gr. 12 learner sample (Branson et al., 2013). Spaull (2013) states that for every 100 learners who were in Gr. 1 in 1999, 50 had left the school system (mostly occurring in Gr. 10–Gr. 12), 40 passed the NSCE in 2011 and only 12 received University Exemption.

In the following section, I give a concise overview of some of the factors that influence academic achievement levels by South African learners, as have been reported by researchers in the past. It is important to note, that I only give a brief overview of these factors, with the intention of giving background information for the present study. The purpose of present study is, however, to investigate the association between meaningful commitment and SDT. Additional information on each factor, as well as how it influences academic achievement levels, can however be found by directly consulting each study referred to in this section.

2.2.3 FACTORS INFLUENCING ACADEMIC ACHIEVEMENT IN SOUTH AFRICA

2.2.3.1 *Broader systemic influences on academic achievement in South Africa*

Prior investigations highlight several potential systemic or context-specific influences on academic achievement in South Africa. Fleisch (2008) and Sirin (2005) for instance, report that the socio-economic status of school communities or home environments have an impact on academic achievement. Van den Berg (2008) reports a bimodal tendency in the achievement levels of learners in the SAMEC II sample, where most learners achieved either lower-end or higher-end scores. Spaull (2012), furthermore, proposes that the socio-economic status of learners have an effect on these bimodal tendencies in academic achievement. Only 10% of the South African learners who took part in the TIMSS study had parents with a tertiary qualification, and only 30% of the participants' parents had no more than primary school education (Reddy, 2006). In other words, South Africa's apartheid legacy has arguably, left discrepancies in resource distribution that still influence the academic achievement levels of learners today.

Some additional systemic influences in South Africa on learner academic functioning noted in prior investigations include: the influence of *violence within the school community* (Zulu, Urbani, Van der Merwe & Van der Walt, 2004); the influence of *teenage pregnancy* (Branson et al., 2013; Grant & Hallman, 2008); *learners caring for other individuals who have been diagnosed with HIV* (Cluver et al., 2011); *the level of parental involvement in education* (Singh, Mbokodi & Msila, 2004); *residential and school mobility* (Ginsburg, Richter, Fleisch & Norris, 2011); *household and parental income* (Anderson, Case & Lam, 2001); *the death of a parent* (Case & Ardington, 2006); and *having access to learning material at home* (Spaull, 2012).

2.2.3.2 School-related factors

Unequal distribution of resources in schools still ensues. The 2011 National Education Infrastructure Management Report showed that that 79% of South African schools in 2011 did not have libraries and that 85% did not have access to laboratories. Even more alarming is that 3544 schools did not have

access to electricity and 2 402 schools did not have access to water (Department of Basic Education, 2011). Spaull (2011) reported on the SAMEQ III results, and reported that 36.8% of the poorest learners (lowest 20% percentile) in the South Africa sample did not have access to reading textbooks. The effect of the socio-economic status of schools on academic achievement levels by learners is shown by Visser, Juan and Feza (2015), who mention that South African learners of a higher socio-economic status perform poorly in under-resourced schools, while poor learners' marks improve when they attend resourced schools.

Other school-related factors that may be associated with poorer scholastic functioning by South African learners are: the *lack of subject knowledge of teachers*, with teachers included in the small sample of Mabogoane and Pereira (2008) obtaining an average of 32.5% in a Gr. 4–7 mathematics test; *ineffective time management practices* by teachers, when they only spend half of their working hours teaching (Taylor, 2008); *teacher absenteeism*, with between 10–12% of all educators being absent on any one day (Prinsloo & Reddy, 2012); *teaching strategies* (Taylor, 2008); *school management practices* (Bush et al., 2009); *ineffective assessment practices* (Reyneke, Meyer & Nel, 2010); *teacher job satisfaction* (Iwu, Gwija, Benedict & Tengeh, 2013); *school violence* (Burton & Leoschut, 2012); and *curriculum change* (Engelbrecht & Harding, 2008).

2.2.3.3 Learner factors

Taylor and Coetzee (2013) argue that language of assessment may have a negative effect on academic achievement. They say that all Gr. 12 learners are expected to write the NSCE in either Afrikaans or English, but only 23% of all South African citizens speak these languages as their first language (Statistics South Africa, 2012; Taylor & Coetzee, 2013). The South African government does not prescribe which of the 11 official languages should be used in schools. Most learners in South Africa, however, are taught in English from Gr. 1 onwards because the teacher displays a preference for teaching in that language (Nel & MÜller, 2010), or even perhaps due to resource constraints or parental demand. Taylor and Coetzee (2013) investigated longitudinal data forming part of the Annual Survey of Schools in South Africa, and report that learners who received education in their first language during their first three grades displayed higher English proficiency in later grades. Many South African learners therefore have to follow a pattern of language immersion (Wayne & Collier, 2002), where they receive education in English from a very young age, which may influence their academic achievement levels.

Additional learner-related factors that may influence learner academic functioning include: *chronic diseases* (e.g. HIV) (Fleisch, 2008); *lack of self-knowledge or learning goals* (Monteith, 1998); *motivation and interest in subjects* (Makgato & Mji, 2006); *the prevalence of special needs* (Adnam, 2010); *severe disability* (Unicef, 2012); *mental disability* (Kleintjies, Flisher, Fick, Railoun, Lund, Molteno & Robertson, 2006); and *teachers' feelings of inadequacy in implementing inclusive education* (Ntombela, 2011).

2.3 ACADEMIC RESILIENCE

Many South African learners, however, achieve satisfactory academic results, even though they face adversity. For instance, the learner who obtained the third-highest academic result in Physical Science during the NSCE in 2013 did so at an under-resourced school (eNCA, 2014). One could simply argue that learners who excel in impoverished conditions, are more intellectually gifted than others. Recent findings, however, seems to suggest that other psychological factors, apart from intellectual functioning also contribute to academic achievement. Duckworth and Seligman (2005), for instance, conducted a longitudinal study with 168 learners found that self-discipline accounted for twice as much variance as IQ in predicting academic achievement. In a similar vein, Qualter, Gardner, Pope, Hutchinson and Whiteley (2012) also conducted a longitudinal study with 413 learners and found that emotional intelligence moderates the association between cognitive ability and academic achievement.

Intellectual capacity is therefore, only one component of academic achievement, which makes one question what other factors could also potentially help learners to excel academically. People are resilient when they are able to flourish in challenging circumstances (Masten, 2012). Academic resilience, specifically, refers to "a student's ability to deal effectively with academic setbacks, stress and study pressures" (Martin, 2002, p. 35), and includes protective factors that reduce the impact of negative events, the avoidance problematic pathways and promotion of positive and successful pathways to academic achievement (Martin, 2002). International studies show that attributes such as feelings of self-efficacy, control, planning, low anxiety, taking an independent role in academic functioning, persistence and experiencing academic success are associated with academic resilience (Capella & Weinstein, 2001; Martin & Marsh, 2006; Masten, 2012). Locally, findings by Dass-Brailsford (2005) and Phasa (2010) show that academically resilient South African learners are more goal-orientated, experience agency, are future orientated and experience self-determination.

Academically resilient learners are also more motivated (Alva, 1991, Martin, 2002), which in turn help them to achieve improved academic results (e.g. Amrai, Motlagh, Zalani, Parhon, 2011; Emmanuel, Adom, Josephine, Solomon, 2014). It is therefore concerning that some authors argue that South African learners display lower levels of motivation (Makgato & Mji, 2006; Masita, 2006). Thus, it seems imperative to understand what motivates South African learners and how to help them feel more motivated, to help them achieve academic success and display resilience.

2.4 MOTIVATION

2.4.1 A BRIEF OVERVIEW OF MOTIVATIONAL THEORIES

The word "motivation" is derived from the Latin verb "*movere*" which means movement (Dörnyei & Ushioda, 2011). Theorists in the past, have utilised motivational theories in different disciplines to understand why people act the way they do, or what "moves" them. Historically, most theorists focused on how instincts, drives (e.g. Freud, 1923), and reinforcements (Skinner, 1974) influenced motivation. Motivational theories in later years, emphasised the importance of human agency for motivation (Steers,

Mowday & Shapiro, 2004). In sum, a review of existing motivational literature indicates that motivation impact the direction and magnitude of behaviour by influencing (i) which goals people select, (ii) whether they persist in goal pursuits or not and (iii) the amount of effort they invest in goal pursuits (Brophy, 2008; Dörnyei & Ushioda, 2014; Renninger & Hidi, 2016). For parsimonious reasons, I will now discuss some motivational theories by differentiating between content and process theories.

Content motivational theories, also referred to as needs theories, explain *what* motivates people to engage in behaviour (Steers et al., 2004). Maslow (1954) originally proposed a *needs hierarchy theory*, in which he argues that people have several needs (i.e., physiological, safety and security, belongingness, and esteem) that they must fulfil to reach a level of self-actualisation. Later, Alderfer (1969) developed the *ERG* (existence, relatedness, and growth) motivational theory, in which he proposes that human needs as put forth by Maslow (1954) relate to three basic needs (i.e., existence, relatedness, and growth), and that the satisfaction of existence and relatedness needs leads to self-actualisation. McClelland's (1961) created the *three needs approach* (sometimes referred to as the motive dispositional theory) in which it is argued that all people have a need for affiliation, achievement, and autonomy. These needs are not hierarchical in nature, and people experience higher levels of motivation when receiving feedback from other significant individuals in their lives (McClelland, 1961).

Process motivational theories according to Steers et al. (2004) explain *why* and *how* motivation takes place, by a person-in-context. *Expectancy-valence theory* (Vroom, 1964) state that people pursue goals when they believe that (i) they will be successful, (ii) they will receive a reward and (iii) the reward is satisfactory. *Equity Theory* (Adams, 1969) moreover, is based on the assumption that people will feel more motivated when they feel that their rewards are just and fair in comparison to other individuals. Locke (1968) presented *goal theory* which, in short, dictate that people feel more motivated when their goals are clear and challenging and when they receive performance feedback.

2.4.2 A BRIEF OVERVIEW OF MOTIVATIONAL THEORIES IN THE ACADEMIC DOMAIN

Educational theorists use motivational theories to understand why learners choose to engage with, and persist in academic activities, and why some learners achieve better results than other (Meece, Anderman & Anderman, 2006). Pintrich (2003) offers a helpful summary of important motivational theories in educational contexts. Table 2.1 on the following page, gives an overview of academic motivation theoretical constructs, based on the work Pintrich (2003) and others.

Table 2.1 Overview of academic motivation literature

Theoretical construct, as proposed by Pintrich (2003)	**Main motivational theories involved**	**Proposed influence on academic motivation**
*"**Self-efficacy and competency beliefs** motivate students" p. 671*	▪ ***Social cognitive theory*** (Bandura, 1989). ▪ ***Social learning theory*** (Pintrich & Schunck, 2002).	▪ Learners who feel **competent** and able to complete tasks: o feel **more motivated** (Schunk, 1995), o **persist** more in tasks (Schunk, 2001), o and **achieve academically** (Valentine, DuBois, & Cooper, 2004)
	▪ ***SDT*** (Deci & Ryan, 2000).	▪ Experiences of **competence need satisfaction** during tasks lead to increased levels of motivation (Black & Deci, 2000).
*"**Goals** motivate and direct students" p. 675*	▪ ***Achievement goal orientation*** (Dweck & Elliot, 1983; Elliot, Murayama & Pekrun, 2011).	▪ Learners display positive academic outcomes when: o They focus on **mastery goals** (mastering learning content) (Meece et al., 2006), o They display a **performance approach orientation** (showing competence) (Elliot, McGregor & Gable, 1999) and **not a performance avoidance approach** (avoiding opportunities to show competence) (Anderman & Patrick, 2012), o They have multiple goal orientations in academic situations, but specifically endorse a **combination of mastery and performance** goals (Harackiewicz, Barron, Tauer & Elliot, 2002), o Based on a 3 x 2 model of goal orientation (Elliot et al., 2011), when learners adopt **self-based and task-based goals** (David, 2014).
	▪ ***SDT*** (Deci & Ryan, 2000).	▪ Vansteenkiste et al. (2010) state that learning tasks associated with **intrinsic** rather than **extrinsic** goals are associated with: o deeper learning approaches, increased achievement, and persistence.
*"Higher levels of **value** motivate students" p .674*	▪ ***Expectancy value theory*** (Eccles & Wigfield, 1995).	▪ Learners' level of academic motivation is influenced by how they **value expected academic outcomes** (Wigfield, 1994) ▪ Learners tend to display better academic outcomes when: o Learners perceive academic "task(s) as central to their own sense of themselves (i.e., their **core social and personal identities**), because such tasks provide the opportunity for the individual to express or confirm important aspects of the self" (Eccles, 2005, p. 109), o They expect that they will be successful in their endeavours (**attainment value**) (Eccles & Wigfield, 2002), o They feel that an academic task has high **utility value** (Harackiewicz, Rozek, Hulleman & Hyde, 2012).

		○ Learners perceive lower levels of **psychological cost** for academic behaviours (Battle & Wigfield, 2003).
	▪ ***Meaningful commitment*** (Human-Vogel & Rabe, 2015).	▪ Students display improved academic outcomes, when they perceive their academic activities as being **reflective of the self or identity** (Human-Vogel & Rabe, 2015).
*"Higher levels of **interest and intrinsic motivation,** motivate students" p. 673*	▪ ***Interest theory*** (e.g. Krapp, 1999).	▪ Higher levels of **personal** (a person's dispositional tendency to enjoy specific activities) and **situational** interest (how interesting a specific task is) is associated with increased academic achievement (Schiefele, Krapp, & Winteler, 1992).
	▪ ***SDT*** (Deci & Ryan, 2000).	▪ Learners who experience intrinsic motivation (activities perceived to be inherently interesting and pleasurable) display higher levels of academic engagement (Skinner & Chi, 2012).
*"Adaptive **attributions and control beliefs** motivate students" p. 672*	▪ ***Attribution theory*** (Weiner, 1986).	▪ According to Weiner (1992): ○ Learners who attribute academic success to **stable features** (e.g. aptitude) tend to expect success in future, ○ **Internal locus of control attributions** (feeling like academic success is because of my own doing and hence I am in control of it) leads to positive affect (e.g. self-efficacy), which arguably enhances motivation.
	▪ ***Self-theory approach*** (Dweck & Leggett, 1988).	▪ Learners have implicit theories regarding their abilities: **entity theories** (my abilities are fixed and unchangeable) and **incremental theories** (my abilities are malleable and can change over time) (Blackwell, Trzesniewski & Dweck, 2007). ▪ Dweck and Molden (2005) state that learners who hold incremental theories tend to display higher levels of motivation by: ○ Setting **stronger learning goals** (e.g. it is more important to learn in class than to impress other people), ○ Having **improved effort beliefs** (e.g. if I invest effort in a task then I will be successful), ○ Obtaining **higher grades.**
	▪ ***SDT*** (Deci & Ryan, 2000)	▪ Learners can experience **autonomous or controlled motivation** (Deci & Ryan, 2000). ▪ **Autonomous** forms of motivation is however not only related to **persistence** (Vallerand, Fortier, Guay, 1997) in academic tasks but also improved **psychological well-being** (Niemiec, Lynch, Vansteenkiste, Bernstein, Deci & Ryan, 2006).

2.5 ACADEMIC MOTIVATION IN SOUTH AFRICA

My review of motivational theories in general (section 2.4.1) and academic motivation literature specifically (summarised in table 2.1), helped me to notice several important aspects that need to be taken into consideration when investigating academic motivation. This helped me to decide which constructs I should include in the present study.

Firstly, there is an association between motivation, academic resilience, and academic achievement (cf. section 2.3). It is therefore important for learners that experience resource constraints to feel motivated, and for researchers to explore what motivate South African learners. *Secondly*, people's motivational levels are influenced by an interaction between environmental factors and personal attributes or needs. I noticed that it is particularly important for learners feel that their competency needs are satisfied, to achieve academic success. *Thirdly*, learners seem to experience higher levels of motivation when they experience outcomes as useful, interesting, and personally meaningful. I concur with other authors who propose that people are (i) active agents in their lives, (ii) that people decide themselves which outcomes they value and (iii) that people create their own goals. As mentioned in section 2.3, academically resilient South African learners realise the importance of academic achievement for improved future outcomes and adolescents, specifically, are engaged in identity development (see section 2.7.2). It therefore seems important that South African learners understand how present academic engagement are related to future identity outcomes. In the present study, I utilise meaningful commitment (Human-Vogel & Rabe, 2015) to operationalise the extent to which learners feel that their academic tasks are reflective of their identity and future identity goals.

Lastly, one could argue that South African learners, like most other learners, do not necessarily experience academic activities as interesting. It is clear from table 2.1, that SDT plays an important role in explaining how extrinsically imposed tasks may be autonomously motivated. Also, it appears that learners experience academic motivation regardless of whether they feel forced to engage in an activity or want to do it out of their own free will. However, the type of motivation experienced by learners do make a difference, for learners display improved psychological well-being and persistence when they feel volitional during academic activities. Indeed, as noted before (cf. section 2.7.2), South African learners who are self-determined display higher levels of academic resilience. In the present study, I therefore, utilise constructs associated with SDT (Deci & Ryan, 2000) to investigate the extent to which South African learners experience self-determination.

2.6 SELF-DETERMINATION THEORY

2.6.1 AN INTRODUCTION

SDT is a macro-theory on motivation that includes five mini-theories as shown in figure 2.1 on the following page (Deci & Ryan, 2000; Vansteenkiste et al., 2010). SDT, in essence, offers a comprehensive explanation of how goal content differences (i.e., intrinsic and extrinsic goals), type of motivation (i.e., autonomous or controlled) as well as basic psychological need satisfaction influence

achievement and psychological well-being outcomes (Deci & Ryan, 2000). Researchers have applied and investigated SDT in several domains including, the *career* (e.g. Van den Broeck, Vansteenkiste & De Witte, 2008), *health* (e.g. Ryan, Patrick, Deci & Williams, 2008), *sport* (e.g. Teixeira, Carraça, Markland, Silva & Ryan, 2012), *psychotherapeutic* (e.g. Ryan, Lynch, Vansteenkiste & Deci, 2011) and *educational* (e.g. Niemiec & Ryan, 2009) domains.

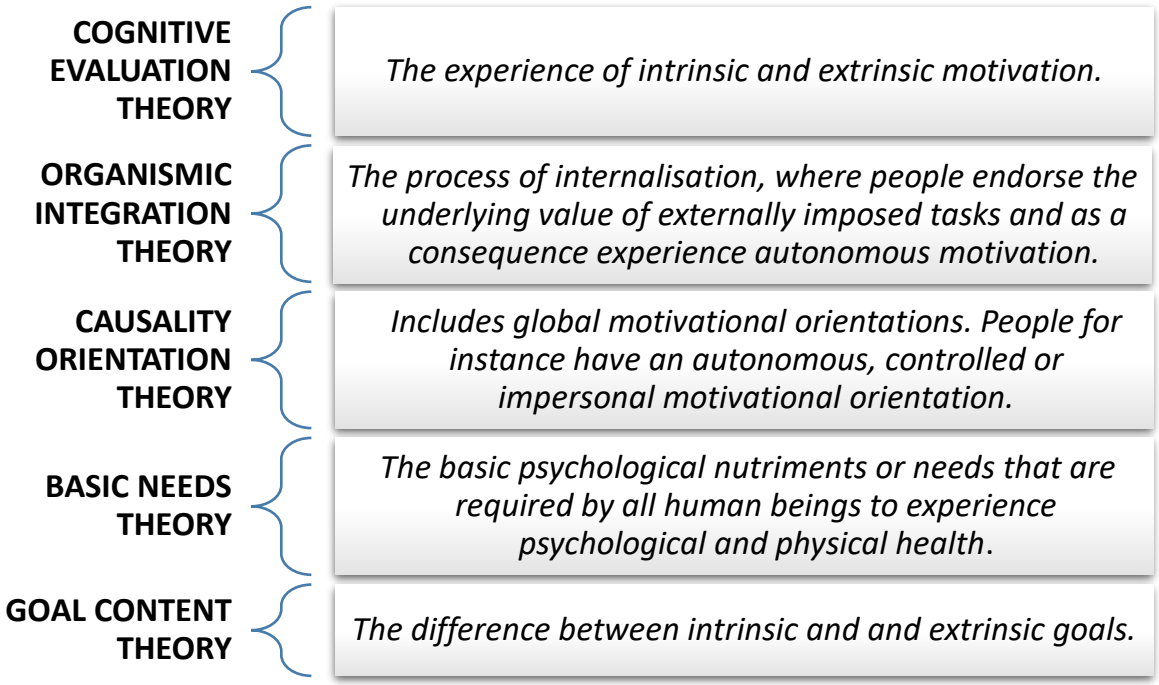

Figure 2.1 Mini theories of SDT

2.6.2 BASIC PSYCHOLOGICAL NEEDS

Deci and Ryan (2000) define basic psychological needs as "innate psychological nutriments that are essential for ongoing psychological growth, integrity, and well-being" (p. 229). People, therefore, require basic psychological needs for optimal psychological functioning like plants need sunlight, water and soil (Deci & Ryan, 2000). Basic psychological needs are furthermore innately part of human nature, meaning that need satisfaction is: (i) important throughout life, (ii) not necessarily dependent on conscious processing and (iii) is universally important regardless of age, culture, or gender (Vansteenkiste et al., 2010). These needs, include *autonomy*, *competence,* and *relatedness* (Deci & Ryan, 2000; Sheldon et al., 2001). The need for *autonomy* is satisfied when individuals feel that they are the causal agent or have a say over their own behavioural decisions. The need for *competence* relates to feeling effective in regulating environments and having opportunities to display effectiveness. *Relatedness* is the need to interact socially, feel connected to and care for other individuals (Deci & Ryan, 2002).

Social or educational environments can be need-supportive, need-depriving or need-thwarting (Deci & Ryan, 2002). Teachers or parents may therefore be indifferent, opposed to or actively support basic psychological need satisfaction (Deci & Ryan, 2000). Autonomy supportive teachers, actively help learners to experience autonomy, by giving them the opportunity to feel like they have a say over what they want or need to do in academic environments, and by limiting assessment-related pressures (Niemiec & Ryan, 2009; Vansteenkiste et al., 2010). Teachers are competence supportive when they provide structure, so that learners know what is expected of them (Grolnick & Ryan, 1989), when they give learners optimal challenges and effectance feedback (Niemiec & Ryan, 2009). Relatedness supportive learning environments are characteristically warm and responsive (Vansteenkiste et al., 2010). A review of literature, furthermore, indicates that learners who experience their educational environment as need supportive tend to experience improved well-being (Niemiec et al., 2006), select harmonious passions and persist in musical education (Bonneville-Roussy et al., 2013), experience increased levels of motivation in PE classes (Leptokaridou, Vlachopoulos & Papaioannou, 2015), display interest in academic activities (Tsai, Kunter, Lüdtke, Trautwein & Ryan, 2008) and report lower levels of self-perceived bullying (Roth, Kanat-Maymon & Bibi, 2011).

SDT theorists also refer to an organismic dialect, meaning that people are growth-orientated beings with a natural inclination to obtain a unified sense of self in social contexts (Deci & Ryan, 2000). It is, therefore, part of the "…adaptive design of the human organism…" to engage in activities that lead to need satisfaction (Deci & Ryan, 2000, p. 229). Individuals, however, do not engage in behaviours with the intention to satisfy basic needs and reduce drives as proposed in drive theory, they experience basic psychological need satisfaction when participating in interesting activities (Deci & Ryan, 2000). A learner who, for instance, enjoys arts and crafts projects and completes a project in her free time does not necessarily do so to fulfil basic psychological needs. However, the experience of autonomy and competence when taking part in this self-perceived interesting activity increases the enjoyment thereof.

SDT theorists, moreover, maintain that all three needs should be satisfied in a balanced way (i.e., all three needs equally) for people to experience psychological well-being (Sheldon & Niemiec, 2006). Individuals experience low need fulfilment when they feel that their level of need satisfaction is less than acceptable, and need frustration when they experience a complete lack of need fulfilment (Vansteenkiste & Ryan, 2013). Need frustration, particularly, is associated with psychopathological outcomes due to compensatory behaviours or need substitution (Bartholomew, Ntoumanis, Ryan, Bosch, & Thøgersen-Ntoumani, 2011). A learner who for instance experiences a persistent and complete lack of relatedness need support from her parents and consequently experiences need frustration, decides to succumb to peer pressure and use illicit substances with other people to feel accepted (i.e., need substitute). Taking part in substance abuse, may help the learner to feel acceptable and experience relatedness in that moment, but could potentially lead to other unfortunate outcomes. Furthermore, persistent substance abuse could also result in conflict between her and her parents, increasing feelings of relatedness need frustration.

Literature indicates that basic psychological need satisfaction leads to improved educational outcomes, such as: displaying a deeper approach to learning (Betoret & Atiga, 2011), experiencing higher levels of school adjustment (Ratelle & Duchesne, 2014), reporting higher levels of school satisfaction (Tian, Chen & Heubner, 2014) and teacher approval (Filak & Sheldon, 2003) and lower levels of academic dishonesty (Kanat-Maymon, Benjamin, Stavsky, Shoshani & Roth, 2015).

An extensive literature search, however, showed that there are no existing SDT investigation using a South African sample, that have specifically measured the extent to which learners feel that their basic psychological needs are supported in academic contexts. Several authors, however, reported average levels of basic psychological need satisfaction in a young adult sample (Chen, Van Assche et al., 2015, study 1) and high school sample (Roman et al., 2015), while Thekiso, Botha, Wissing and Kruger (2013) reported lower levels of need satisfaction in an older sample. Roman (2011) in addition reported that the grade 11 learners in her sample, reported higher levels of maternal autonomy support.

2.6.3 PERCEIVED COMPETENCE

It was clear from my review of motivational literature (cf. section 2.4), that perceived competence is an important aspect of academic motivation. SDT theorists conceptualise and operationalise perceived competence as reflecting innate competence need satisfaction during activities (Deci & Ryan, 2000). Deci and Ryan (2000) argue that the conceptualisation of perceived competence in SDT differs to that of self-efficacy (Bandura, 1989), as proposed by social learning theorists (Pintrich & Schunck, 2002) in three important ways. *Firstly,* SDT theorists propose, that perceived competence in an innate need which is not as contingent on secondary reinforcement (e.g. teachers or prior academic results) as self-efficacy. *Secondly*, social learning theorists do not consider the effect of perceived autonomy on self-efficacy beliefs, implying that people are primarily driven by incentives in social learning theory. *Thirdly,* self-efficacy theorists do not consider how different types of efficacy goals impact psychological well-being. SDT theorists conversely, propose that goal content differences have an impact on psychological well-being (cf. section 2.6.5)

As mentioned before, teachers support perceived competence in classrooms by giving structure (Vansteenkiste et al., 2010). Teachers create structure by giving unambiguous instructions before a lesson, offering to help learners during lessons and providing learners with positive and constructive feedback afterwards (Reeve, 2006). Both autonomy support and structure is important for optimal learning to occur (Reeve, 2006; Vansteenkiste et al., 2010). Differently said, it is important that teachers provide learners with clear guidance, but also give them a rationale for an activity and value their input. Jang, Reeve and Deci (2010), for instance, found that both autonomy support and structure predicted student engagement and Sierens, Vansteenkiste, Goossens, Soenens and Dochy (2009) reported that structure was more associated with self-regulated learning when learners perceived their teachers as being autonomy supportive. Vansteenkiste et al. (2012) furthermore reported that students who felt that

their teachers did not provide them with enough autonomy support and structure (giving learners vague expectations), reported deviant and aggressive behaviours.

Perceived competence also seems to be important for school-related well-being. Tian et al. (2014) reported that, perceived competence was the most significant predictor of school-related well-being (i.e., school satisfaction and positive affect) amongst of all three basic psychological needs. Mouratidis, Vansteenkiste, Michou and Lens (2013) indicated that certain aspects of structure led to competence need satisfaction in their sample, which in turn led to self-regulated learning and positive affect. Perceived competence is also an important part of academic achievement. Miserando (1996), for instance, found that the autonomous self-regulation and perceived competence levels of third- and fourth-grade learners predicted academic achievement, even when controlling for earlier academic results. Olusola (2013) and Yarahmadi (2011) report that perceived competence predicted self-reported academic achievement.

2.6.4 GOAL CONTENT

Kasser and Ryan (1996) argued that people pursue *intrinsic* (e.g. personal growth, close relationships, community contribution) or *extrinsic* goals (e.g. money and fame). SDT theorists often also refer to these goals as aspirations or long-term life goals. Grouzet et al. (2005) offered empirical support for the universal nature of goal types, by showing that the goals of people from 15 countries, could be classified as being either intrinsic or extrinsic. Intrinsic goals are furthermore usually first order goals, meaning that they are not reducible to other secondary goals (Ryan, Huta & Deci, 2009). Vansteenkiste et al. (2010), also, argue that intrinsic goal pursuit represents a third organismic growth tendency (together with intrinsic motivation and internalisation), because people are naturally inclined to pursue intrinsic goals. People, moreover, who receive basic psychological need support are more likely to pursue intrinsic goals (e.g. Lekes, Gingras, Philippe, Koestner & Fang, 2010) as do the pursuit of intrinsic goals, allow for higher levels of basic psychological need satisfaction (Deci & Ryan, 2008) and psychological well-being (e.g. Kasser et al., 2014).

It is important to note that intrinsic and extrinsic goals do not necessarily share a direct association with intrinsic and extrinsic motivation (cf. section 2.6.5). People may therefore pursue intrinsic aspirations for controlled reasons (e.g. I want to experience personal growth in life so that other people can describe me as a wise person) or extrinsic aspirations for autonomous reasons (e.g. I want to make a lot of money, because it is important to me and I can identify with the importance of having a lot of money) (Vansteenkiste et al., 2010). Furthermore, Sheldon, Ryan, Deci and Kasser (2004) found that motivation (i.e., autonomous vs. controlled) and goal content (i.e., intrinsic vs. extrinsic) had significant, unique, and independent influences on well-being.

It is indicated in literature that learners benefit more from intrinsic than extrinsic goal pursuits. Vansteenkiste, Simons, Lens, Soenens, and Matos (2005), for example, reported that intrinsic goal

framing led to higher levels of conceptual learning in early adolescents. Mouratidis, Vansteenkiste, Lens, Michou, and Soenens (2013) found that students who reported having intrinsic aspirations, also reported that they followed mastery approach to goals, regulated their academic effort effectively, and achieved higher grades. Ku, Dittmar, and Banerjee (2012) in addition found that pursuing extrinsic aspirations or specifically materialistic aspirations predicted lower academic achievement levels. Niemiec, Ryan and Deci (2009), furthermore conducted a longitudinal study including college graduates, and reported that the attainment of intrinsic aspirations predicted improved psychological well-being, whereas extrinsic aspirations did not.

Several South African based studies have considered aspirations as part of their design. Davids and Roman (2013), for instance, found that adolescents from single parent households in their sample, reported that they pursued intrinsic aspirations and Roman et al. (2015), found that authoritative parenting styles (i.e., warm and nurturing) promoted the pursuit of intrinsic aspirations.

2.6.5 MOTIVATION, INTERNALISATION AND INTEGRATION

2.6.5.1. Intrinsic and extrinsic motivation

It is proposed in SDT, or more precisely in cognitive evaluation theory, that human beings experience both intrinsic and extrinsic motivation (Deci & Ryan, 2002). Intrinsic motivation occurs when people partake in activities that are inherently interesting with the absence of external incentives, while extrinsic motivation occurs when an individual engage in an activity to reach specific outcomes, not associated with the pure enjoyment of the task (Niemiec & Ryan, 2009). Differently put, people experience intrinsic motivation when they feel like they direct their own behaviour (i.e., internal locus of control), and extrinsic motivation when they feel controlled by external contingencies (i.e., external locus of control) (Vansteenkiste et al., 2010). Deci and Ryan (2000), furthermore, describe intrinsic motivation as a "lifelong growth function" (p. 232) where people as proactive growth orientated organisms will, once again, be more interested in activities that are interesting and facilitate psychological growth. The experience of basic psychological need satisfaction during activities over time, make it more interesting and hence, increase future intrinsic motivation for that activity (Deci & Ryan, 2000). Vansteenkiste et al., (2010), emphasise that people who are intrinsically motivated are not necessarily "enjoyment-seekers" (p. 107) or differently said hedonistically driven, but that enjoyment is a by-product of intrinsic motivation.

As mentioned before, basic psychological need support by teachers help learners to experience more intrinsic motivation in classrooms. In general, learners will experience a decrease in intrinsic motivation when teachers give learners controlling rewards or make them focus on other external contingencies (e.g. academic performance) (Deci & Ryan, 2002). Deci and Ryan (2000), however, mention that some rewards are more controlling than others. For example, an unexpected reward after task completion, may be less controlling than rewards before task completion. Teachers could also provide learners with informational instead or controlling rewards before activities, by emphasising learner choice and giving competency feedback (Deci & Ryan, 2000)

Several existing findings show the importance of intrinsic motivation for positive academic outcomes. Renaud-Dubé, Guay, Talbot, Taylor & Koestner (2015) for instance, reported that intrinsic motivation predicted French speaking learner's intention to persist in school. Bailey and Phillips (2015), found that intrinsic motivation predicted academic performance in Australian undergraduate students and Taylor, Jungert, Mageau, Schattke, Dedic & Koestner, (2014) reported that intrinsic motivation was the only type of motivation that was consistently associated with academic achievement over a one-year period.

2.6.5.2. Internalisation, autonomous and controlled motivation

People in general, however, must complete various externally imposed tasks in their lives that they may not find interesting nor enjoyable, in order to reach important outcomes. SDT theorists propose that it is possible for people to feel autonomous during externally imposed tasks, when they receive basic psychological need support (Ryan & Deci, 2006). More specifically, SDT theorists propose in their organismic integration mini-theory, that people have an innate tendency to adjust external norms or expectations in order to believe that is important to them, hence creating a unified perception of self in society and an own sense of self (Deci & Ryan, 2002; Vansteenkiste et al., 2010).

People according to SDT, therefore, experience autonomous-, controlled- or amotivation when engaging in externally imposed tasks (Ryan & Deci, 2006; Vansteenkiste et al., 2010). Autonomous motivation occurs when people willingly partake in behaviour because it is self-endorsed while, controlled motivation ensue when people engage in behaviour because they feel like they should or are forced to (Vansteenkiste et al., 2010). Both autonomous and controlled motivation lead to high levels of motivation whilst amotivation occurs when people are not motivated at all (Vansteenkiste et al., 2010). The experience of autonomous motivation instead of controlled motivation, however, help people to experience improved health and well-being (Brunet, Burke & Sabiston, 2013) as well as subjective well-being (Nix, Ryan, Manly & Deci, 1999). People, moreover, display different self- regulatory styles when confronted with externally imposed tasks (Deci & Ryan, 2000, Vansteenkiste et al., 2010), as displayed in figure 2.2. on the following page.

External regulation occurs on the one extreme of the internalisation continuum, because it is the most controlled type of motivation. People experience external regulation when they are entirely motivated by external contingencies (e.g. reward or punishment), and thus have not internalised the behaviour at all. These behaviours are not well maintained nor transferrable to other situations when contingencies are removed (Deci & Ryan 2000; Vansteenkiste et al., 2010). A learner therefore studies hard for a test only because his parents have offered him a financial incentive. However, there is no guarantee that the learner will do the same in other tests later.

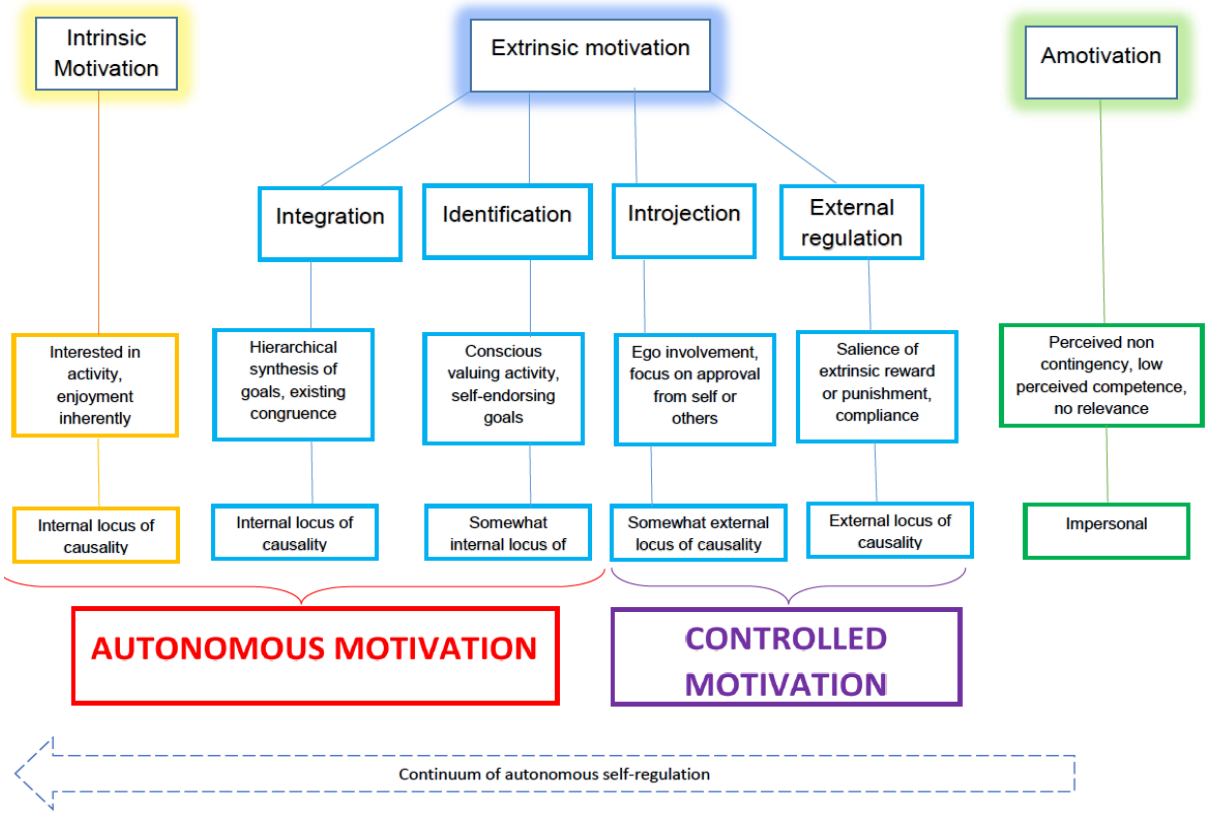

Figure 2 2. Continuum of internalisation. Adapted from Deci and Ryan (2000) and Vansteenkiste et al. (2010)

Introjection refers to a self-regulatory process where people are motivated to engage in behaviour because they are administering internal contingencies to themselves (e.g. pride, shame, or guilt). The externally imposed tasks are therefore not internalised (Vansteenkiste et al., 2010). The maintenance of introjected regulations is however more likely (Deci & Ryan 2000) than was the case with external regulation. A learner, therefore, spends a lot of time studying for exams because he is afraid of disappointing himself or is concerned about how others (e.g. parents or teachers) will perceive his academic failure.

Identification takes place when an individual appreciates an underlying value of the behaviour, is able to internalise it to some extent, and thus autonomously engages with the task. Identification is therefore a form of autonomous motivation (Vansteenkiste et al., 2010) and is associated with higher levels of maintenance, improved performance, and commitment (Deci & Ryan, 2000). A learner therefore partakes in schoolwork because he understands that it is important to do so to go to a University later.

Integration occurs when an individual not only identifies with the instrumental nature of behaviour, but is also able to integrate those identifications with all other parts of their self. The external regulations are therefore fully accepted by the individual and are in coherence with other aspects of their identity, and the accompanying behaviours are therefore self-determined and self-regulated (Deci & Ryan, 2000, Vansteenkiste et al., 2010). For example, a learner invests a great deal of time and effort in his studies

not only because he wants to enter a tertiary institution but also because he values academic achievement for his own reasons. This learner moreover does not experience inner conflict between for instance: being a hard-working person, a son, a friend, or an athlete. Integration, although considered to be the most autonomous form of extrinsic motivation, is still different from *intrinsic motivation,* because the activity is not done because it is interesting in its own right (Deci & Ryan, 2000).

Several researchers have reported that autonomous motivation lead to higher academic achievement levels. Kusurkar, Cate, Vos, Westers and Croiset (2013), for instance, report that relative autonomous motivation predicted the use of effective study skills and behavioural effort which in turn predicted academic achievement in medicine students. Soenens and Vansteenkiste (2005) found that higher levels of autonomous self-regulation predicted higher levels of GPA averages (study 1). Fortier, Vallerand and Guay (1995) reported that autonomous motivation predicted academic performance in ninth grade students and Grolnick, Ryan and Deci (1991) found autonomous self-regulation was positively associated with academic achievement in their Gr. 3 to Gr. 6 learner sample.

Higher levels of autonomous motivation also lead to other positive academic outcomes. Katz, Eilot and Nevo (2014), found that autonomous motivation mediated the association between self-efficacy and homework procrastination. De Naeghel, Van Keer, Vansteenkiste and Rosseel (2012) reported that recreational autonomous reading motivation was associated with positive reading behaviour and improved performance in fifth grade learners. Katz and Cohen (2014) used a projective assessment of autonomous motivation in cognitively impaired learners, and reported that autonomous motivation predicted positive affect, while Kyndt, Dochy, Struyvena and Cascallara (2011) reported that autonomously motivated students in their study were less likely to feel that they have a lack of information, or use surface approach learning techniques.

Two studies utilising a South African sample, have also assessed the association between autonomous motivation and university outcomes. Muller and Louw (2004), reported that their South African university sample reported higher levels of intrinsic and identified motivation, which in turn was correlated with study interest. Pietersen, Louw and Dumont (2009) found that disadvantaged university students who reported higher levels of autonomous motivation displayed higher levels of academic achievement.

2.6.5.3. Self-concordance and the multi-level personality in context model

As mentioned in the previous section, it is important for people to agree and identify with the outcome of an externally imposed task, to experience internalisation. It makes sense that people will only be able to agree and identity with an outcome of an activity, if they believe that it in agreement with how they describe themselves or what they want to achieve in the future. In SDT, authors refer to self-concordance as the autonomous pursuit of goals that reflect people's enduring interests and values (Sheldon & Elliot, 1999), that is a high level of integrated functioning (Deci & Ryan, 2000). It therefore appears that self-

concordance is one instance in SDT literature, where authors consider the association between autonomous motivation and self-content (i.e., enduring interests and values).

Sheldon and Elliot (1999) and Sheldon and Houser-Marko (2001) found evidence for a model, in which self-concordant goal motivation predicted sustained effort and goal attainment, which in turn predicted basic psychological need satisfaction and well-being. Self-concordance is increased by improved self-insight (Sheldon, 2014), regarding one's interests and values (Sheldon, 2002), autonomy support (Smith, Ntoumanis & Duda, 2007) and the selection of intrinsic goals (Sheldon & Kasser, 1998). Sheldon and colleagues operationalise self-concordant goal selection in their studies, by asking participants to list their personal projects (Little, 1993) or strivings (Emmons, 1989), and then assessing whether these personal projects or strivings are pursued for autonomous or controlled reasons (e.g. Houser-Marko & Sheldon, 2001; Sheldon et al., 2004; Sheldon & Kasser, 1995; Sheldon et al., 2002).

Sheldon, Prentice et al., (2015), maintain that theoretically, "self-concordant goals simply feel like they reflect one's deeper personality" (p. 336) but also state later on that this theoretical assumption has not been investigated yet. This statement is probably based on of the newly developed "Multi-level Personality in Context Model" (MPIC) (Sheldon, 2009; Sheldon, Cheng & Hilbert, 2011). To elaborate, the MPIC model offers an integrated explanation of human motivation and subjective well-being, and is based on a hierarchical personality approach, as proposed by McAdams (1996) (cf. section 2.7.3.2). Following a hierarchical approach, the MPIC model shows that traits (e.g. personality) and goals (e.g. aspirations) represent mid-level structures while self-processes (e.g. identity) inform the most in-depth part of personality. Based on this hierarchical conceptualisation of personality, it makes sense why Sheldon, Prentice et al. (2015) would argue that they have not yet proven that self-concordant goal selection reflects deeper personality content. Differently put, it is not a foregone conclusion that when people list their personal projects or goals (as mid-level structures) that they are referring to their identity content (as deeper-level structure) (Koestner et al., 2002; McAdams, 1996). Thus, it appears Sheldon, Prentice et al., (2015) propose that goals can only be a true reflection of people's enduring interests and values, when they form part of, or originate from identity content. I also question in the present study, whether self-concordance and internalisation are based on identity content (cf. chapter 1, section 1.3)

Students who experience self-concordance, display improved academic functioning. Sheldon and Houser-Marko (2001), reported that university students who experienced self-concordance displayed improved goal attainment and adjustment. Vasalampi, Salmela-Aro, and Nurmi (2009) reported that adolescents who pursued self-concordant achievement goals, displayed increased behavioural investment in achievement related goals as well as school engagement. Gaudreau (2012) found that undergraduate students in his sample, who pursued self-concordant mastery goals reported academic satisfaction and higher levels of academic achievement.

2.6.5.4. The hierarchical model of intrinsic and extrinsic motivation

Vallerand (1997) also utilised SDT constructs to create a hierarchical approach to motivation, called the hierarchical model of intrinsic and extrinsic motivation (HMIEM). The HMIEM model has been utilised in several domains including the academic (e.g. Guay, Mageau & Vallerand, 2003), sport (e.g. Gillet, Vallerand, Amoura & Baldes, 2010) and career domains (e.g. Senécal, Vallerand & Guay, 2001). The HMIEM model like SDT, acknowledges the importance of intrinsic and extrinsic motivation and internalisation (Vallerand, 2000). Vallerand (1997), however also differentiates between three types of intrinsic motivation, namely: intrinsic motivation *to know*, intrinsic motivation *to accomplish* and intrinsic motivation to *experience stimulation* (Vallerand, 1997). Vallerand (1997) moreover, proposes that three levels of hierarchical generality influence motivation namely *global* (personality), *contextual* (domain) and *situational* (state) levels. The global level refers to a general tendency of human beings to want to take part in intrinsic or extrinsic activities, and is similar to causality orientations as discussed in SDT. The contextual level includes motivational orientations in specific life domains such as education or sport, while the situational level refers to motivational orientation during specific tasks (Vallerand, 1997). Basic psychological needs furthermore mediate the association between each level of generality and outcomes (Vallerand, 1997).

The HMIEM model differs from mainstream SDT theoretical assumptions in several ways. Vallerand (2000), for example, mentioned that he was not convinced at the time that basic psychological needs are innate or universal. Vallerand (1997), furthermore, proposed that levels of generality influence each other, in an “up-down” and “bottom-up” manner. Said differently, stable global level motivation influences more malleable contextual and situational motivational levels, or situational level motivation influences higher-level motivation over time (Vallerand, 1997). Existing research confirms that situational and contextual motivation, influence each other (e.g. Gillet et al., 2010) and that global motivation influence situational motivation (Guay et al., 2003).

In the present study, I utilise an autonomous self-regulation questionnaire (see chapter 3, section 3.7.4.4, for full discussion), to operationalise autonomous motivation. The items included in this questionnaire, (e.g. “Others would get mad at me if I did not participate in academic activities at school”), seems to relate to situational and contextual motivation, and not global motivation. In other words, from an HMIEM model perspective, I did not measure the extent to which learners experienced global or dispositional autonomous motivation, but rather the extent to which they experienced autonomous motivation in specific academic situations.

In sum, in this section I discussed an internalisation process as proposed in SDT, by referring to autonomous self-regulation, self-concordance and the MLPIC and HMIEM models. Specifically, I mentioned that people, per SDT, need to agree and identify with the outcome of an externally imposed task before they can internalise the task and experience autonomous motivation. I argued that it would be necessary for people to understand how the outcome of an externally imposed task relates to

themselves on an identity level, in order to agree with it. Self-concordance is one instance in SDT literature, where authors consider the association between self-content and autonomous motivation. I refer to the hierarchical informed MLPIC model and argue, that self-concordance is not necessarily based on identity evaluations (as deeper-level structures), but personal goals (as intermediate-level structures). Moreover, I refer to the HMIEM model and argue that autonomous motivation in the present study relate to contextual or situational motivation, and not global motivation. Later in this chapter (cf. sections 2.7.3 and 2.7.4), I draw on the work of several authors who propose that identity content (as higher-order construct) has a more enduring influence on motivation than personal goals (as an intermediate or behavioural construct). Hence, I argue in the present study that only considering the effects of autonomous motivation (as operationalised in the present study), without considering identity regulation, delivers an incomplete picture of motivation.

2.6.6 SDT AND IDENTITY

2.6.6.1 Identities and basic psychological needs

It is important to note that SDT theorists do consider identity, especially within a developmental context. They usually describe identity as the various self-representations or life roles that people have (e.g. son, father, psychologist) (La Guardia, 2009; Ryan & Deci, 2011), or the set of values, aspirations, and representations that people use to define themselves (Soenens & Vansteenkiste, 2011). They also propose that identity/ies are created to experience basic psychological need satisfaction. More specifically, people primarily adopt identities in service of (i) *relatedness*, to connect to significant others and understand who they are in relation to others, (ii) *competence*, to develop skills or knowledge and feel effective and (iii) *autonomy*, for authentic self-expression (La Guardia, 2009; Ryan & Deci, 2011).

SDT theorists, moreover distinguish between self and identity. A person's self refers to an innate lifelong developmental growth process that facilitates integration, and is energised by basic psychological need satisfaction (La Guardia, 2009; Soenens et al., 2011; Soenens & Vansteenkiste, 2011). An individual's identity, therefore, may or may not be consistent with their self, but resemble it when it allows for opportunities for need satisfaction (Soenens & Vansteenkiste, 2011). As mentioned before, basic psychological need satisfaction is associated with psychological well-being, and people therefore benefit from experiencing congruence between their self and identity. Congruence is experienced when identity related motives are autonomously pursued, and identity related goals are intrinsic in nature (Soenens & Vansteenkiste, 2011)

2.6.6.2 Autonomously motivated identity pursuits

Ryan and Deci (2011) argue that intrinsic motivation is important for early identity development. More precisely, Ryan and Deci (2011) propose that children initially engage in activities that are interesting and pleasing to them (e.g. playing in the ground). They also argue that people develop identities (e.g. being an archaeologist) based on intrinsically motivated activities when they are older, through differentiation of intrinsic motivation (Ryan and Deci, 2011). As mentioned before, most people must

partake in activities later in life, which they do not necessarily find interesting or pleasurable (i.e., externally imposed identities or tasks), because the outcome of the activity is instrumentally important to them. SDT authors argue, from an organismic integration point of view, that identities may be more or less integrated or assimilated into the self, and that basic psychological need satisfaction energises this integrative process (La Guardia, 2009; Ryan & Deci, 2011). People therefore, maintain or develop identities for autonomous or controlled reasons (La Guardia, 2009; Ryan & Deci, 2011), as influenced by basic psychological need satisfaction. It appears SDT theorists describe identities as autonomous, when identity-related behaviours are autonomously motivated, as have been discussed in section 2.6.5 (La Guardia, 2009; Ryan & Deci, 2011).

People experience no motivation or *amotivation* for identity related behaviour when they feel incompetent or find identity related behaviour uninteresting. The experience of amotivation for specific identities may not pose any significant problems for human functioning (e.g. I have never been competent in ballet nor particularly valued it, hence I embraced other identities) or result in unfortunate consequences (e.g. not feeling effective nor not valuing or identifying with oneself as being a mother, even though one has children) (Ryan & Deci, 2011). Regarding *external regulation*, people may adopt identities because they feel compelled to do so (e.g. becoming a soldier) or to obtain rewards and avoid punishment (e.g. teacher's pet). These identities however do not reflect the self, and therefore lead to lower levels of need satisfaction (Ryan & Deci, 2011). Identity related behaviours are considered to be *introjected* when people participate in behaviours, or adopt an identity in order to boost, uphold or avoid jeopardising their self-esteem (Ryan & Deci, 2011). Some people, for instance, engage in introjected regulation, when they have experienced conditional love or regard from caregivers (Assor, Roth & Deci, 2004). The adoption of identities for introjected reasons, however, result in poor psychological well-being outcomes. For example, Hodgins and Knee (2002) reported that ego invested self-structures led to a fragmented sense of self. People experience autonomous motivation for identity related behaviours when they are able to experience internalisation. More specifically, people consciously endorse values underlying a particular identity or feel that outcomes associated with an identity is worthwhile (e.g. being a student will allow me to pursue my chosen career later on) when experiencing *identified regulation* for identity-related behaviour (Ryan & Deci, 2011). People who experience *integrated regulation* in terms of identity-related behaviour, not only endorse the underlying values of the identity but also feel that their endorsement of one identity resonates or relates to all other identities (e.g. experiencing harmony between being a student, mother, friend, wife) (Ryan & Deci, 2011).

It is important to note that each of the aforementioned regulatory styles may be more or less active, in the various identities that people uphold (La Guardia, 2009). For example, being a psychologist in private practice may include intrinsically motivated aspects (e.g. facilitating psychotherapy) or more externally regulated aspects (e.g. doing admin tasks). People who autonomously pursue identity-related commitments furthermore, "are likely to experience a greater sense of psychological freedom in carrying out identity relevant activities, become more skilled in them and receive more social support" (Soenens & Vansteenkiste, 2011, p. 387).

2.6.6.3 Intrinsic versus extrinsic identity related goals

Soenens and Vansteenkiste (2011) moreover argue that people's identity commitments may include intrinsic or extrinsic goals. People who pursue intrinsic aspirations, experience higher levels of basic psychological need satisfaction (cf. section 2.6.4), and it therefore makes sense that people who pursue identity commitments including intrinsic aspirations, experience congruence between self and identity (Soenens and Vansteenkiste, 2011). Soenens and Vansteenkiste (2011), furthermore, argue that people occasionally pursue extrinsic aspirations when they feel insecure about their identity (e.g. I am a worthless person), because the attainment of extrinsic aspirations give immediate relief (e.g. I want to lose an excessive amount of weight so that other people may think that I am worthwhile). Soenens and Vansteenkiste (2011) therefore propose that not all identity commitments lead to psychological well-being.

2.6.6.4. Empirical support with specific reference to identity development

Most existing SDT investigations on identity, are done in relation to identity development. SDT theorists often investigate the association between identity exploration styles as proposed by Berzonsky (1989) (see section, 2.7.2.3) and *causality orientations* and report that an autonomous causality orientation leads to positive identity developmental outcomes. For example, an autonomous causality orientation is associated with an informational identity style and negatively associated with a diffuse avoidant style, while a controlled orientation is associated with a normative identity style (Soenens et al., 2005). Moreover, people with an autonomous causality orientation that use information orientated identity styles, also display identification with identity commitments and higher levels of self-esteem (Luyckx, Soenens, Berzonsky et al., 2007). Luyckx, Schwartz, Soenens, Vansteenkiste and Goossens (2010), furthermore reported that an autonomy orientation is associated with commitment making.

Some authors have also considered the influence of autonomous *motivation* or *autonomy support* on identity styles. It appears that pursuing identity styles for autonomous reasons, and the experience of autonomy support, enhances positive identity development. Smits, Soenens, Vansteenkiste, Luyckx and Goossens (2010) for instance reported that autonomy motives underscored informational identity styles. Soenens et al. (2011), furthermore reported that an informational identity style is associated with autonomous motivation, and that a part of the relationship between identity style and adjustment in their study, was mediated by motives for commitment (i.e., how autonomous identity commitments were). Motives, furthermore, contributed to adjustment over and above commitment strength (Soenens et al., 2011). Furthermore, it appears that perceived autonomy support is associated with autonomous motivated identity styles (Smits et al., 2010), as well as identification with commitments (see also section 2.7.2.4) (Luyckx, Soenens, Berzonsky, Goossens & Vansteenkiste, 2007).

Recently some researchers have investigated the association between*, need satisfaction* and identity styles. Duriez, Luyckx, Soenens and Berzonsky (2012) for instance, reported that normative identity styles predicted increases in extrinsic goal strivings and that extrinsic goal strivings related to a decrease in informational identity styles.

In the present study, my conceptualisation of identity differs in some regards from how it is defined in SDT (see section 2.6.4 for overview). In short, I propose that identity is a more enduring construct, containing long-term self-descriptions, that have a long-term influence on behavioural commitments (see section 2.7.3). Thus, I propose, unlike SDT theorists, that identity has a self-regulatory function that have an impact and long-term behavioural decisions, because people want to experience meaning and coherence in life.

2.6.7 SDT AND MEANINGFULNESS

There are few existing studies that have explicitly and systematically investigated the role of meaningfulness in motivation, in addition to autonomous self-regulation, and basic psychological need satisfaction (e.g. Davis et al., 2016). Instead, a review of SDT literature showed three predominant ways in which meaning have been conceptualised, including: meaning in life as resembling an eudaimonic *well-being outcome* and meaning derived from *internalisation* and *intrinsic aspirations.* SDT theorists, moreover, do not regard *meaningfulness as basic psychological need*. In this section I give a brief overview of SDT literature, in which reference is made to meaningfulness.

2.6.7.1. Meaning in life as part of eudaimonic well-being

From a SDT point of view, hedonism refers to the pursuit of goals to reach a pleasurable outcome, while eudaimonic well-being refers to the pursuit of meaningful endeavours to fulfil personal potentials (Ryan et al., 2008). An important indication of eudaimonic well-being is, therefore, the extent to which people experience their lives as meaningful, worthwhile, and significant (Ryan et al., 2008; Weinstein, Ryan et al., 2008) It is, therefore, not surprising that the majority of SDT investigations that have included meaningfulness in their research designs, refer to it as a psychological well-being outcome (e.g. Bailey & Phillips, 2015; Vansteenkiste et al., 2004; Vansteenkiste, Lens et al., 2005; Weinstein et al., 2011; Weinstein, Przybylski et al., 2012).

As mentioned before, basic psychological need satisfaction leads to psychological well-being (cf. section 2.6.1). It therefore makes sense why Ryan et al. (2008) propose that basic psychological need satisfaction is an important component of eudaimonic well-being, and that Weinstein, Ryan et al. (2012) argue meaningful endeavours (operationalised as purposes) will only result in well-being when accompanied with need satisfaction. To illustrate, Weinstein, Ryan and Deci (2008) (cited in Weinstein, Ryan, et al., 2012), found that basic psychological need satisfaction mediated the association between the pursuit of meaning in life and psychological well-being outcomes. As noted before, people tend to experience higher levels of need satisfaction when they experience autonomous motivation and/or when they pursue intrinsic aspirations. Goal content and motivation type therefore also influence the extent to which people feel that they are living a meaningful or worthwhile life (Weinstein, Ryan, et al., 2012).

2.6.7.2. Meaning through internalisation

SDT theorists, also, argue that *intrinsic motivation* and *internalisation* give meaning in life, because it offers people a sense of coherence (Weinstein, Ryan et al., 2012). Weinstein, Ryan et al. (2012), for

instance, argue that people's inherent tendency to engage in *intrinsically motivated* activities when they are young, help them to make meaning of life, by exploring and understanding themselves and the world that they live in. Additionally, as mentioned before (cf. section ,2.6.5.2) people, per organismic integration theory, have an innate tendency to internalise externally imposed tasks so that they can experience an integrated sense of self. It is therefore not surprising that Weinstein, Ryan et al. (2012) propose that *internalisation* also give meaning in life, by offering a sense of coherence or "…internal harmony, purpose and wholeness" (Weinstein, Ryan, et al., 2012, p. 83), and Deci and Ryan (2000) propose that internalisation facilitates coherence within oneself. Thus, it is proposed that internalisation, creates meaning in life through the experience of coherence.

It also seems as though Weinstein, Ryan et al., (2012) propose that internalisation facilitates coherence during a short period of time, and that it is based on situational and not identity evaluations. More precisely, Weinstein, Ryan et al. (2012) argue that meaningfulness is created through mindfulness, and that people reconsider their personal meanings often. Ryan and Brown (2003) furthermore argue that "in mindfulness, and true self-determination, there is no fixed concept of self to protect or enhance; "all the facts are friendly" and all inform one's experiences and behaviours" (p. 75).

2.6.7.3. Meaningfulness from intrinsic aspirations or purposes

Weinstein, Ryan et al. (2012) equate purposes with aspirations, and argue that only intrinsic purposes lead to meaning in life. Weinstein, Ryan et al. (2012), therefore, refer to SDT literature on goal content differences, and propose that intrinsic aspirations/purposes lead to both psychological well-being and meaning in life, because it is inwardly focused and results in basic psychological need satisfaction. (cf. section 2.6.4). Weinstein, Ryan., et al. (2012) furthermore say that "only pursuits that provide basic psychological need satisfaction will be experienced meaningful when one reflects seriously upon them" (p. 93), probably because need satisfaction leads to psychological well-being. For example, Weinstein et al. (2008) (cited in Weinstein, Ryan et al., 2012) found that participants who pursued intrinsic aspirations wanted, searched for, and experienced meaning in life, while those participants who pursued extrinsic aspirations, also wanted, and searched for meaning but did not experience meaning in life.

2.6.7.4. Meaningfulness as a need in SDT

Several SDT theorists maintain that meaningfulness is not a fundamental or psychological need (Sheldon et al., 2001; Weinstein, Ryan, et al., 2012). Sheldon et al. (2001), for instance, compared ten psychological needs to determine which needs are fundamental psychological needs. Sheldon et al. (2001), described needs as fundamental, when participants reported that the need was salient in their minds when thinking of past satisfying events, and lead to positive affect. One of the 10 needs included, was referred to as self-actualisation-meaning, which was conceptualised as "feeling that you are developing your best potentials and making life meaningful rather than feeling stagnant and that life does not have much meaning" (Sheldon et al., 2001, p. 339). Sheldon et al. (2001), reported that only autonomy competence, relatedness and, interestingly enough self-esteem, represented fundamental needs, while self-actualisation-meaningfulness was not a fundamental need.

Weinstein, Ryan, et al. (2012) also contend that meaningfulness is not a basic psychological need, because meaningfulness does not convey specific content necessary for optimal human functioning and integration. Instead, Weinstein, Ryan et al. (2012) argue, that meaningfulness, in the sense of living a worthwhile life, is the result of basic psychological need satisfaction following internalisation and the pursuit of intrinsic aspirations. Therefore, they consider meaningfulness as an outcome of self-determination, which makes sense considering that most SDT researchers consider meaningfulness as a well-being outcome. However, as discussed before I argue that meaningfulness does not only resemble psychological well-being, but also influences which behavioural decisions people make and the extent to which people feel motivated. From this perspective, I propose that the necessary conditions for the fulfilment of meaningfulness as a need, includes the experience coherence and purpose in life when people pursue significant identity-related future identity goals (cf. section 2.7).

2.7 MEANINGFUL COMMITMENT

2.7.1 MEANING IN LIFE

People have contemplated the meaning in life since earliest of times (e.g. Aristotle, 322 BC). While philosophers usually consider the *meaning of life*, most psychologists study the factors that help people to experience *meaning in life* (Martella & Steger, 2016). Frankl (1978), originally wrote extensively about the importance of meaning in life, and proposed that the main purpose of life is to create meaning, in both adverse and prosperous situations. His work was in many regards a rebuttal on existing psychological approaches at the time, that did not acknowledge human agency (e.g. Skinner, 1974; Freud, 1923). Authors since have studied meaningfulness in several domains, such as: religion (e.g. Wright, Frost & Wisecarver, 1993), coping (e.g. Park, 2010), positive psychology (e.g. Antonovsky, 1987), psychotherapy (e.g. Hill et al., 2015), work engagement (Savickas, 1991) and education (e.g. Bruner, 1991). Research findings in general seem to show, that meaningfulness is associated with well-being, while the lack thereof leads to negative consequences (Dezutter, Luyckx & Wachhotz, 2015; Steger & Kashdan, 2013). People who experience meaning in life, for instance, experience positive affect (Steger, Frazier, Oishi, & Kaler, 2006), psychological adjustment (Thompson, Coker, Krause, & Henry, 2003), effectively cope with chronic diseases (Sherman & Simonton, 2012), display optimism (Ho, Cheung & Cheung, 2013), experience personal growth (Ryff, 1989) and display less avoidance coping (Edwards & Holden, 2001).

Some authors refer to a tripartite conceptualisation of meaning (George and Park, 2016; Heintzelman & King, 2014; Martella & Steger, 2016) in which it is proposed that meaning in life is influenced by a (i) sense or coherence or comprehension, (ii) purpose and (iii) significance or existential mattering. More specifically, as Steger (2012) proposes:

> Meaning is the web of connections, understandings, and interpretations that help us comprehend our experience and formulate plans directing our energies to the achievement of our desired

> future. Meaning provides us with the sense that our lives matter, that they make sense and that they are more than the sum of our seconds, days, and years (p. 65).

Based on this definition by Steger (2012) and the work of others (George and Park, 2016; Heintzelman & King, 2014; Martella & Steger, 2016), I propose that people experience meaning, when they experience *coherence* within themselves and in life, when they pursue *significant* and *purposeful* future identity goals. In the following sections I discuss each component of meaning in life separately.

2.7.1.1 Meaningfulness: coherence

Some authors describe coherence as a *cognitive* component of meaning, because it allows people to feel like their lives make sense and, that their daily decisions are predictable (Heintzelman & King, 2014; Reker & Wong, 1988; Steger, 2012; Wong, 2012). Differently put, coherence "allow people to understand who they are, what the world is like and how they fit in" (Wong, 2012, p. 11). Several authors, furthermore, propose that coherence in life is important part of psychological well-being (e.g. Baerger & McAdams, 1999; Ryff, 1989; Ho et al., 2013), in many cultures (e.g. English & Chen, 2007; Heine et al., 2006). It is also noticeable that it is proposed in several developmental theories, such as psychosocial developmental theory (Erikson, 1968), cognitive developmental theory (Piaget, 1964) and others (i.e., Skinner, 1974, Vygotsky, 1978, etc.) that people strive to have a coherent understanding of themselves and how they relate to the world throughout their lives. For example, in psychosocial development theory, it is noticeable that all the developmental stages (i.e., basic trust vs. mistrust; autonomy vs. shame and doubt; initiative vs. guilt; industry vs. inferiority; identity vs. role confusion; intimacy vs. isolation; generativity vs. stagnation, ego integrity vs. despair) (Erikson, 1968) to some extent relate to a human need for coherence in life. Therefore, I concur with other authors that people need to feel that their life experiences and goal directed decisions form a coherent or predictable pattern, and that people are motivated to maintain a sense of coherence in life (Antonovsky, 1987, Heine et al., 2006).

Heine et al. (2006), also propose in the meaning maintenance model (MMM) that all people have an innate need to experience coherence in life. The MMM is based on three assumptions. Firstly, Heine et al. (2006), argue that meaning is relational because "people seek coherent relations within the external world, within themselves, and between themselves and the external world" (Heine et al., 2006, p. 91). Aspects related to the external world refer to expected relationships with other people and places, while aspects of the self refer to self-beliefs that stay consistent across time and situations. Heine et al. (2006) secondly, propose that people are born with the inclination to routinely make meaning of life, and that people experience a greater need for coherence when they experience psychological distress. A third assumption underlying the MMM, relate to a process of fluid compensation, where Heine et al. (2006) propose that people focus on alternative points of references, when they experience a lack of meaning (Heine et al., 2006).

Several other authors also argue that people experience coherence and meaning on different levels (e.g. Baumeister, 1991; MacKenzie & Baumeister, 2014; Park & Folkman, 1997; Schnell, 2009). To elaborate,

these authors differentiate between global or *higher-level* meaning and coherence, which relate to long-term concerns, beliefs, or evaluations of life in general through time, and situational or *lower-level* meaning, that pertains to situational appraisals. Baumeister (1991) furthermore propose that (ii) higher-level meaning gives a frame of reference for lower-level meaning, (iii) higher-level meaning has an enduring influence on lower-level meaning, while lower-level meaning only influence higher-level meaning over a longer period and, (iv) people experience higher-level incoherence when they have lower-level meaning without higher-level meaning (e.g. daily plans but no plan for life) experience. Therefore, it is important to consider the influence of both lower- and higher level meaning and coherence on motivation. In the present study, I argue that purpose informs future identity goals which in turn have an effect on higher-level meaning and coherence.

2.7.1.2 Meaningfulness: purpose

Purpose has been described as a *motivational* component of meaning (Steger, 2012; Reker & Wong, 1988; Wong, 2012), and concerns the pursuit of future states, ideals, or goals (Martella & Steger, 2016). Differently said, purpose relates to questions such as: "What does life demand of me? What should I do with my life? What really matters in life?" (Wong, 2012, p. 10). In the present study, I concur with McKnight and Kashdan, (2009) when they define purpose as "… central, self-organizing life aim that organizes and stimulates goals, manages behaviors, and provides a sense of meaning" (p. 242). I also argue that purpose is a source of meaning (Schnell, 2009), or a higher-order meaning construct (Baumeister, 1991; George & Park, 2013; MacKenzie & Baumeister, 2014), that has a long-term influence on which goals and aspirations people pursue. Purpose, therefore, increases perceived coherence by providing direction and consistency in life (Wong, 2012), which in turn motivate people to persist in goal pursuits, because they need to experience coherence. People who pursue purposeful goals, in turn, display improved resource allocation, overcome obstacles and display resilience because they usually select and prioritize specific goals to reach future outcomes, and avoid behavioural choices that prohibit them from reaching desired future states (McKnight & Kashdan, 2009; Scheier et al., 2006).

Purpose as a "subordinate goal manager" (McKnight & Kashdan, 2009, p. 243), however, differs from goals in the following ways. Goals have definite outcomes or endpoints (e.g. I can get 80% for this test) while purposes do not necessarily (e.g. I want to make a difference in the world) (McKnight & Kashdan, 2009). Purpose, moreover, is an important part of people's identity, while the same cannot be said of goals (McKnight & Kashdan, 2009). Goals are furthermore directed towards immediate outcomes, whilst purpose resembles a broader motivational mechanism that informs long-term goals. Hence, purpose informs goal or behavioural decisions, but behavioural and goal decisions itself do not have an immediate impact on purpose (McAdams, 2012; McKnight & Kashdan, 2009). Thus, only considering the impact of goals or even aspirations, on motivation, deliver an incomplete picture of long-term motivation.

2.7.1.3 Meaningfulness: significance

Both purpose and significance fulfil evaluative functions. Purpose concerns the valuation of future goals to reach future states, while significance concerns the evaluation of whether one's life is worthwhile and valuable (Matella & Steger 2016). People consider whether their lives in *general* are significant (George & Park, 2016; Heintzelman & King, 2014; Janoff-Bulman & Frantz, 1997, Schnell, 2009) as well as how present realities or *goal pursuits* help them to experience of significance in life (Davis, Nolen-Hoeksema, & Larson, 1998; Klinger & Cox, 2004).

More precisely, people experience existential mattering when they feel that their lives or existence, *in general*, are significant, valuable and contribute to the external world (George & Park, 2016). However, they do not merely feel that their lives are significant because they experience positive affect (Wolf, 2010), they also experience eudaimonia (McMahan & Renken, 2011; Martella & Steger, 2016; Wong, 2012). Waterman (2011) describes eudaimonia as feelings of "… rightness about one's actions, centeredness in what one is doing, strength in purpose, competence, fulfilment, being who one really is, and doing what one was meant to do." (p. 359). Waterman (1990/1993/2011) also refers to personal expressiveness as part of eudaimonia, when people have the subjective experience that their chosen activities align with their core self. It stands to reason then that people choose specific activities that help them to experience significance in life. Indeed, Emmons (2005) propose "goals are the concretized expression of future orientation and life purpose, and provide a convenient and powerful metric for examining these vital elements of a positive life" (p. 733). Hence, I argue that people choose and commit to specific *goals* that are significant in terms of purpose and a sense of coherence, so that they feel that their lives in general are significant and meaningful. Differently stated, people experience significance when they feel like they are living a worthwhile life, because they are experiencing experience coherence and purpose in life.

2.7.1.4 Meaning in life and motivation

Frankl (1969) originally proposed that human beings are motivated by a will to meaning. People therefore experience a need for meaning in life (e.g. Andersen et al., 2000; Baumeister, 1991; Heine et al., 2006) which I propose is satisfied when they feel that their lives are coherent, purposeful, and significant. Several authors, furthermore, propose that the pursuit of meaning in life influence human motivation and which goals people select (e.g. Baumeister, 1991, Klinger & Cox, 2004, Steger, 2012, Wong, 2012). Identity fulfils an important role in facilitating purpose and meaning (Adams & Marshall, 1996; Demerath, 2006; McKnight & Kashdan, 2009; Steger, 2012). In the present study, I concur with others that describe identity as a source of meaning-making (Oyserman & Markus, 1990) and I propose that people not only need to experience lower-level meaning or coherence (i.e., situational appraisals) but also higher-level coherence between their future identity goals (as informed by purposes) and their behavioural decisions (see also section 2.7.1.1). This need for coherence, in turn, make people persistently choose specific goals and activities that are significant in relation to their future identity goals.

In the following sections I offer an overview of personal identity, identity goals and regulation as well as meaningful commitment. I start off by giving a brief overview of adolescent identity development theory.

2.7.2 ADOLESCENT IDENTITY DEVELOPMENT

2.7.2.1 Erikson's epigenetic approach to identity formation

Erikson (1968) formulated an epigenetic approach to human development, in which he proposes that identity development is a life-long process that takes foreground during adolescence. Skills acquired during preceding psychosocial developmental stages, help people to effectively engage in identity formation (Kroger, 2006). For example, infants learn how to approach the world (i.e., trust vs. mistrust), later they develop the will to be themselves (i.e., autonomy vs doubt), toddlers develop an understanding of which future roles they must fulfil (i.e., initiative vs. guilt), and children select and complete future defining identity tasks (i.e., industry vs. inferiority) (Kroger, 2006).

Erikson suggests that introjection, identification, and identity formation form part of identity development (Stevens, 2008). During introjection, children internalise expectations from significant others into inner representations, while children adopt other individuals' attitudes and characteristics during identification (Stevens, 2008). Adolescence is however associated with various biological, psychological, and social changes, that make introjections and internalisations less useful, and adolescents consequently need to develop their own sense of self (Kroger, 2006). Adolescents accordingly, experience a period of identity exploration or moratorium (Erikson, 1968) during which they consider and reconsider existing identifications. An optimal outcome of identity exploration is the creation of an ego identity, which Erikson (1968) defines as "… a feeling of being at home in one's body, a sense of knowing where one is going, and an inner assuredness of anticipated recognition from those who count" (p. 165). A successfully formulated ego identity, therefore, offers a conceptualisation of the self that is the same or coherent over time and in different situations (McAdams & Zapata-Gietl, 2015).

Adolescents acquire the virtue of fidelity upon the successful completion of identity formation, meaning that they feel comfortable with their own or unique sets of values or standards as part of their identity (Hammack, 2015). An unsuccessful outcome of identity formation is, however, role repudiation or role diffusion, which makes it difficult for adolescents to integrate different values or aspects into one functional identity. Role repudiation moreover leads to diffidence, where adolescents find it difficult to express themselves or go against acceptable norms (Feist & Feist, 2008).

Several authors expanded Erikson's work by creating process orientated approaches to identity formation (e.g. Berzonsky, 1989, Luyckx, Goossens, Soenens & Beyers, 2006, Marcia, 1966) I will now discuss some of these theoretical approaches.

2.7.2.2 Identity statuses

Marcia (1966), argued that identity formation does not necessarily only result in two outcomes (i.e., identity achievement and diffusion), but rather four identity statuses. Marcia (1980) explained that considering four statuses create a broader and more balanced framework for understanding identity formation. Marcia's identity statuses are based on the assumption that people differ in the extent to which they engage in identity exploration and commit to identity relevant options (Côté & Schwartz, 2012).

Marcia (1966/1980) proposed four identity statuses, based on the extent to which people engage in identity exploration and commitment. *Identity achievements*, are individuals who have experienced exploration and are willing to commit to self-endorsed identity-relevant choices (Marcia, 1980). These individuals, furthermore, are flexible in their reasoning but not easily influenced by external pressures. Individuals displaying identity achievement therefore persevere in activities, and experience as Erikson would put it, sameness, or coherence in self (Kroger & Marcia, 2011). *Foreclosures*, are adolescents that display commitment to specific identity options, that have been imposed by parents or other significant individuals (Marcia, 1980). Their commitments are easily perturbed, they become defensive, are not willing to consider alternatives, and experience guilt when questioning normative values (Kroger & Marcia, 2011). *Moratoriums* are individuals who find it difficult to commit to identity related options, and hence experience identity crisis. Some moratoriums are active identity explorers, who challenge others to reach a self-endorsed identity commitment, whilst other moratoriums are perpetually engaged in identity exploration (i.e., rumination) without experiencing identity commitment, which sometimes results in pathological outcomes (Kroger & Marcia, 2011). Marcia (1966) originally described *identity diffusions* as individuals that have no identity commitments, regardless of whether they experienced identity exploration or not. Later, it was discovered, that identity diffusions generally experience ineffective identity exploration periods (Marcia, 1976). Adolescents who experience identity diffusion, therefore, have an undefined and unstable sense of self, are easily influenced by what others expect of them and sometimes look to other individuals to define them (Kroger & Marcia, 2011). Many identity diffusions therefore according to Kroger and Marcia (2011) experience of "an empty and meaningless life" (p. 35).

2.7.2.3 Identity styles

Berzonsky (1989) proposed a social-cognitive approach to identity formation, in which he argued that identity consists of self-theories that influence how people evaluate situations, make decisions, and solve problems (Berzonsky, 2011). Berzonsky argued that four different identity styles (also referred to as processing orientations or cognitive styles) influence how identity-relevant information are evaluated, reviewed and utilized (Berzonsky, 1989; Berzonsky & Ferrari, 1996; Schwartz, Mullis, Waterman & Dunham, 2000). Identity styles, in other words, refer to people's preferred social-cognitive strategies that they use to negotiate identity conflicts (Berzonsky et al., 2013).

People with an *informational identity style* actively seek, understand, and assess identity related information before making decisions (Berzonsky, 1989). They tend to be self-reflective, critical, are willing to consider contrary viewpoints and usually, following Marcia's theory, display identity achievement or moratorium status (Berzonsky et al., 2013). Individuals with a *normative identity processing style*, conversely, prefer to obey prescriptions from significant others (Berzonsky, 1989). People who prefer a normative identity style, also tend to be conscientious and stay committed to decisions, but display a foreclosed identity status (Berzonsky et al., 2013). Their decisions are based on other people's evaluations and they may therefore become defensive, for their primary goal is to defend their existing self-structure (Berzonsky, 2011). Individuals displaying a *diffuse avoidant identity style* usually delay making identity-related decisions until situational realities or rewards force them to do so (Berzonsky, 1989). A diffuse avoidant identity style is associated with a diffused identity status, and is associated with unstable commitments, problem behaviours and an external locus of control (Berzonsky et al., 2013).

2.7.2.4 Exploration and maintenance of identity commitments

Luyckx et al. (2006), also developed a process approach to identity formation, based on Marcia's (1966) views on identity formation, and other theoretical approaches that consider *maintenance of commitments* (e.g. Meeus, Iedema & Maassen, 2002). Luyckx et al. (2006) discovered a four-factor model through confirmatory factor analysis including: commitment making, identification with commitment, exploration in breadth and exploration in depth. Exploration in breath concerns the search for identity alternatives, while commitment making refers to the enactment of identity alternatives in various situations (Luyckx, Schwartz, Goossens, Beyers & Missotten, 2011). Ruminative exploration, furthermore, is the persistent experience of apprehension about what one wants to achieve in life. Exploration in breath, commitment making and ruminative exploration seem to relate to Marcia's approach to identity formation, while exploration in depth and commitment identification refer to the maintenance of commitment as proposed by Meeus et al. (2002). More specifically, exploration in depth occurs when people accumulate information about current commitments to assess them, and identification with commitment happens when a person feels certain about their existing commitments, or that it is an accurate representation of own standards and desires (Luyckx et al., 2011). Luyckx, et al. (2011) furthermore, propose that identification with commitment is related to personal expressiveness as proposed by Waterman (1993) (cf. section 2.7.3.1).

2.7.2.5 Self-differentiation

From a family systems theory perspective, Bowen (1978) stressed the importance of self-differentiation for optimal psychological functioning. Self-differentiation refers to the internalisation of family relationships or norms in a sensible manner so that one experiences a balance between autonomy and connectedness as well as emotional and affective functioning (Skowron & Friedlander, 1998). On an intrapsychic level, self-differentiated individuals consider situations in a thoughtful manner whilst being

aware of their emotional reactions thus responding in a calm and logical manner. On an interpersonal level, people who are self-differentiated retain an autonomous sense of self, while connected to others (Charles, 2001). To this end, autonomy does not refer to the complete acceptance or rejection of parental norms, but the thoughtful consideration thereof in terms of how it relates to one's own norms or ideas (Skowron, Wester & Azen, 2004). Self differentiated people usually display higher levels of emotional flexibility and appear less emotionally reactive during situations, while undifferentiated people engage in emotional cut off or fusion (Skowron & Friedlander, 1998).

Self-differentiation is also an important part of personal identity development. To elaborate, self-differentiated people find it easier to take a firm I-position or "maintaining a clearly defined sense of self and thoughtfully adhering to personal convictions when pressured by others to do otherwise" (Skowron & Friedlander, 1998, p. 235). In addition, research findings suggest that a lack of self-differentiation have a negative impact on personal identity (Gushue et al., 2013, Mehri, Salari, Langroundi & Baharamizadeh, 2011) whilst people with higher levels of self-differentiation feel more secure about their identity and find it easier to pursue meaningful goals (Wilie, 1991).

2.7.2.6 Identity development, meaningfulness, and motivation

In the present study, I argue that identity development help people to experiencemeaning in life. To elaborate, adolescents must consider which future career they want to pursue, or what they would like to do in life, which arguably related to the consideration of purposes in life (cf. section 2.7.1.2). It is important for adolescents to have a clear idea of who they are, so that they have a consistent representation of themselves, across situations and throughout time. Having a consistent idea of oneself on an identity level, arguably, allow for higher-level coherence (cf. section 2.7.1.1). It is furthermore important for adolescents to explore or engage with different potential identity informing activities, in an open manner before committing to a particular identity. The activities that adolescents engage with during identity exploration, is therefore, help them to maintain a sense of coherence (cf. section 2.7.1.3). Considering what I have just discussed, it seems important to consider the impact of identity on adolescent motivation.

2.7.3 CONCEPTUALISATION OF IDENTITY

2.7.3.1 Personal identity

There appears to be some differences in opinion amongst identity theorists about: (i) the difference between self and identity (Roeser & Peck, 2009; Schwartz, et al., 2010); (ii) whether identity is primarily socially constructed or not (Jenkins, 2008; Marcia, 1980); (iii) if individuals hold singular or multiple identities (Erikson, 1968; Rattansi & Phoenix, 2005); (iv), whether we are implicitly or explicitly aware of identity processes (Devos & Banaji, 2003; Stryker & Burke, 2000) and (v) if our identities are discovered or constructed (Berzonsky, 1989; Waterman, 2011). Authors, furthermore, propose that identity consists

of several components (Vignoles et al., 2011) including (i) *relational components*: how a person identifies him- or herself in relation to others (e.g. being a mother or a child); (ii) *collective components*: how an individual identifies with groups (e.g. gender) and social constructs; (iii) *material components:* e.g. which car I drive and house I live in and (iv) *personal constructions:* e.g. how I describe myself (Vignoles et al., 2011).

In the present study, I focus on personal identity and its association with meaningfulness. I concur with Erikson (1968) and propose that identity is a stable description of oneself over time in different situations and like Marcia (1980) propose that identity contains *self-descriptions* which is "…a self-structure, an internal self-constructed, dynamic organization of drives, abilities beliefs, and individual history" (p. 159). Like other authors before (e.g. Schwartz et al., 2010), I differentiate between the *self* the human capacity for reflective thinking (Leary & Tagney, 2003) and *identity* as "to know itself as an object…" (Human-Vogel, 2013, p. 518). Stated differently, based on William James' definition of identity as discussed in Leary and Tagney (2003), I argue that the "me" (i.e., self as known) includes identity self-descriptions and the "I" (i.e., self as knower or agent) fulfils a self-regulatory function of identity. Simply put, I propose that people's identity, include self-descriptions of how they describe themselves now and in the future, and that these identity self-descriptions fulfil a self-regulatory function, by directing goal selections and behavioural pursuits.

2.7.3.2 Levels of identity

I also propose, like others, that identity and personality is comprised of different levels (Emmons, 1989, Little, 1993, McAdams, 1996, Shavelson & Marsh, 1986, Sheldon et al., 2011). McAdams (1995), specifically, discussed three levels of personality. *Level one* consists of dispositional personality traits (e.g. big five personality traits) that is acquired from birth onwards (McAdams, 2012). *Level two* consists of characteristic adaptations or personal concerns (e.g. personal goals, projects aspirations etc.), that is relevant to specific domains or time periods in a person's life and develops from middle childhood onwards (McAdams, 1996; McAdams, 2012). *Level three*, conversely, consists of identity constructs, also referred to as narrative identity (McAdams, 1996; McAdams, 2012). McAdams (2012) defines identity as "an internalised and evolving story of the reconstructed past and imagined future that aims to provide life with unity, coherence, and purpose" (p. 113). Identity from this perspective, therefore, include self-descriptions, that help people to have a coherent understanding of themselves through time (McAdams, 1996). Identity furthermore resembles a deeper-level construct that is more stable and less observable than traits (McAdams & Manczak, 2011). McAdams (1995), therefore, proposed that only understanding individuals in terms of their dispositional traits and personal concerns, deliver an incomplete picture of human personality. It makes sense then, that it is important to consider the influence of both identity and aspirations on motivation.

In the present study, I propose that there are hierarchical differences between identity content and personal goals or aspirations. As mentioned before, I conceptualise identity as resembling a stable self

structure that contains objective self-descriptions as influenced by life purposes (Bronk, 2011; Damon, Menon & Bronk, 2003; Burrow & Hill, 2011; Carver & Scheier, 1998; McKnight & Kashdan, 2009, Steger et al., 2006). Therefore, I propose that long-term self-descriptions (e.g. I want to be a good person) are more closely related to identity content than aspirations (e.g. I want to contribute to community). Identity content, therefore, has a long-term influence on the aspirations that people choose, meaning once again, that one should investigate the impact of both aspirations and identity on motivation and achievement outcomes. Earlier in this chapter (cf. sections 2.6.5.3 and 2.6.5.4), I presented an argument for why I believe that internalisation as proposed in SDT speaks to aspirations and personal goals and not necessarily identity content. I therefore included both meaningful commitment, that is related to identity commitment, and autonomous self-regulation in the present study to understand if these constructs deliver unique outcomes.

2.7.3.3 Future identity goals

People consider how they describe themselves in the present (e.g. I am a resilient person) as well as in the future (e.g. I want to continue being a resilient person), because they need to feel like they have an identity that offers a stable description of themselves over time and in various situations so that they can experience identity coherence (Erikson, 1968; McAdams, 1996; Gregg et al., 2011). Adolescents, specifically, have to think about the future to make important life decisions such as which future career paths to pursue (Blakemore & Choudhury, 2006; Nurmi, 1991), and subsequently have to consider their possible or future selves (Higgins, 1987; Hoyle & Sherril, 2006; Markus & Nurius, 1986; Oyserman et al., 2004).

Possible selves relate to people's self-knowledge about their potential, hopes and fears for the future, well as their present self-descriptions (Markus & Nurius, 1986; Oyserman & Markus, 1991). People are motivated by future or possible selves, when they want to attain hoped for future selves and avoid feared future selves (Ruvolo & Markus, 1992). Possible selves exist in the future, have not been realised yet, facilitate future orientated thinking (Hoyle & Sherril, 2006), and direct meaning-making efforts by linking present behavioural choices with a future identity related meaningful outcomes (Erikson, 2007; Oyserman & Markus, 1998). Oyserman et al. (2004), propose that adolescent's future possible selves will only influence present behaviour, when it is detailed and include workable strategies on how to attain possible selves. Possible selves are associated with long-term future identity goals (Pizzoato, 2006), and in the present study, I argue that learners have future identity goals as strategies (e.g. I want to be a successful learner, athlete or caregiver), in order to reach future possible selves (e.g. I want to be a successful person).

I also propose that some future identity goals are more salient than others (e.g. focussing on being a successful learner more than athlete) due to *socialisation experiences* and learner's *perceived ability* to engage with future identity goals. *Socialisation* experiences seem to have an impact on what people's expectations of the future, and subsequently possible self content. More specifically, negative gender

(Steele, 1997), cultural (Bi & Oyserman, 2015) and racial group (Kao, 2000), stereotypes as well as family influences (Honora, 2002) and socio-economic circumstances (Oyserman, Fryberg & Yoder, 2007) influence future identity content. I propose that these socialisation experiences not only influence possible self content, but also which future identity goals learners decide to actively pursue. For example, a girl who lives in poor socio economic circumstances and her parents or other people in the community only expect of her to be a successful mother, may decide to invest more effort into the future identity goal being a successful caregiver, than a successful student. I am not implying that the two identity goals are mutually exclusive, but that she might invest more effort in reaching the caregiving future goal, due to socialisation experiences. Furthermore, people also need to feel that they have the *necessary skills* or that they are *capable* of engaging with future identity goals or possible selves (Norman & Aron, 2003; Cross & Markus 1994; Erikson, 2007; Oyserman et al., 2004). For example, learners might decide to pursue the future identity goal of being a successful learner, when they believe that they have the academic skills to be successful, and avoid being an athlete when they do not feel like they have the necessary athletic traits to be successful.

Several investigations have indicated, that a positive future identity is beneficial for improved academic outcomes. For example, Oyserman, Bybee and Terry (2006) demonstrated that learners in an intervention group who received training to positively adjust their school-related future identities, behaviourally engaged more in their school work and consistently achieved higher marks after periods of one and two years. Anderman, Anderman and Griesinger (1999) found that a positive academic possible identity in Gr. 6 learners led to higher marks as well as the utilisation of mastery goals.

2.7.3.4 Identity and commitment

The association between commitment and behaviour, have been demonstrated in the career (e.g. Blau, 1985), interpersonal (Rusbult, 1980) and academic domains (e.g. Human-Vogel & Mahlangu, 2008). In general, commitment seems to refer to persistent lines of action that people engage in over time (Becker, 1960; Le & Agnew, 2003). As mentioned before, adolescents need to make identity commitments as part of identity development (Erikson, 1968, Marcia, 1966). It is therefore not surprising that authors argue that commitment can only be fully understood by considering the influence of identity on commitment (Human-Vogel, 2013, Lieberman, 1998). Yet, many motivational theorists only investigate the influence of goal commitment on behaviour (e.g. Klein, Wesson, Hollenbeck & Alge, 1999; Locke, Shaw, Saari, & Latham, 1981). Nevertheless, I concur with Human-Vogel (2013), and argue that there is a difference between goal commitment and identity commitment. More specifically, in the present study, I propose that identity commitment occurs when learners commit to meaningful behavioural and goal decisions based on long-term identity content, while goal commitment ensues when people commit to any goal for any reason, including pleasure, reward, meaningfulness etc. (see also my conceptual framework, section 2.9.4). Said differently, goal commitment on its own may, or may not be meaningful or identity relevant, whilst meaningful goal commitment is always related to identity content (Human-Vogel & Rabe, 2015).

Meaningful identity commitment and goal commitment deprived of meaning, however, lead to different academic outcomes. For example, there is a difference between learner A who decides to do his homework on a Thursday afternoon, because he does not want to be punished the next day, and learner B who persistently chooses to do his homework every day because it resonates with his identity self-descriptions (e.g. I am a hard-working person) and his future identity goal of being a successful learner. Learner A based his decision on short-term situational information (i.e., punishment) that will not necessarily always be present to motivate him in future. Leaner B's decision to do his homework that afternoon is, however, part of fulfilling larger future outcome (fulfilling future identity self-descriptions), that influences his behaviour over a longer period of time. Hence, I argue like Human-Vogel (2013), that meaningful identity commitment, as experienced by learner B, will have a more long-term influence on behavioural decisions than situational based goal commitment as experienced by learner A.

2.7.4 IDENTITY AS SELF-REGULATORY MECHANISM

Some authors argue that identity fulfils an executive function, by influencing the decisions that people make or the goals that they commit to (Baumeister et al., 2007; Becker, 1960; Kanter, 1968; Stryker & Serpe, 1982). People, therefore, usually do not act at random when setting goals because the executive function of identity has an influence on their goal-related decisions. Literature, furthermore, show that people experience increased goal motivation when their goals are identity related (Oyserman & Destin, 2010; Oyserman, 2007, Roeser, Peck, Nasir, 2006). More specifically, based on a hierarchical approach of self-regulation (Carver & Scheier, 1982; Lord et al., 2010; Vallacher & Wegner, 1987), I propose that identity has a long-term and enduring influence on the intermediate and lower-level goals that people select and pursue (see section 2.9.4 for a comprehensive discussion). From this perspective, I argue that identity regulation enhances motivation by giving *future direction in life* and *a sense of coherence.*

To elaborate, people develop a clear sense of self during identity formation (Erikson, 1968; Marcia, 1980) and self-differentiation (Bowen, 1978) (cf. section 2.7.2). As mentioned before, identity contains self-descriptions of how we would like to describe ourselves presently, and in the future. Identity as influenced by our perceived life purposes (McKnight & Kashdan, 2009), in many regards, therefore provide us with the internal standards or structure to our existence (Adams & Marshall, 1996), by informing us which goals to commit and identify with it (Hoyle & Sherrill, 2006). Thus, identity commitment has an ordering and structuring function (Human-Vogel, 2008) and *provide direction in life*. The pursuit of a future identity or possible self is, beneficial for present motivation because it enables people to set appropriate goals for future outcomes (Nurmi, 2004), to value present identity related goals (Miller & Brickman, 2004), and to look beyond present difficulties (Oyserman, Johnson & James, 2011).

In the present study, I also propose that the direction offered by identity regulation helps people to experience coherence. More specifically, as mentioned before people seem to prefer *coherence* within themselves as well in their relation to the world (Demerath, 2006; Gregg et al., 2011; Heine et al., 2006). People, therefore, need to feel that their lives make sense or is coherent, predictable, and thus meaningful, or as Erikson (1968) put it people need an identity that provide "sameness" or continuity

across situations and time. Indeed, research findings suggest that people experience poor-psychological well-being when they experience identity incoherence (North & Swann, 2009; Vignoles et al., 2011). I propose that people are motivated to pursue goals and behaviours that are significant or meaningful in terms of their future identity goals, so that they can experience a sense of identity coherence. Differently said, I propose that people engage in or self-symbolising, where they accumulate behavioural proof of future identity (Gollwitzer et al., 2012) to experience coherence. A person who is persistently engaged in behaviours to reaffirm future identities is therefore considered to be committed to their future identity goals (Gollwitzer et al., 2012) and individuals feel that behaviours or goals are meaningful when they allow them to stay committed to identity goals and reaffirm their future identities.

2.7.5 MEANINGFUL ACADEMIC COMMITMENT

Researchers usually operationalise academic commitment, by measuring the amount of time that learners spend on academic activities (Lee, Coladarci & Donaldson, 1996; Wong, 2000) or differently said, their student engagement levels (Kuh, 2009). Student engagement is, nevertheless, a multivariate construct that not only includes behavioural investments in learning tasks but also affective components, such as having a positive attitude towards learning or perceiving learning as personally meaningful (Appleton, Christenson & Furlong, 2008; Finn, 1989). Not enough attention is given to affective components of student engagement (Appleton et al., 2008), even though research findings point to the importance thereof for motivation (Ainley & Ainley, 2011; Brewster & Bowen, 2004; Steele & Fullagar, 2009).

Academic commitment theory, as proposed by Human-Vogel (2013), does consider the influence of affective components on student engagement. The academic commitment scale (Human-Vogel & Rabe, 2015) was adapted from the investment framework of commitment as informed by interdependence theory, that describes commitment in romantic interpersonal relationships (Rusbult, 1980). It is indicated in interdependence theory, that people decide whether they should stay in a relationship or not, based on how satisfied they feel, the quality of alternatives that they have available to them and how much they have already invested in the relationship (Human-Vogel & Rabe, 2015; Rusbult, Martz & Agnew, 1998). Human-Vogel and Rabe (2015), adapted the investment model scale and proposed that the following is relevant to academic commitment: (i) *satisfaction level*, indicating positive affect; (ii) *quality of alternatives,* which measures the perceived desirability of the best available alternative; (iii) *investment size,* which indicates the magnitude and importance of resources that have been invested in academic commitment and (iv) *meaningfulness,* which indicates identity commitment and the extent to which a person feels that their environment supports their expression of identity commitments (Human-Vogel & Rabe, 2015; Rusbult 1980). Human-Vogel & Rabe (2015), importantly, found that satisfaction, quality of alternatives and investment size predicted meaningfulness, which they tentatively argue indirectly show that meaningfulness is associated with commitment to academic success. Therefore, in the present study, I only utilise the meaningful commitment subscale to operationalise the extent to which academic

behaviours are "… experienced as reflective of the self and consistent with self-expression" (Human-Vogel & Rabe, 2015, p. 4).

Academic commitment is in many regards still a developing theory, and there is therefore only a few published investigations that have included the academic commitment scale in their research designs. In terms of the present study, it is important to note that Human-Vogel and Rabe (2015) reported that self-differentiation predicted meaningful commitment. This finding seems to suggest, that people that make rational decisions according to own personal standards or values, also make meaningful commitments (cf. section 2.7.2.1). It stands to reason, therefore, that people do not merely pursue meaningful commitments because they feel like they have to, they make a rational self-endorsed decision to do so (see also section 2.8.3.1)

Moreover, it is also important to note that Vogel and Human-Vogel (2016) found that meaningful commitment predicted academic achievement through investment size. The authors conceptualised meaningful commitment as a higher-order construct (as I do in the present study) and investment size as a task-level or lower-level construct. The fact that meaningful commitment only predicted academic achievement through investment size, seems to deliver tentative support for a hierarchical self-regulation approach to self-regulation, as used in the present study as part of my conceptual framework (cf. section 2.9.4).

2.8 CONCEPTUAL DIFFERENCES AND SIMILARITIES BETWEEN SDT AND MEANINGFUL COMMITMENT

2.8.1 BOTH SDT AND MEANINGFUL COMMITMENT NEEDS HUMAN AGENCY

SDT theorists describe people as agentic and proactive beings that seek psychological growth and well-being (Deci & Ryan, 2000). People similarly, actively pursue meaning in their lives (Frankl, 1963) and experience poor psychological and physical well-being, when experiencing a lack of meaning in life (Dezutter, et al., 2015; Steger & Kashdan, 2013). Bandura (2006) argues that people display agency when they (i) engage in self-regulation (i.e., self-reactiveness and self-reflectiveness) and experience (ii) intent and (iii) forethought. I propose that meaningful commitment also requires *intent and forethought*, because people *intentionally* commit to goals in order to reach future identity goals, that need *forethought*. Bandura (2006), furthermore, proposes that agentic people are *self-regulators*, meaning they deliberately make plans, select goals, and motivate themselves to reach outcomes, and consider whether self-regulatory efforts are functional or not (Bandura, 2006). Meaningful commitment, once again, is a self-regulatory process (cf. section 2.9.4), that involves meaningful goal selections which people feel motivated to pursue, because they want to experience a sense of coherence. A part of this self-regulatory process is also the rejection of meaningless goals, because it is not functional nor useful in terms of future identity goals

Gallagher (2000), moreover, argues that agentic people experience a sense of ownership, meaning, that they feel that they are the initiators of their own behavioural choices. As mentioned before, Human-Vogel and Rabe (2015), found that self-differentiation (i.e., the ability to make rational decisions according to own personal standards or values) predicted meaningful commitment. It therefore seems reasonable to propose that people who experience meaningful commitment and feel like they can make decisions according to their personal standards (i.e., future identity goals), experience a sense of self-ownership and agency.

2.8.2 SDT AND IDENTITY

As discussed in section 2.6.6., some SDT theorists refer to multiple identities (e.g. mother, child, psychologist) (La Guardia, 2009) that "we wear" (Ryan & Deci, 2011, p. 227) when discussing identity. In the present study, however, I refer to a singular identity and argue that the multiple identities that these authors make reference to, might relate to the various life roles that people fulfil in various contexts (e.g. I am a father, engineer, and body builder). These life roles tell a person what he should do in specific circumstances to fulfil expectations, but not necessarily how he would describe himself on an identity level, in different situations throughout time. I conversely propose that identity contains self-descriptions that influence people's behavioural decisions in all life situations throughout time (cf. section 2.7.3). Soenens and Vansteenkiste's (2011) explanation of identity as "the set of values and aspirations and representations that people use to define themselves" (p. 385), is, therefore, more closely related to how identity is defined in the present study. Nevertheless, I focus on the impact of future identity goals and not aspirations on motivation in the present study. More specifically, I draw on the work of several authors that propose that there are different levels of identity or personality, and argue that future identity goals have a more long-term influence on behavioural decisions than aspirations (cf. section 2.7.3.2).

Furthermore, I propose that identity is a source of meaning making and fulfils an important self-regulatory function, by influencing which goals and behaviours people commit to, in order to experience coherence (cf. section, 2.7.4). SDT theorists, however, usually consider identity in terms of its developmental consequences (cf. section 2.6.6.4), and it appear that they do not consider identity as fulfilling the same self-regulatory functions. Instead, Ryan and Brown (2003) argue that an over reliance on self-evaluations when making behavioural decisions lead to a contingent self-esteem, meaning that people only feel worthy when they have reached a specific standard or outcome. Ryan and Brown (2003), consequently state that "in mindfulness, and true SDT, there is no fixed concept of self to protect or enhance; "all the facts are friendly" (Rogers, 1961, p. 25), and all inform one's experiences and behaviours" (p. 75). This seems to imply that identity in SDT is a malleable construct, and that all situational experiences influence identity content. However, in the present study I conceptualise identity as a more enduring construct, that regulates behavioural choices, and argue that people will only change identity content (i.e., future identity goals and self-descriptions) after recurring situational experiences (see also, section 2.9.4.4).

2.8.3 ORGANISMIC INTEGRATION AND MEANINGFUL COMMITMENT

2.8.3.1 Meaningful commitment and controlled motivation

In the present study, I argue that meaningful commitment does not resemble controlled motivation (i.e., external regulation and introjected regulation). More precisely, STD authors propose that *introjected regulation* is associated with internal pressure (Deci & Ryan, 2002, Vansteenkiste et al., 2010), which I argue is not the case with meaningful commitment. I have already explained in section 2.8.1, why I believe that meaningful commitment needs human agency. Once again, it is important to mention that Human-Vogel and Rabe (2015), found that self-differentiation predicted meaningful commitment. Self-differentiation is the ability to make rational decisions per own personal standards or values, and to take a firm I-position which is "… a clearly defined sense of self and thoughtfully adhering to personal convictions when pressured by others to do otherwise" (Skowron & Friedlander, 1998, p. 235) (see also section 2.7.2.5). Therefore, I argue that people's future identity goals that inform meaningful commitments, are not based on external expectations but rather what they themselves want to achieve in future. To this end, I specifically refer to possible selves/identities (Markus & Nurius, 1986; Oyserman & Markus, 1991), when speaking about future identity goals and not ought selves (Higgins, 1987) (cf. section 2.7.3.3). Ought selves are the self-descriptions that people develop through socialisation experiences, that tell them how they *should* or *ought* to be as a person (Higgins, 1987), and are not future orientated in nature (Hoyle & Sherril, 2006). Hence, I propose that meaningful commitment is based on future identity goals derived from future orientated possible self descriptions, that people *themselves* select according to their own personal standards and values, indicating lack of internal pressure.

Additionally, I argue that people pursue meaningful commitments because they need to experience identity coherence. One could argue from an SDT perspective, that a need for identity coherence also resembles introjected regulation. More specifically, Ryan and Brown (2003) mention that *introjected regulation* is based on contingent self-esteem evaluations occurring when "… one acts to gain (or avoid losing) self and other regard, rather than to satisfy intrinsic motivation (interest) or fulfil identifications (personal values)" (p. 72). However, as discussed in the previous section (cf. section 2.8.2), it appears as if identity is described as a malleable construct in SDT, and that all situational-based emotional experiences influence identity content. Stated differently, each behavioural decision and its associated emotional experiences (e.g. guilt) have an impact on how one describes oneself. Once again in the present study, I conceptualise identity as a more enduring construct that is only influenced by persistent emotional experiences. For example, a person has the future identity goal of being a successful student, and fails one test. Failure in one test, however, will not necessarily make him abandon his future identity goal of being a successful person, he must persistently experience failure in many tasks. I therefore propose that identity self-descriptions and future identity goals are not as contingent on immediate emotional experiences as introjected regulation. People, who pursue meaningful commitments are, therefore, primarily motivated to engage in meaningful activities to reach future identity goals not to avoid

feeling guilty or like a failure. Said differently, even if they feel guilty or experience failure in one activity, it will not make an immediate difference to what motivated them in the first place, their future identity goals.

In a similar vein, I also propose that meaningful commitment does not resemble *external regulation* (i.e., when people are completely motivated by external contingencies) (cf. section 2.5.2). I argue that people, are not driven by short-term emotional experiences (e.g. reward and punishment) during meaningful commitment, but rather to fulfil their long-term future identity goals. As discussed in section 2.7.3.4, I also differentiate between meaningful identity commitment (i.e., committing to goals because it is meaningful in terms of identity content) and goal commitment (i.e., committing to goals because it is meaningful and identity relevant, *or* for other reasons such as the experience of reward and pleasure). I argue that people who are only motivated by external contingencies, and not future identity goals display goal commitments, but not meaningful identity commitment.

2.8.3.2 Meaningful commitment and autonomous motivation

I also propose that there are conceptual differences between meaningful commitment and autonomous motivation (i.e., intrinsic motivation, integrated and identified regulation). Firstly, I propose that meaningful commitment does not resemble *intrinsic motivation* as defined in SDT. More precisely, it is proposed in SDT that people experience intrinsic motivation when they do things because it is inherently interesting, and not to achieve an outcome separate from the activity itself (cf. section 2.6.4). However, people make meaningful commitments to reach future identity goals, which is an outcome separate from the activity itself. Furthermore, I propose in my conceptual framework (cf. section 2.9.4) that intrinsic motivation occurs as part of lower-level behavioural commitment, while meaningful commitment forms part of higher-level identity commitment. This means that intrinsic motivation influences which short-term behavioural goals people pursue, whereas meaningful commitment has an influence on long-term goal selection.

I also argue that meaningful commitment is conceptually different from identified and integrated regulation. *Identified regulation* occurs when people internalise externally imposed tasks so that they identify and agree with the underlying value of the task, and *integrated regulation* takes place when people are also able to integrate these identifications into all other aspects of the self (cf. section 2.6.5.2). It is therefore, as with meaningful commitment, important for people to feel that the outcome of an externally imposed task is congruent with their values and goals before they can experience identified or integrated regulation (Deci & Ryan, 1985; Pelletier et al., 1997). In the present study, however, I question whether values and goals that SDT theorists refer to necessarily always reflect identity content.

To elaborate, self-concordance in SDT is described as a “state of integrated functioning” (Deci & Ryan, 2000, p. 239) and self-concordant goal selection occurs when people experience autonomous motivation (operationalised as intrinsic and identified regulation) when pursuing their enduring interests and values

(Sheldon & Elliot, 1999) (see section 2.6.4.3 for overview). Sheldon, Prentice et al. (2015), however, recently argued that the theoretical assumption that self-concordant goal selection reflects deep personality-goal fit, has not been directly tested. More specifically, based on McAdams' (1996) conceptualization of personality, as discussed in section 2.7.3.2, personal projects and strivings resemble mid-level personality attributes whilst identity is a deeper-level more enduring personality construct (Bauer & McAdams, 2000; Sheldon et al., 2011). In terms of my conceptual framework, (cf. section 2.9.4), I propose that personal strivings and goals informing self-concordant goal selection and autonomous motivation are, arguably, intermediate-level goals, whilst future identity goals that inform meaningful commitment reflect high-level goals. People may, therefore, have specific personal goals or projects that are presently important to them (e.g. I want to do well in school) and thus experience autonomous motivation, but it is not to say that these personal goals stand for more *enduring* future identity goals (e.g. I want to describe myself as being a successful person in the future) that inform meaningful commitment.

I also propose that autonomous self-regulation influences which behavioural commitments people make, and hence form part lower-level behavioural regulation (cf. section 2.9.4.3). In support of this argument, Vallerand (1997) proposed that autonomous self-regulation occurs on a global (personality), contextual (domain) and situational (state) level (cf. section 2.6.6.4). I use the self-regulation questionnaire, (Ryan & Connell, 1989) to operationalise autonomous self-regulation, and careful consideration of the items suggest that it is based on contextual or situational self-regulation (see appendix 3). In terms of my conceptual framework, I therefore propose that meaningful commitment (i.e., higher-level regulation) has a more long-term influence on behavioural decisions than autonomous motivation (i.e., lower-level regulation) and that not *all* autonomous behavioural pursuits reflect future identity goals. For example, a learner with a future identity goal of being a successful learner, decides one evening that he would rather go to a party than study for an upcoming test. He autonomously makes this decision, and experiences basic psychological need satisfaction in that moment including, relatedness (i.e., caring for friends and friends caring for him), competence (i.e., having the opportunity to display social competence) and autonomy (i.e., he has a say over whether he wants to socialise or not). He also understands the personal relevance of going to the party, because even though it does not necessarily relate to the aspiration of doing well in school, it does relate to the aspiration of being popular. His autonomous decision to go to a party, therefore, resembles one instance of autonomously motivated behaviour. I argue that his future identity goal to be a successful student will, however, in most instances make him want to study hard on more than one occasion, because he experiences a persistent need for meaningfulness (i.e., coherence, purpose, and significance).

2.8.4 BASIC PSYCHOLOGICAL NEEDS AND MEANINGFULNESS

In the present study, I propose that meaningfulness as a human need influence human motivation (cf. section 2.7.1.4). SDT theorists, however predominantly refer to meaning as (i) an *eudaimonic well-being outcome*, (ii) that meaning is derived through *internalisation* and *intrinsic aspirations (iii)* and that

meaningfulness is not a *basic psychological need* (cf. section 2.6.7). In this section, I discuss how I believe SDT theorists consider coherence purpose and significance and indicate conceptual differences between meaningfulness as conceptualised in SDT literature and in the present study.

SDT theorists, in general, conceptualise and operationalise meaningfulness as a component of psychological well-being (e.g. Bailey & Phillips, 2015; Vansteenkiste et al., 2004; Vansteenkiste, Lens et al., 2005; Weinstein et al., 2011; Weinstein, Przybylski, et al., 2012). Weinstein, Ryan et al. (2012) for instance argue that "…meaning is best understood to be an indicator of wellness" (p. 102), when people feel that their lives are satisfactory or lived well. This conceptualisation of meaning in SDT literature, seems to relate to *significance* evaluations and eudaimonia as discussed in section 2.7.1.3. In the present study, however, I argue that meaningfulness not only resemble perceived significance of life and result in psychological well-being, but also influences the type of goals that people select and how motivated they feel to pursue these goals. More precisely, I argue that people commit to specific meaningful and significant goals as influenced by purpose in order to experience coherence in life.

Weinstein, Ryan et al. (2012), also acknowledge that people experience meaning in life when pursuing life *purposes*. Weinstein, Ryan et al. (2012), however, refer to purposes and aspirations in an interchangeable manner, and argue that only intrinsic aspirations (i.e., purposes) lead to psychological well-being (cf. section 2.6.7.3). Once again, I argue that purpose and aspirations (or personal goals) represent two related, but separate constructs (e.g. McAdams, 2012; McKnight & Kashdan, 2009). More specifically, I propose that purpose as a central, self-governing life aim informs which goals or aspirations people choose, and that aspirations or goals are concerned with short-term or context specific outcomes, while purpose relates to long-term outcomes (McKnight & Kashdan, 2009). I therefore argue that purpose and the future identity goals that flow from it, have a more long-term influence on behavioural decisions than aspirations.

SDT theorists, furthermore, argue that internalisation gives a sense *coherence* (cf. section 2.6.7.2). In the present study, however, I concur with several authors, who propose that there are different levels of coherence (cf. section 2.7.1.1), and I argue that internalisation in SDT provides lower-level coherence (i.e., coherence between day to day behavioural decisions, based on personal goals), but not necessarily higher-level coherence as facilitated by meaningful commitment (i.e., coherence between future identity goals and behavioural decisions). I argue that one should consider both the effects of lower and higher-level coherence on motivation, to obtain a complete understanding of long-term motivated behaviour.

For example, SDT theorists in the education domain, stress the importance of giving learners a meaningful rationale in an autonomy supportive manner, during uninteresting learning activities so that they can experience internalisation (e.g. Deci et al., 1994; Jang, 2008, Niemiec & Ryan, 2009; Reeve, Jang, Hardre & Omura, 2002). Jang (2008) for instance, included 136 college students in her sample, to investigate the influence of a meaningful rationale on internalisation, interest, behavioural engagement, and conceptual learning, during an uninteresting class on statistical procedures. The meaningful rationale was designed to "… (a) enable the participant to perceive the activity as important

enough to become worth one's effort and (b) help the participant make a connection between the activity and a personal goal (i.e., gaining a useful skill in the present study)" (Jang, 2008, p. 810). Jang (2008) did not want to find out whether the aforementioned meaningful rationale had a long-term influence on behavioural engagement levels, and I question whether the rationale would have in fact had a long-term influence on engagement levels. More specifically, I propose that the rationale offered by Jang (2008) speaks to personal goals (i.e., gaining useful skills) that create low-level coherence, but not necessarily future identity goals (e.g. I want to be a life-long learner), that create high-level coherence (cf. section 2.7.3.2). Simply put, the participants might have wanted to acquire statistical skills in the moment for an array of reasons (e.g. impressing lecturer, receiving reward, wanting to feel good about oneself on the day), that would have been applicable to that specific situation (i.e., short-term coherence). However, I propose these participants will only want to continue learning about statistics or broaden their statistical knowledge in the future, if doing so resonate with their future identity goals (i.e., long-term coherence), as facilitated by meaningful commitment.

SDT theorists also do not consider meaningfulness as a *fundamental* (Sheldon et al., 2001) nor *basic psychological need* (Weinstein, Ryan et al., 2012) even though other authors propose that meaningfulness is an important human need (e.g. Andersen et al., 2000; Baumeister, 1991; Frankl, 1978; Heine et al., 2006). In section 2.6.7.5, I discussed a study by Sheldon et al. (2001) in which the authors considered whether 10 specified human needs are fundamental or not. One of these needs termed "self-actualisation meaning", was described as "feeling that you are developing your best potentials and making life meaningful rather than feeling stagnant and that life does not have much meaning" (Sheldon et al., 2001, p. 339). Sheldon et al. (2001) reported that only autonomy, competence, relatedness and, interestingly enough, self-esteem were fundamental needs, while self-actualization meaning was not. However, I argue that the conceptualisation of self-actualisation meaning as put forth by Sheldon et al. (2001), included purpose (i.e., "feeling like you are reaching your best potentials) and significance (i.e., "life having meaning"), but not necessarily coherence. One could argue, that the exclusion of coherence as part of meaning as a need in the Sheldon et al. (2001) study, could have had an impact on whether participants felt that meaningfulness was a fundamental need or not.

Weinstein, Ryan, et al. (2012) moreover, also argue that meaningfulness is not a basic psychological need, because there is no specific content associated with meaningfulness that leads to optimal human functioning and integration. Instead, they propose that meaningfulness, as far as resembling psychological well-being, is the result of basic psychological need satisfaction (Weinstein, Ryan et al., 2012). As mentioned earlier, I argue that meaningfulness is not only associated with psychological well-being, but also influence goal choice and motivation. Therefore, I argue that the experience of coherence, purpose, and significance when pursuing meaningful future identity goals resemble the necessary conditions for meaningfulness, which in turn leads to optimal human functioning, integration and coherence.

In the present study, I do not investigate whether meaning is a basic psychological need, because my sample is not large or representative enough to make such inferences. I do however tentatively argue

that meaning and coherence are innate and universal needs. More specifically, I argue that meaningfulness (i) is critical throughout life, (ii) that the extent to which people benefit from meaningfulness is not always dependent on conscious processing and (iii) it is universally necessary for optimal wellbeing (Vansteenkiste et al., 2010) (cf. section 2.6.2). Several authors have for instance argued that people, regardless of their age, culture, or gender need to feel that their lives are coherent, or form part of a predictable pattern (Antonovsky, 1987; Heine et al., 2006; Sommer et al., 2012). As mentioned before, it is noticeable in psychosocial developmental theory (Erikson, 1968), that people throughout their lives (i.e., from trust vs. mistrust to ego integrity vs. despair) consider their place in the world and if this understanding forms a coherent pattern. Said differently, even infants experience a need for coherence in their lives and it therefore makes sense why several authors have already proposed that people are motivated on an unconscious level to support coherence (e.g. Baumann & Kuhl, 2002; Bowers et al., 1990). Moreover, some authors seem to propose that the need for coherence is universal (e.g. English & Chen, 2007; Heine et al., 2006), with cultural differences in how coherence is facilitated (Suh, 2002).

2.8.5 GOAL CONTENT

It appears that meaning in life and identity-based theorists, unlike SDT theorists, generally do not consider the impact of goal content differences on motivation and well-being outcomes. I utilise a cybernetic approach to self-regulation as part of my conceptual framework (see section 2.9.4) and Deci and Ryan (2000) acknowledge that cybernetic approaches to motivation (Carver & Scheier, 1998), are useful to understand how hierarchical motivation may occur, but caution about a lack of goal content differentiation. For example, Deci and Ryan (2000), say “that what lies at the top of goal hierarchies is not organismically determined” (p. 259), meaning that higher-order goals are not always reflective of human pursuits of growth, well-being and integration (Deci & Ryan, 2000). SDT theorists, therefore, argue that not all higher-order identity goals are intrinsic, which in turn influence the extent to which people experience basic psychological need satisfaction (cf. section 2.6.4).

In the present study, I do not investigate whether future identity goals are intrinsic or extrinsic, but tentatively argue that future identity goals are intrinsic in nature. Firstly, I concur with Carver and Scheier (2000), who argue that higher-order identity related goals are organismically determined, because the pursuit thereof create a sense of coherence or integration through discrepancy feedback loops, and that the experience of coherence in turn facilitates psychological well-being and growth. Secondly, as I have discussed before, meaningful commitment is associated with self-differentiation (Human-Vogel & Rabe, 2015) which implies that the future identity goals that people pursue during meaningful commitment, are based on what people want to achieve themselves (i.e., inwardly focussed) and not what others expect of them (i.e., outwardly focussed). Lastly, Ryan et al. (2008) mention that intrinsic goals are usually first order goals, meaning that they are not reducible to other secondary goals. I argue that future identity goals as high-level construct in my hierarchical self-regulatory conceptual framework, cannot be deduced

to other goals. These arguments, however, remain tentative because I do not consider whether higher-order identity goals are intrinsic or extrinsic in this study.

2.9 CONCEPTUAL FRAMEWORK

In this section, I first give an overview of self-regulation, the influences of time constraints on self-regulation and motivation and then *specifically discuss the conceptual framework of this study in section 2.9.4*.

2.9.1 SELF-REGULATION

A broad definition of self-regulation includes all the efforts of the self (behaviourally, emotionally, or cognitively) to regulate the self (Hofer, Busch & Kartner, 2011). Self-regulation is usually conceptualised and investigated in terms of self-regulated learning (Schunk & Zimmerman, 1998), social cognition (Bandura, 1989), emotional self-regulation (Sonnetag & Barnett, 2011) or personality development (Baumeister, Gailliot, De Wall & Oaten, 2006). In the present study, I focus how self-regulation affects motivation. I concur with Carver and Scheier (2011) and Lord et al. (2010) who propose that self-regulation is a future orientated endeavour, in which people engage in a series of purposeful processes and self-corrective adjustments, to reach a specific future outcome.

Carver and Scheier (1982), as influenced by Powers, (1973) and Vallacher & Wegner (1987) utilised a cybernetic approach to self-regulation in the psychological domain. Carver and Scheier (1982) argue that people's movement toward, or away from goals are influenced by a feedback loop, where people compare goals with reference values (e.g. a positive future outcome). More specifically, a discrepancy-reducing *negative* feedback loop occurs, when there is discrepancy between goals and a reference value, after which the individual acts (i.e., select new goals) to reinstate a level of homeostasis (Carver & Scheier, 2011). *Positive* discrepancy increasing loops, also have an impact on motivation when people avoid short-term attractive goals, to reach favourable future outcomes (Carver & Scheier, 2003). In other words, individuals choose goals to reach future outcomes, and they adapt their behaviours and goals should they feel that it does not correspond with a self-defined positive future outcome.

Carver and Scheier (1982, 2011) moreover, argue that goals form a hierarchy of abstraction including, (i) *sequences* (basic motor actions to complete a task), (ii) *programmes* (planned actions directing actions) and (iii) *principles* (values directing choices regarding sequences and programmes or self-content). Principles, therefore, refer to abstract "being" goals, whereas programmes and sequences are concrete "do" goals, or the actual behavioural fulfilment of "being" goals (Carver & Scheier, 2003). Principles or higher level goals therefore resemble a reference point in a negative feedback loop, that influence more concrete lower level goals (i.e., programmes) (Carver & Scheier, 2011).

2.9.2 SELF-REGULATION AND TIME CONSTRAINTS

Several authors in the past have criticised the mechanistic nature of a cybernetic approaches to self-regulation, because it does not take human agency and forethought into consideration, nor considers the influence of external role players on motivation (e.g. Bandura and Locke, 2003; Locke, 1991; Sheldon et al., 2011). Lord et al. (2010) utilised earlier work by Carver and Scheier (1982), and developed a self-regulatory approach to motivation in the career domain, that in many regards addresses the aforementioned concerns. More, specifically, Lord et al's. (2010) model differs from the Carver and Scheier model by: (i) stating that self-regulatory processes move through various intra- and interpersonal phases in which both external role players or individuals themselves influence self-regulation, (ii) considering the influence of time constraints on self-regulation and proposing that higher-order goals place a long-term constraint on intermediate and lower level goals, (iii) considering how future possible selves influence hierarchical motivation and finally (iv) proposing an additional hierarchical level referred to as micro level regulation that includes affective experiences during self-regulation.

Lord et al. (2010), propose a "top-down" hierarchical approach to motivation, where higher-order self-regulation has an enduring influence on intermediate, lower, and micro levels of self-regulation. *High-level regulation* includes a person's organised self, including self-descriptions and possible future self-evaluations, as influenced by other individuals over a long time (e.g. upbringing by parents), and place long-term self-related constraints on intermediate and lower-level goal selection (Lord et al., 2010). *Intermediate-level* regulation concerns conscious and unconscious goal choice and adaptation, and is influenced by both self-descriptions contained in higher-level regulations and feedback from others (e.g. teachers) during task completion. (Lord et al., 2010). *Lower-order* self-regulation involves task behaviours to fulfil intermediate and higher-level goals and occur in "real time" and at a quicker pace than intermediate and higher-level regulation (Lord et al., 2010). *Micro-level* regulation involves the working memory that is involved with task completion as well as its accompanying physiological responses (e.g. dopamine and serotonin) influencing motivation (Lord et al., 2010).

2.9.3 SELF-REGULATION AND MEANINGFUL ACADEMIC COMMITMENT

Human-Vogel and Rabe (2015) utilised facets of Lord et al's., (2010) self-regulatory approach, to conceptualise academic commitment. They differentiate between (i) identity-related commitment (i.e., high-level regulation), (ii) goal commitment (i.e., intermediate-level regulation), (iii) task commitment (i.e., low-level regulation) and (iv) physiological commitment (i.e., micro-level regulation). Human-Vogel and Rabe (2015) like Lord et al. (2010), therefore, argue that hierarchical differences influence self-regulation, and that higher-level identity commitments place a constraint on lower-level commitments. Said differently, identity commitments (e.g. I am a responsible person) have an enduring or long-term influence on goal commitment (e.g. I want to do well in this test) and behavioural commitments (e.g. I want to study hard). Human-Vogel and Rabe (2015), also, argue that lower-level goal commitments produce immediate emotional satisfaction (e.g. pleasant affect) whilst higher-level identity commitments offer meaningfulness (also see section 2.7.3.4). Meaningful commitment, therefore, relates to

"commitments [that] were experienced as reflective of the self and consistent with self-expression" (Human-Vogel & Rabe, 2015, p. 4).

2.9.4 CONCEPTUAL FRAMEWORK FOR THE PRESENT STUDY

SDT theorists criticize cybernetic approaches of self-regulation for, amongst other things, not considering the effects of basic psychological needs and internalisation on motivation (Deci & Ryan, 2000, Sheldon et al., 2011). I concur, it seems necessary to include basic psychological needs and internalisation in a self-regulatory framework, given the large amount of literature that indicates the importance thereof for positive academic and well-being outcomes (cf. section 2.6). In the present study, I utilise a conceptual framework as illustrated in figure 2.3 on the following page. In essence, I use a hierarchical framework of self-regulation, as proposed by the authors mentioned previously (Carver & Scheier, 1982; Human-Vogel & Rabe, 2015; Lord et al., 2010), and include basic psychological need support and satisfaction, autonomous self-regulation, and perceived competence as additional SDT variables.

2.9.4.1 Higher-level identity commitment

In the present study, I argue that higher-level abstraction occurs over a long time (e.g. months and years) (Human-Vogel & Rabe, 2015; Lord et al., 2010), and involves higher-level meaning-making (Baumeister, 1991; Schnell, 2009) (see also section 2.7.2.3), because people consider their life purposes, how they describe themselves presently (i.e., identity self-descriptions) and how they would like to describe themselves in the future (i.e., future identity goals). I propose that identity self-descriptions fulfil a self-regulatory function, by influencing which academic and behavioural goals learners commit to, in order to realise *future* identity goals and experience a sense of *coherence* (cf. section 2.7.4).

Gr 11 and 12 learners consider how they would like to describe themselves presently and in the *future* (see section 2.7.7.3)., and are therefore motivated to attain future possible selves (Markus & Nurius, 1987) and select and commit to future identity goals. (e.g. I want to be a successful student or sport person or socialite). Adolescents value specific future identity goals more than others, due to prior socialisation experiences and perceived ability (see section 2.7.3.3). Future identity goals, importantly, have a long-term and persistent influence on academic and behavioural goal selection because it is different from day-to-day goals (e.g. "I want to solve this mathematics problem"). Put differently, the lack of a definite attainment level for identity goals, leads to a perpetual need to engage in self-symbolising (Gollwitzer et al., 2012) where individuals seek to accumulate behavioural proof, or choose goals or behaviours that resemble future identity goals.

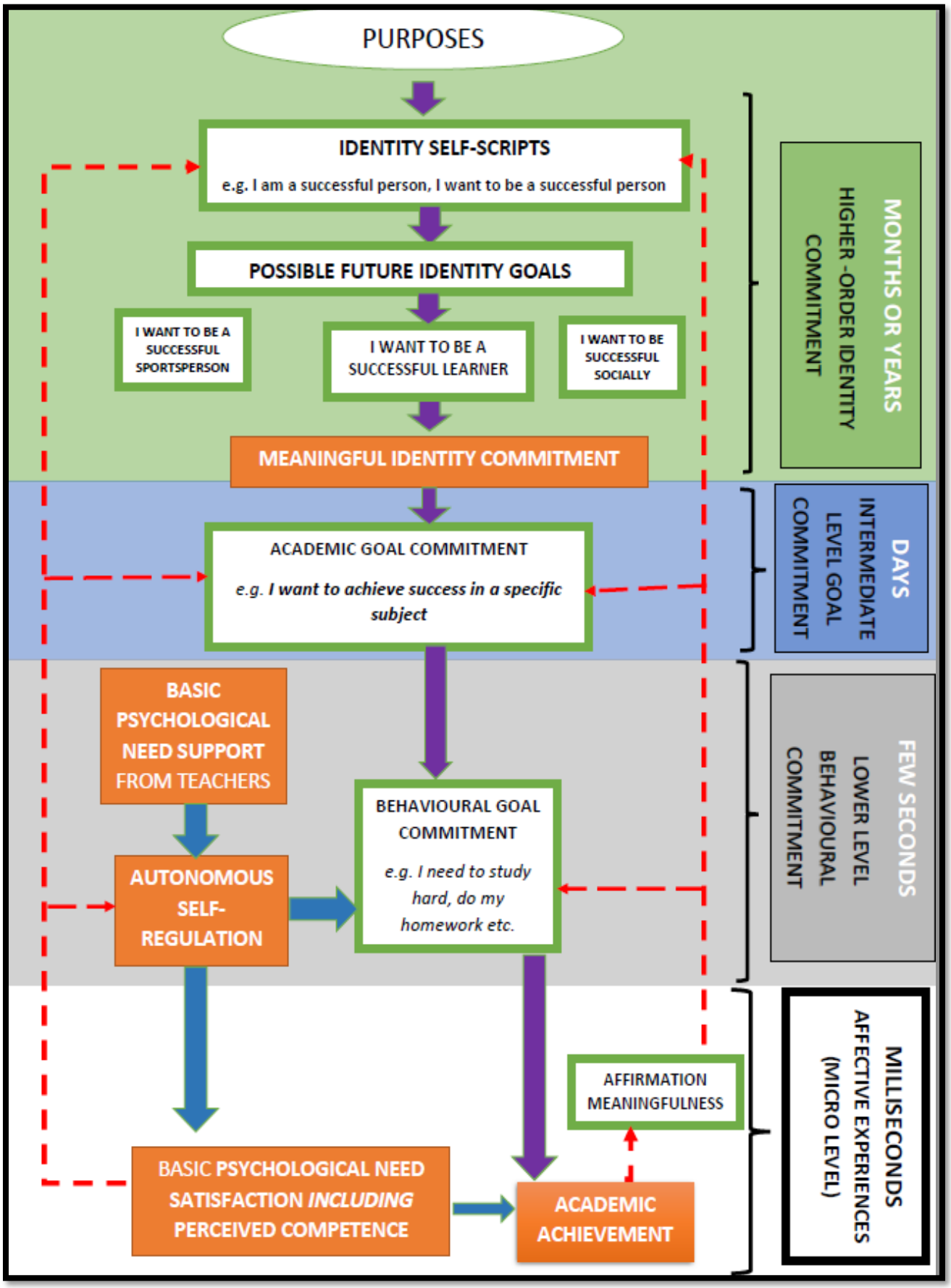

Figure 2.3: Conceptual framework

Learners also select and stay committed to future identity goals to maintain a sense of *coherence*. As mentioned before, a successful outcome of identity development is the formation of identity that offers a stable description of oneself across time and in different situations (Erikson, 1968) (cf. section 2.7.2). Learners, therefore, commit to meaningful intermediate and lower level goals that reflect their identity self-descriptions, to experience a sense of higher-level coherence (cf. section 2.7.1.1). Adolescents are, moreover, motivated to maintain a sense of coherence via meaningful commitments, because a failure to do so leads to perceived threat (Vignoles et al., 2011) and general poor psychological well-being (North & Swann, 2009).

Lord et al. (2010) furthermore argue that environmental input such as demands and support from other individuals influence higher-level self-regulatory processes over a longer period, by influencing identity content. In the present study, I propose that *persistent* exposure to perceived basic psychological support and consequent need satisfaction in academic environments, help learners to feel that their future identity goals are plausible. Learners have plausible possible selves, when they believe that they are able to attain possible future selves because they have necessary strategies in place to do so (Oyserman et al., 2006). Oettingen et al. (2009), similarly, argues that people display higher levels of future goal commitment when they feel that the feasibility is high of reaching their goals. I propose that learners develop expectancy beliefs about whether they will receive need support in learning environments or not based on previous experiences of need support. I argue that these expectancy beliefs influence the extent to which learners think that they will be able to successfully engage in goal and behavioural commitments in learning environments, thus affecting meaningful commitment levels.

I specifically argue that basic psychological need satisfaction and support have a long-term influence on meaningful commitment (as shown by red arrows in visual representation), because the experience of need satisfaction takes place during micro level regulation (see section 2.9.4.4) and need support during lower-level regulation (see section 2.9.2). In other words, lower levels of need support during one academic behavioural task does not necessarily make learners believe that they will not receive need support in future. However, persistent or long-term experiences of poor psychological need support from teachers, could make them believe that they will not necessarily receive psychological need support from other teachers in academic environments in future, which in turn make them question whether their future identity goals are feasible or plausible, leading to a decrease in meaningful commitment levels.

2.9.4.2 Intermediate-level academic goal commitment

Intermediate-level abstraction occurs over hours and days (Lord et al., 2010), when learners commit to specific academic goals (e.g. I want to achieve success in a specific subject) that are meaningful in terms of their future identity goals (e.g. I want to be a successful student). There are of course several other intermediate goals that learners may also want to commit to (e.g. being the most popular person in school, being a provincial hockey player or achieving academic success). However, I argue that learners will prioritise commitment to academic goals, if their future identity goals relate to academic performance (Miller & Brickman, 2004; Hoyle & Sherrill, 2006). Some learners may however have negative identity

self-descriptions, that may have an adverse effect on academic goal commitment. Learners could for instance have a negative future self-description (e.g. “I am an underachiever”) which might lead to lower levels of academic goal commitment. In support of this, earlier investigations have shown that negative possible selves and self-scripts (e.g. stereotypes) have a negative impact on academic achievement (e.g. Kao, 2000; Honora, 2002).

In addition, I propose that learners with an underdeveloped identity due to unsuccessful identity development, may also find it difficult to make meaningful academic goal commitments. For example, a learner does not have a clear idea of who she wants to be in the present and in the future (i.e., identity self-descriptions and future identity goals) and consequently commits to academic goals to impress her parents or, commit to all potential competing intermediate goals (e.g. being class president, being a professional hockey player, being a top student) equally for short periods of time, to impress other people. I argue that this learner is experiencing goal commitment without identity commitment, because her commitment to goals are not meaningful or identity relevant (see section 2.7.3.4). People that engage in goal commitments that are not identity relevant, usually do so to experience an immediate reward or positive affect (e.g. my parents like me) (Human-Vogel & Rabe, 2015) which in turn lead to or a lack of persistence in behavioural goals, because immediate rewards are not always present.

2.9.4.3 Lower-level behavioural goal commitment

Lower-level abstraction includes the behavioural commitments that people make over a short time (i.e., seconds or minutes) (Lord et al., 2010). In the present study, behavioural commitment refers to the learner’s commitment towards academic tasks (e.g. studying for tests, completing assignments, taking part in classroom activities), which have also been referred to as student engagement elsewhere in literature (Kuh, 2009; Schlechty, 1994). A learner is influenced by a future identity goal, stipulating that he wants to be a successful student in the future, therefore, commits to an academic goal of being successful in school and consequently, commit to the behavioural goal of studying hard. The learner is therefore engaged in self-symbolising practices (Gollwitzer et al., 2012) to experience future identity goal realisation.

Many learners, however, do not commit to behavioural goals even though they are perceived as meaningful. Teachers might for instance ask a learner that is afraid of public speaking, to so an oral presentation. It is important for her to do the presentation, because it will help her reach the intermediate level goal of being successful in a subject, and the future identity goal of being a successful learner. However, she may feel that her presentation will be a unsuccessful because of her fear of public speaking, which is in disagreement with her original identity self-description of being a successful individual, and as a consequence lead to lower levels of behavioural commitment (i.e., not wanting to do the presentation).

In other words, externally imposed tasks could have a negative impact on behavioural commitment levels. In the present study, I argue that basic psychological need support from teachers as well as learner's experience of autonomous self-regulation, may help them to meaningfully commit to externally imposed behavioural tasks. The learner discussed previously could therefore still decide to do the presentation higher when she: (i) feels like teachers gave her the opportunity to choose whether she wanted to do the speech or not (i.e., *autonomy* support), (ii) her teachers gave her enough guidelines and structure on how to do the speech successfully (i.e., *competence* support) and (iii) her teachers are emotionally supportive (*relatedness* support). I also propose, following SDT, that the learner will experience autonomous self-regulation when receiving basic psychological need support, which will also increase her behavioural commitment levels.

As discussed in section 2.8.3.2, I argue that autonomous self-regulation, as operationalised in the present study, occurs on a behavioural and not a higher-order self-regulatory level. People experience autonomous self-regulation when they agree with and identify with the outcome of an externally imposed task (cf. section 2.6.4.2). In a similar vein, people make meaningful behavioural commitments when they feel that behaviour aligns with their future identity and academic goals. However, in the present study, I propose that the future identity goals that influence meaningful commitment have a more enduring influence on motivation than the personal goals that influence autonomous self-regulation (see sections 2.8.2, 2.8.3). I therefore argue, that learners will experience higher levels of autonomous motivation, when they also experience meaningful commitment, that is, when they feel that an externally imposed task is not only related to personal goals (e.g. being successful during this public speaking task) but also future identity goals (e.g. I want to be a successful person) (see also chapter 5, section 5.2.4).

2.9.4.4 Micro-level physiological commitment

Micro-level physiological commitment occurs over a very short period of time (i.e., milliseconds), and includes, (i) the regulation of physiological responses to complete tasks and (ii) emotional experiences during task behaviours (e.g. joy, happiness, satisfaction or disappointment) that affect self-regulatory efforts (Human-Vogel & Rabe, 2015; Lord et al., 2010). Micro-level regulation therefore occurs over a shorter period of time than higher-level regulation, meaning that emotional experiences during micro-level regulation have a more immediate influence on lower-level self-regulation (i.e., behavioural commitments), than higher-order identity content (i.e., future identity goals) (as shown by red dashed line in figure 2.3). For example, experiencing failure in *one* test, does not necessarily imply that the learner will start describing herself as an unsuccessful person in the future. Yet, the cumulative effect of persistent emotional experiences might have an effect higher-order identity content (e.g. if the learner *persistently* fails tests in a specific subject, then she might reconsider her identity self-descriptions after some time).

In a similar vein, I argue that the experience of basic psychological need satisfaction (i.e., the experience of autonomy, competence, and relatedness) also occurs on a micro-level, when learners receive need

support from teachers during behavioural pursuits. I argue that the immediate experience of need satisfaction during tasks, promotes autonomous self-regulation during lower-level behavioural commitment, as indicated in SDT literature (cf. section 2.6.5), while the cumulative or persistent experience of need satisfaction in academic environments have a long-term impact on higher-level meaningful commitment (cf. section 2.9.4.1).

Perceived competence, furthermore, also occurs as part of micro-level self-regulation. Diefendorff and Lord (2008) for instance explain that higher levels of dopamine are released when people expect that they will be successful, which in turn leads to higher levels of behavioural engagement. Similarly, a decrease in dopamine occurs when one expects that one will be unsuccessful which leads to avoidance behaviours (Diefendorff & Lord, 2008). I therefore propose that learners with higher levels of perceived competence will approach and commit to behavioural goals more readily than learners who do not feel competent.

I also argue that the experience of academic achievement forms part of micro-level self-regulation. More precisely, academic achievement serves as a confirmation that earlier self-regulatory efforts (i.e., behavioural, and academic goal commitment) have been effective, which in turn increase motivation for subsequent endeavours. One instance of academic achievement, like all other micro-level processes, however do not have an immediate impact on higher-order identity content (i.e., feeling that one has reached future identity goals). Learners therefore, as mentioned in section 2.9.4.2, persistently choose goals and behaviours to experience academic achievement, to reach future identity goals. Higher-order long-term identity content, in addition, has an impact on micro-level regulation. For example, academic achievement will only be perceived as meaningful outcome when it aligns with the future identity goal of being a successful student. Another learner may, for instance, place more emphasis on the future identity goal of being a successful sportsperson, which may limit the extent to which academic achievement motivates subsequent behaviour.

I also propose that higher-order identity content may influence the amount of basic psychological need satisfaction that learners experience. To elaborate, autonomous self-regulation is usually accompanied by higher levels of basic psychological need satisfaction (Deci & Ryan, 2000). As mentioned in the previous section, I propose that meaningful commitment increases the likelihood of experiencing autonomous self-regulation. Thus, I propose that higher levels of autonomous motivation as, influenced by meaningful commitment will lead to higher levels of basic psychological need satisfaction (see also chapter 5 section 5.2.3.4).

2.10 CONCLUSION

In this chapter, I first gave an overview of existing literature on academic achievement by South African learners. I argued that academically resilient learners display higher levels of motivation and proposed that SDT and meaningful commitment as motivational theories, in particular, could be used to understand

how and why South African learners feel motivated. I then discussed some conceptual differences between meaningful commitment and SDT, after which I discussed my conceptual framework. In the next chapter, I discuss the methodological steps that were taken in the present study to test my hypotheses and answer my research questions.

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Chapter 3
Research Design and Methodology

3.1 INTRODUCTION

Chapter 3 contains a description of the research design of the present study, including the research questions and hypotheses as informed by two hypothesised models. I also include a discussion of data collection procedures that occurred over two phases, sample parameters and size, and the scales that were used to operationalise constructs. I then present a discussion of the descriptive and inferential data analysis strategies that were followed to answer my research questions and test my hypotheses.

3.2 RESEARCH PARADIGM

Paradigmatic assumptions resemble the basic belief system or worldview of the researcher, which informs his or her research practices (Creswell, 2003; Denzin & Lincoln, 1994; Maree, 2007). My assumptions regarding reality (ontological perspectives), how I see my association with knowledge (epistemological perspectives), and how I think I can generate knowledge (methodological considerations) align with the paradigmatic assumptions of critical realism (Guba & Lincoln, 1994).

It is proposed in critical realism, a post-positivism paradigm that research endeavours exist between positivism and constructivism paradigms (Bhaskar, 1978). Critical realism as a research paradigm was developed to address perceived limitations of both realist and anti-realist approaches (Groff, 2013). Critical realists argue that realist approaches (aligned with positivism) do not take the ambiguous nature of reality into consideration; and that anti-realist approaches (aligned with interpretivist paradigms) place too much emphasis on the subjective nature of reality, and thus negate any universal truth Guba & Lincoln, 1994). While positivism therefore acknowledges a single measurable reality and constructivist-interpretive approaches embrace multiple realities, critical realists argue that multiple perspectives of a single, mind-independent reality exist (Bisman, 2010).

More specifically, critical realists' ontological assumptions describe reality as being stratified and that it exists on three levels: (i) *the empirical level*, which includes all events that *can* be experienced; (ii) *the actual level,* including all events that *are* experienced; and (iii) the *causal level,* which includes all unseen causal mechanisms that influence events (Bisman, 2010). Accordingly, I acknowledge the limitations of my understanding of the present research phenomena (by virtue of including a limited number of variables and excluding other confounding variables such as IQ and aptitude) in my interpretations of my results, and recommend or will conduct future applicatory investigations that include additional variables.

Epistemologically, critical realists propose that objectivity, although difficult to implement, remains an ideal (Guba & Lincoln, 1994). Critical realists acknowledge the flexible nature of human perception and mention that differences exist between reality and perceptions of reality. They propose that reality extends beyond one's self or awareness and that it is not wholly known or understandable (Wuisman, 2005). Houston (2010) shows that all three levels of reality are influenced by social constructions and the evaluations of individuals when they interact with the world. Critical realists contend that there is an intransitive world that is real and a transitive world that is informed by theories and perceptions that we develop about the intransitive world (Houston, 2010). As our theories and perceptions become more refined, the transitive world moves closer to the intransitive world, albeit never to be in direct relation to it. Researchers are therefore not value-free or value-laden in critical realism investigations, but are encouraged to be cognisant of how their values influence their research efforts (Houston, 2010). Critical realists often use "external guardians of objectivity" (Guba & Lincoln, 1994, p. 110) to monitor their level of probable objectivity. Critical realists accordingly establish whether findings correspond with existing knowledge as well as the opinions of critical community (e.g. other scholars) (Guba & Lincoln, 1994).

I therefore stayed aware of my own value system and how it might have influenced my thoughts about the research phenomena during the data collection and analysis phases. I remained cognisant of the fact that my conceptualisation of the associations between the constructs in the present study was informed by my own perceptions of the research phenomena, and ensured that scientifically rigorous procedures were followed in my research design in order to obtain valid and observable findings. I also ensured that I compared the findings from the present study to existing literature and theoretical assumptions in an attempt to consult "external guardians of objectivity" to promote my own levels of objectivity.

Methodologically, critical realists propose that researchers and participants are active participants in creating and understanding research through their interactions with reality (Krauss, 2005; Wuisman, 2005). The critical realist paradigm is therefore applicable to the present study because participants are perceived as active meaning makers in their educational environments through their own self-regulatory efforts. Critical realists emphasise the importance of critical multiplism when testing hypotheses, due to the stratified nature of reality and researchers' limited capacity for objectivity (Guba & Lincoln, 1994). I therefore, ensured that I implemented critical multiplism by (i) using more than one theoretical position in attempting to understand the research phenomena; (ii) collecting data on more than one occasion; and (iii) using multiple research instruments in order to understand the research problem (Bisman, 2010).

3.3 CONSTRUCTS INVESTIGATED AND OPERATIONALISED IN THE PRESENT STUDY

I investigated the association between constructs found in SDT (Deci & Ryan, 2000) and academic commitment theory (Human-Vogel & Rabe, 2015) as independent variables, and academic achievement as a dependent variable. More precisely, I used the meaningfulness subscale of the academic commitment scale (Human-Vogel & Rabe, 2015) to operationalise the extent to which learners felt that

their academic goal and behavioural commitments was reflective of their identity. I also used several research instruments based on SDT to operationalise the influence of contextual need support by teachers as well as learner's autonomous self-regulatory efforts on academic achievement. I used: (i) the academic climate questionnaire (Williams & Deci, 1996) to operationalise perceived psychological need support by teachers; (ii) an adapted version of the treatment self-regulation questionnaire (Ryan & Connell, 1989) to operationalise autonomous self-regulatory efforts by learners; (iii) the perceived competence scale (Williams & Deci, 1996) to operationalise the level of perceived competence levels of learners and (iv) an adapted version of the basic need satisfaction scale in relationships (La Guardia et al., 2000) to operationalise the extent to which learners feel that their basic psychological needs are satisfied

3.4 RESEARCH OBJECTIVES OF THE PRESENT STUDY

The primary objective of the present study was to investigate two *separate* hypothesised models. I created the first model, based on SDT theoretical assumptions (i.e., model 1) to test the validity of a SDT motivational model in a South African sample and a second model (i.e., model 2), to explore whether meaningful commitment could compete with autonomous self-regulation in predicting academic achievement.

3.5 HYPOTHESES AND RESEARCH QUESTIONS

3.5.1 MODEL 1 – RESEARCH QUESTION AND ACCOMPANYING HYPOTHESES

❖ **Research Question 1**

Do autonomous self-regulation and perceived competence mediate the association between need support and academic achievement?

❖ **Hypotheses**

- H_1: Need support will predict academic achievement.
- H_2: Need support will predict autonomous self-regulation.
- H_3: Autonomous self-regulation will predict perceived competence.
- H_4: Perceived competence will predict academic achievement.
- H_5: The strength of the association between need support and academic achievement will be reduced when accounting for autonomous self-regulation and perceived competence as mediators.

3.5.2 MODEL 2 – RESEARCH QUESTION AND ACCOMPANYING HYPOTHESES

❖ **Research Question 2**

Does need satisfaction mediate the associations that both meaningful commitment and autonomous self-regulation have with academic achievement?

❖ **Hypothesis**

- H_6: Meaningful commitment will predict academic achievement.
- H_7: Need satisfaction will mediate the association between meaningful commitment and academic achievement.
- H_8: Autonomous self-regulation will predict academic achievement.
- H_9: Need satisfaction will mediate the association between autonomous self-regulation and meaningful commitment.
- H_{10}: Meaningful commitment and autonomous self-regulation will be correlated.

❖ **Research Question 3**

Is there a difference in strength in the association between meaningful commitment and academic achievement and autonomous self-regulation and academic achievement?

3.6 OPERATIONALISED PREDICTOR MODELS

The hypotheses presented in section 3.5 are illustrated in figures 3.1 and 3.2, displaying the operationalisation of constructs.

3.6.1 MODEL 1

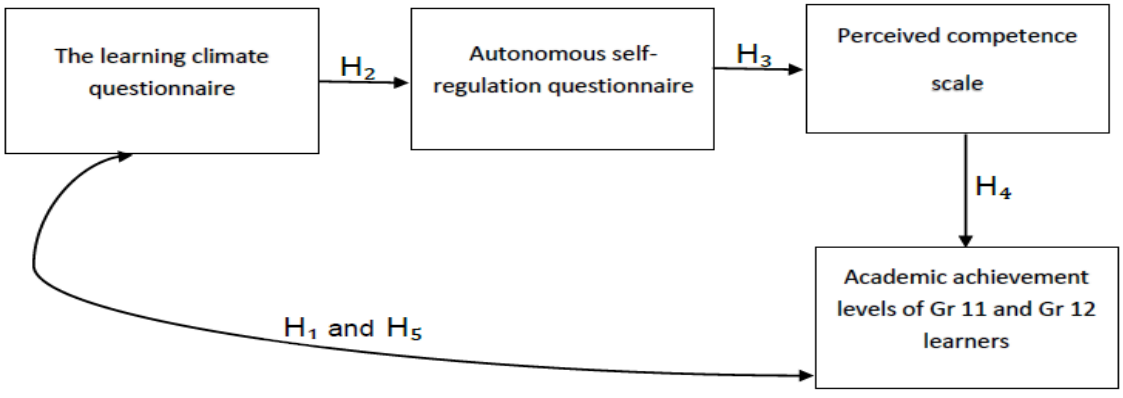

Figure 3.1: Operationalised model 1

3.6.2 MODEL 2

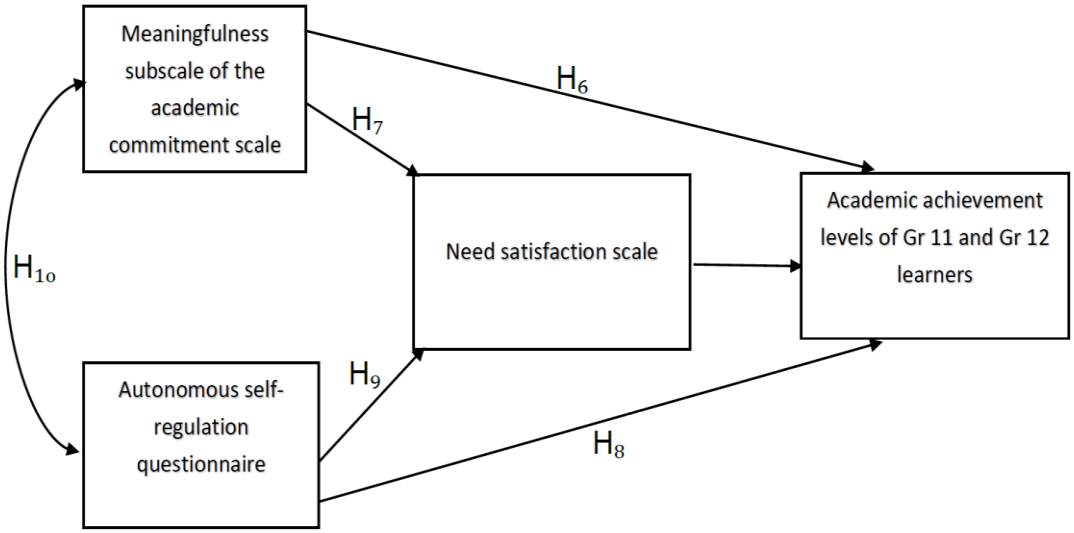

Figure 3.2: Operationalised model 2

3.7 RESEARCH DESIGN

3.7.1 RESEARCH APPROACH AND DESIGN CONSIDERATIONS

I used a quantitative research approach with an accompanying non-experimental, prospective correlational design to plan and conduct my research activities to answer my research questions (Reis & Judd, 2014). I collected numerical data on operationalised constructs (need support, meaningful commitment, autonomous self-regulation, perceived competence, and basic need satisfaction) to investigate predetermined hypotheses (detailed in section 3.5) (Muijs, 2011). The present research design is non-experimental because the independent variables were observed as they occur "naturally" (Cohen et al., 2007). The prospective nature of the present study implies that the independent and dependent variables are measured on two different occasions (see section 3.7.4), which in addition allowed me to include several independent variables and participants.

An important limitation of a quantitative-based non-experimental correlational prospective design is that I was precluded from obtaining in-depth or contextually rich findings from each individual participant, as would be the case in a qualitative design (Muijs, 2011). An additional limitation concerns my inability to establish causality, because even though it is assumed that an association between independent and dependent variables exists and temporal differences in data collection are present, I was not able to control for confounding variables, as would be the case in an experimental design (Creswell, 2013). The present investigation is, however, an exploratory study and follow-up qualitative investigations could possibly investigate the in-depth nature of the research phenomena, should the present study demonstrate valid associations between constructs. The exploratory nature of the present study furthermore implies that the determination of causal relationships is not imperative.

Additional potential limitations associated with a non-experimental prospective correlational design include: (i) the potential investment of monetary and time resources during data collection; (ii) possible high attrition levels in participants; and (iii) selection bias (Creswell, 2013; Manolio, et al., 2005). It was, for instance, a pre-emptive concern that I would not be able to measure the dependent variable (academic achievement) of all learners if a participant had left the school before his or her academic achievement could be captured. Selection bias could have occurred if I had only included participants who valued academic achievement in the sample.

I proactively dealt with these concerns before data collection. I dealt with the intensive nature of the research design by planning to collect data over a time span of three months on two separate occasions, which was a manageable way of collecting data. I included additional learners in the sample to proactively deal with potential attrition of participants. I endeavoured to address selection bias by including the majority of learners in a specific grade in a school in my sample in order to include varied sample, including learners who value and do not value academic achievement.

3.7.2 DATA COLLECTION

3.7.2.1 *Sample parameters, sampling procedures and sample size estimation*

I used a non-probability, purposive sampling technique without randomisation to compile a sample with specific population parameters (Cohen et al., 2007). I elected to use a purposive sampling technique to intentionally obtain specialised information from learners regarding their experiences of the research phenomena (self-regulatory processes and academic achievement) (Muijs, 2011). A purposeful sampling technique, however, considered to be biased and therefore prohibited me from generalising findings to an entire population (e.g. all Gr. 11 and Gr. 12 learners in South Africa) (Cohen et al., 2007).

My chosen sample displayed the following population parameters:

- Participants included Gr. 11 and 12 learners attending a high school.
- The participating schools were located in the Madibeng school district in North-West province, South Africa.
- The schools displayed diverse characteristics (e.g. public schools and a private school).
- The participants displayed varied demographical characteristics (e.g. race and language).

Sample size was an important initial consideration because it influences the choice and complexity of statistical analysis (Cohen et al., 2007). I planned to do a principal components analysis (PCA) (see section 3.8.3.2), based on the meaningful commitment and autonomous self-regulatory scale. Authors recommend a sample size of at least 100 participants (Hatcher & O'Rourke, 2013) or 10 participants per item (Pallant, 2001) for PCA. The sample of the present study was large enough to allow for PCA,

because it contained 351 participants (see section 4.2), and there were 20 items in the meaningful commitment and autonomous self-regulation questionnaire, requiring 200 participants.

I also planned to conduct a path analysis (see section 3.8.3.3). Path analysis requires a smaller sample size than structural equation modelling due to the exclusion of latent variables (Cohen et al., 2007). Hatcher and O'Rourke (2013) state that there is no definite consensus concerning sample size requirements for path analysis, and suggest a minimum of 100 participants. I chose to follow the recommendations for minimum sample size set out by Kline (2010), and ensured that I included between 10 and 20 participants in the sample for each parameter in each model (e.g. variances, regression coefficients and covariance between variables). The present study included approximately 23 parameters (11 in the hypothesised model 1 and 12 in model 2), which indicated a minimum sample size of 230 participants. I strove to include more than the minimum number of participants because I was mindful of additional possible influences on eventual sample size, including: variance of the population, the determination of confidence intervals, possible attrition and availability of participants and administrative procedures (Struwig & Stead, 2001; Suresh & Chandrahekara, 2012).

I invited six schools to take part in the present investigation in an attempt to include a large sample and include diverse types of school with varied demographical variables. Three schools declined to participate in the research for logistical reasons (e.g. they were already involved in other research projects or they needed to prioritise preparations for upcoming learner assessments). Two of the three schools that agreed to participate in the present study are Afrikaans-medium public schools with additional governing body funding. The third school is an independent English-medium school receiving funding from a non-profit trust. Two of the three schools appeared to be well-resourced while the remaining other school appeared to be under-resourced.

3.7.3 DATA COLLECTION PROCEDURES

I obtained prior ethical clearance from the Faculty of Education Ethics Committee (appendix 1) of the University of Pretoria and permission from the North-West Department of Education (appendix 2) before I approached and formally invited the schools to take part in the present study.

Data collection occurred over two time periods, as indicated in figure 3.3 on the following page. The first data collection phase (T1) involved the completion of questionnaires by participants, during allocated timeslots that would not interfere with their academic activities, (see appendix 3 and 4), containing:

(i) the biographical survey;
(ii) the learning climate questionnaire;
(iii) the meaningfulness subscale of the academic commitment scale;
(iv) the autonomous self-regulation scale; (v) the perceived competence scale and
(v) the perceived needs satisfaction scale.

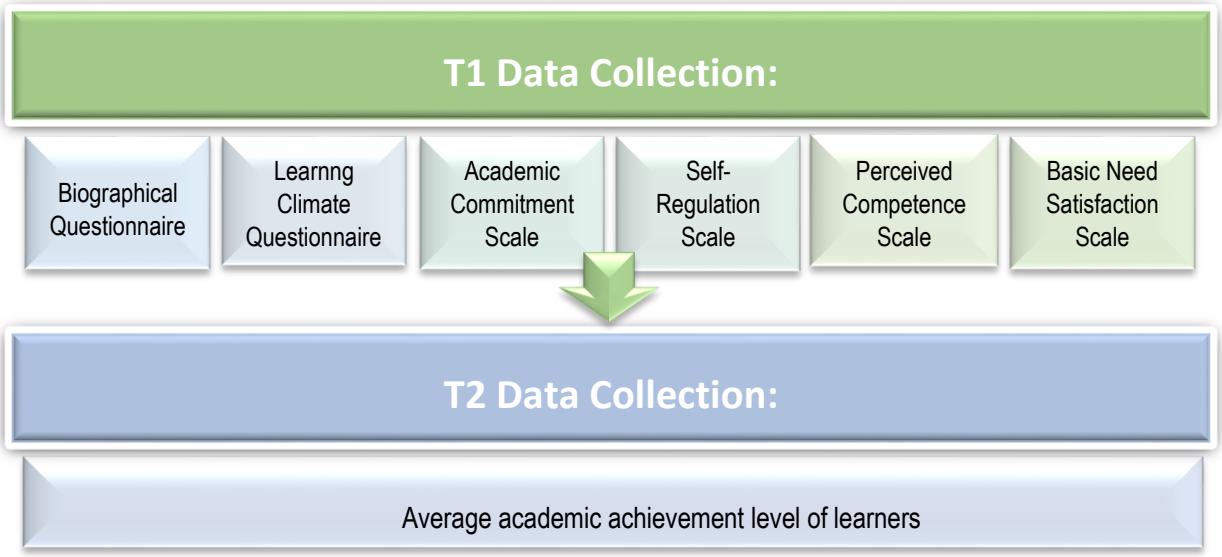

Figure 3.3: Data collection phases of the present study

During a second phase of data collection (T2), the participating schools provided me with the participating learners' first term academic results. These marks included the results of assignments and tests completed by participants as part of the South African curriculum. I received the combined average overall academic achievement level in all subjects for each participating learner.

The parents of all of Gr. 11 and Gr. 12 learners in each school received informed consent letters appendix 6), and the participating learners received informed assent letters (appendix 7) prior to data collection. Participation in the present investigation was voluntary. Table 3.1 on the next page, presents a summary of response rates of the three participating schools. An overall response rate of 46% was obtained in the present study. Similar lower response rates have been noted in other South African investigations with Gr. 11 and 12 learners as participants (e.g. Strydom, Pretorius & Joubert, 2012). The failure of learners to return informed consent letters from parents, as well as a service delivery protest in the community during the first phase of data collection that prohibited participants from attending school, influenced the response rate of participants. No attrition occurred during the second phase of data collection and I was therefore able to obtain the academic results of all participants who completed questionnaires during the first phase of data collection.

Table 3.1: Response rates in the present study

School	Questionnaires	Completed questionnaires	Response rate phase 1	Response rate phase 2
School 1	380	193	50.7 %	100%
School 2	300	123	41 %	100%
School 3	160	76	48 %	100%
Total	840	392	46%	100%

3.7.4 RESEARCH INSTRUMENTS

3.7.4.1 Biographical questionnaire

I used a biographical questionnaire to collect demographical data and potential contextual influences on academic achievement. All the items included in the biographical questionnaire are closed-ended, except for identifying information (e.g. "What average percentage academic mark do you hope to achieve at the end of the first term?"). Dichotomous questions were also included (e.g. yes/no) to ensure the opportunity for quick responses and to capture nominal data (Creswell, 2013). I also included questions based on a rating scale (e.g. never, rarely, every once in a while, sometimes and almost always) in order to measure different levels of response. A possible limitation of rating scale questions is a centralising tendency, where participants tend to choose midpoint options (Cohen et al., 2007). The questionnaire measured the following variables:

- Demographical variables (identifying detail, age, gender, grade, race and home language instruction) *(V1 – V3, V5 – V7 and V9).*
- Learners' perceived investment in academic activities (expected academic mark and hours invested in academic activities) *(V4 and V8).*
- Future goal setting (future career in mind and setting learning goals) *(V10 and V11).*
- Factors potentially influencing academic achievement negatively (extramural activities, procrastination, lack of resources, lack of study skills, responsibilities at home and disinterest in school) *(V12 – V18).*
- Support from other individuals to improve academic achievement (family members, teachers, friends, and other caregivers) *(V19 – V23).*

The biographical questionnaire and all other data collection instruments were translated into Afrikaans to accommodate the language preferences of some of the participants (see appendix 4). Back translation (Sperber, 2004) was utilised as the translation method, where I first sourced the original questionnaire items, second, translated the questions into Afrikaans and then asked another individual who is fluent in both English and Afrikaans to retranslate the Afrikaans items into English. I then presented the original and retranslated questionnaires to my supervisors for them to comment on the face validity of the measurements, and adapted the wording or phrasing following their recommendations.

It is important to note, that I conducted a brief informal piloting phase to receive feedback on the wording or degree of clarity of items, the length of the questionnaire and possible sensitive questions (Cohen et al., 2007). I presented the questionnaire to a small group of Gr. 11 and 12 learners (who were not taking part in the present investigation), teachers, statisticians aiding me with the analysis of the data and my supervisor and co-supervisor. I adapted the questionnaire based on their feedback, by removing leading items in the biographical questionnaire, shortening the length of the questionnaire, changing coding options and changing the layout.

3.7.4.2 Learning climate questionnaire

Perceived basic need support was operationalised by the learning climate questionnaire (Williams & Deci, 1996). The learning climate questionnaire forms part of other domain-specific climate questionnaires (e.g. health care, sport, and work climate questionnaires) based on SDT; which are designed to measure the extent to which individuals feel that their environments are autonomy-supportive. The learning climate questionnaire has been used extensively in previous investigations and high internal consistency levels have been reported: for example, Chen and Jang (2010) report an alpha of .95. The learning climate questionnaire has also been used in prior investigations involving an array of cultures, with researchers reporting similar high internal consistency levels (Zhou, Ma & Deci, 2009).

The learning climate questionnaire contains 15 items that represent a series of statements measuring an individual's perceived level of need support by teachers. Items measure autonomy support (e.g. "I believe that my teachers provide me with choices and options"), competence support (e.g. "My teachers convey confidence in my abilities") and relatedness support (e.g. "I do not feel very good about the way my teachers communicate with me"). I used the questionnaire as a unidimensional measurement of need support. Items were presented on a 7-point Likert scale with anchoring responses on extremes (1= strongly disagree and 7= strongly agree) with one reversed scoring item (V36). Mean scores for need support were calculated with higher scores representing higher levels of perceived need support by teachers.

3.7.4.3 The meaningfulness subscale of the academic commitment scale

The full academic commitment scale (Human-Vogel & Rabe, 2015) contains subscales measuring level of satisfaction, quality of alternatives, investment size, meaningfulness and commitment level, which in combination represent level of commitment to academic activities. The meaningfulness subscale of the academic commitment scale was specifically used in the present study to operationalise meaningful or identity-relevant academic commitment. Human-Vogel and Rabe (2015) report that all other academic commitment subscales predicted meaningful commitment, offering additional support for my decision to use the meaningfulness subscale in isolation in the present study.

The nine-item meaningfulness subscale is based on a 7-point Likert-type scale with anchoring responses. An example of a question in the meaningfulness subscale is: "Studying is an important aspect of my life" (Human-Vogel & Rabe, 2015). I adapted the questionnaire for the present study by replacing the word "studying" with "academic activities", in order to operationalise all school-based academic activities. The academic commitment scale has only been used in South African tertiary-level student populations (e.g. Human-Vogel & Dippenaar, 2013). Human-Vogel and Rabe (2015) report an alpha of 0.89 for the entire academic commitment scale and 0.91 for the meaningfulness subscale.

3.7.4.4 Autonomous self-regulation questionnaire

Autonomous self-regulation was operationalised by an adapted version of the treatment self-regulation questionnaire. The questionnaire was adapted to include academic activity descriptions. The treatment self-regulation questionnaire (Williams, Cox, Kouides & Deci, 1999) is a variant of the self-regulation scale (Ryan & Connell, 1989). Other adapted questionnaires originating from the self-regulation scale measure autonomous self-regulation concerning aspects such as pro-social behaviour, friendships, or religion (Deci & Ryan, 2000). The adapted self-regulation questionnaire, used in the present study, had 12 items and measured levels of autonomous self-regulation of participating learners during academic activities. The responses to items are rated on a 7-point Likert scale and include items measuring: (i) *external regulation* (e.g. "others would get mad at me if I did not participate in academic activities"); (ii) *introjected regulation* (e.g. "I think that participating in academic activities is part of what learners are supposed to do"); (iii) *identified regulation* (e.g. "I value the experience I have when I participate in academic activities") and (iv) *intrinsic regulation* (e.g. "it is fun to participate in academic activities"). Williams et al. (1998) reported an alpha coefficient of 0.84 for the treatment self-regulation questionnaire in a US sample and Van Ree (2011) reported an alpha coefficient of 0.79 in a South African sample.

Vansteenkiste et al. (2010), discuss three methodological approaches that can possibly be used to interpret internalisation scores (i.e., results from the autonomous self-regulation questionnaire), including: (i) investigating correlates of intrinsic motivation and different forms of extrinsic motivation, (ii) considering the independent effects of either autonomous and controlled motivation and, (ii) using the relative autonomy index (RAI). I initially decided to calculate a RAI to obtain a singular composite score

of autonomous self-regulation. Higher positive RAI scores are indicative of higher levels of autonomous self-regulation (Vallerand & Ratelle, 2002). I used the following formula as advised by Ryan and Connell (1989) to calculate the RAI levels of participants:

$$Relative\ Autonomy\ Index\ (RAI) = (External\ regulation \times -2) + (Introjected\ regulation \times -1) + Identified\ regulation + (Intrinsic\ regulation \times 2)$$

Stated differently, it is expected, based on SDT theoretical assumptions, that there will be a positive correlation between subscales closer to each other on the continuum of autonomous self-regulation (e.g. intrinsic regulation and identified regulation) than subscales that are theoretically further apart on the continuum of autonomous self-regulation (e.g. extrinsic regulation and intrinsic regulation). Accordingly, I calculated the correlations between subscales of the autonomous self-regulation scale to inspect whether a quasi-simplex model existed in the present sample.

My initial decision to use a RAI score, was based on several considerations. Ryan and Connell (1989), developed the self-regulation scale, and reported a quasi-simplex pattern corresponding with an autonomous self-regulation continuum, offering empirical support for the use of a RAI score. Levesque, Williams, Elliot, Pickering and Finley (2007), similarly, conducted a validation study of the treatment self-regulation questionnaire (an adapted version was used in the present study), and also reported that a quasi-simplex structure exist between different self-regulatory subscales. In addition, a RAI score allows researchers to obtain one composite score of participants' autonomous *relative* to controlled motivation (Ratelle et al., 2007). It is important to consider a relative interpretation of internalisation, because learners may experience both autonomous and controlled motivation simultaneously in academic environments (e.g. I am doing my homework because I value the personal importance thereof, but also to avoid feeling guilty). Furthermore, several researchers have successfully used RAI scores in the education domain, and reported satisfactory quasi-simplex structures (e.g. Chirkov, Vansteenkiste, Tao & Lynch, 2007; Katz et al., 2014).

The RAI results from the present, study did display a quasi-simplex pattern (see section 4.2.2.3), because the self-regulatory subscales closer to each other on the autonomous self-regulatory continuum shared stronger correlations, than subscales further away from each other. It was, nevertheless, concerning that subscales further removed from each other on the autonomous self-regulation continuum, shared positive instead of negative correlations. Also, recently there seems to be some debate in SDT literature about whether one should use RAI scores or not. Chemolli and Gagné (2014), for instance questioned the use of an RAI score on statistical and theoretical grounds, and recommend that researchers interpret each self-regulatory subscale separately, whereas Sheldon, Osin, et al. (2015), recommend the use of unweighted RAI scores.

An important outcome of the present study, was to assess the association between autonomous self-regulation and meaningful commitment, and I therefore required one composite score of autonomous

self-regulation. Thus, it would have been counterproductive to consider each self-regulatory subscale separately. Moreover, very few researchers in the educational domain, to the best of my knowledge, have used an unweighted RAI scores to interpret internalisation results.

Based on the aforementioned literature and PCA results from the present study (cf. chapter 4 section 4.3.3), we decided to also consider the independent effects of autonomous motivation (i.e., intrinsic and identified regulation) on all other variables in subsequent inferential analysis. Several investigations in the education domain have also used this methodological approach successfully (e.g. Vansteenkiste, Zhou, Lens, & Soenens, 2005; Zhou, et al., 2009)

3.7.4.5 Needs satisfaction scale

Basic psychological need satisfaction was operationalised through an adapted version of the need satisfaction scale in relationships (La Guardia et al., 2000). I adapted the need satisfaction scale, by adding the instruction "while participating in academic activities…" to the beginning of the scale, making it applicable to academic contexts (see appendix 3). The adapted need satisfaction scale, therefore, measured the extent to which a learner feels that their perceived basic psychological needs (autonomy, competence, and relatedness) have been satisfied by other individuals within their learning environment. Several items related to need *frustration* were reverse scored, so that I could get a composite score of need *satisfaction*. Specifically, V 74 represented competence frustration, V 76 relatedness frustration and V 80 autonomy frustration. An overall composite score or need satisfaction was calculated in the present study and I therefore used the need satisfaction scale as a unidimensional instrument.

The basic need satisfaction scale consists of nine items with anchoring responses on a 7-point Likert scale. The need satisfaction in relationships scale has been used in local (Thekiso et al., 2013) and international samples (e.g. Sapmaz, Doğan, Sapmaz, Temizel & Tel, 2012) with varying reported levels of internal consistency. La Guardia et al. (2000) report internal consistency of between 0.90 and 0.92 in interpersonal settings.

3.7.4.6 Perceived competence scale

I also measured perceived competence satisfaction, in addition to competence need satisfaction as part of the need satisfaction scale. Differently put, I obtained an overall composite score of need satisfaction via the need satisfaction scale (including all three basic psychological needs) and a specific measurement of perceived competence through the perceived competence scale. I included the perceived competence scale in addition to the need satisfaction scale, because several researchers in the past have indicated that perceived competence leads to positive academic outcomes (e.g. Feldman & Kubota, 2014; Komarraju & Nadler, 2013; Stankov, Lee, Luo & Hogan, 2012).

I consequently used the perceived competence scale (Williams & Deci, 1996) to operationalise the learner's perceived level of competence in academic tasks. The perceived competence scale consists

of four items (e.g. “I feel confident in my abilities to participate in academic activities at school”) which are measured according to a 7-point Likert scale with anchoring responses. Williams et al. (1998) reported an alpha coefficient of 0.80. Investigators also report that the perceived competence scale displays high levels of face validity (Lonsdale et al., 2012). The perceived competence scale has been used before in investigations within the educational domain (e.g. Williams & Deci, 1996).

3.8 DATA ANALYSIS

3.8.1 DATA CAPTURING AND STATISTICAL ANALYSIS SOFTWARE

Data analysis was conducted in consultation with the Department of Statistics of the University of Pretoria. I first coded the data captured from questionnaires into predetermined values. A “double entry” measure was created where another person entered my coded data into an Excel spreadsheet, after which I checked the entered responses against responses on the questionnaire, thus increasing the auditability of the data (Prymachuck & Richards, 2007). The controlled data set was then entered into SPSS, version 23, which was used as data analysis instrument for descriptive analysis, and into SAS 9.3 in order to conduct path analysis.

The data was screened for missing variables and outliers. It was noted that there were 31 cases with missing variables (10.5%). Listwise deletion or complete-case analysis (Pigott, 2001) was implemented, where incomplete cases were disregarded in all analyses, in effect reducing sample size to a maximum of 351 participants. Complete-case analysis produces limitations on data analysis such as reducing statistical power due to a smaller sample size (Schlomer, Bauman & Card, 2010). The decision to use complete-case analysis in the present study was, however, based on the small number of deleted cases, which in turn posed a limited threat to statistical power and bias (Langkamp, Lehman & Lemeshaw, 2010).

3.8.2 DESCRIPTIVE ANALYSIS

Descriptive analysis was conducted as an initial data analysis step to describe the sample characteristics by summarising and organising data in a meaningful way (Sullivan, 2008). In keeping with the recommendations of Cohen et al. (2007), the centrality (means, mode and medians) and variability (standard deviation and variation) of all variables were measured. Univariate analyses of nominal variables (e.g. age and gender) contained in the biographical questionnaire were furthermore visually represented by frequency tables. The distribution of the measurement sales was inspected in terms of their skewness and kurtosis statistics to determine whether the data displayed a normal distribution, informing decisions regarding the use of parametric or non-parametric analysis methods (Cohen et al., 2007).

The Cronbach alpha of each scale was calculated to determine its internal consistency levels. Internal consistency is the extent to which items in a scale consistently measure the intended construct, which in

turn shows whether the instrument is reliable and valid for the present sample (Tavakol & Dennick, 2011). Internally consistent scales usually produce a Cronbach alpha of 0.7 and above, and the results from scales with lower Cronbach alphas should be interpreted with care (Cohen et al., 2007). I also examined the correlation matrix for each individual item and the item total correlations of the scale as an additional measurement of internal consistency (Maree, 2007).

3.8.3 INFERENTIAL ANALYSIS

3.8.3.1 Correlation analysis

The Pearson-product correlation of all measured variables was calculated to examine existing associations between constructs. This parametric version of correlational analysis delivers correlation coefficients that are interpreted according to their magnitude, direction and significance, but does not deliver any insight into prediction or causality between constructs (Pietersen & Maree, 2007). A correlational analysis is an important initial analysis approach to path analysis (see section 3.8.3.2). It was, for instance, important to first determine whether zero-order correlations existed between constructs, for zero-order correlations are a prerequisite for regression analysis, which forms part of path analysis (Cohen et al., 2007). I also needed to establish whether the independent variables displayed collinearity (exceptionally high correlation coefficients), which also has a bearing on path analysis, for it is advisable that one measure unique variables (Pallant, 2001).

3.8.3.2 Principle component analysis

Researchers use principal component analysis (PCA) when they want to reduce a large number of observed variables into a smaller number of artificial variables (i.e., principal components) that account for the most variance in an observed variable (Hatcher & O'Rourke, 2013). Differently said, PCA is process where the underlying structure between measured variables are investigated, and how they relate to principal components (Carlberg, 2013; Dunteman, 1989). PCA may also be used to investigate multicollinearity concerns, because PCA transforms correlated observed variables into linearly uncorrelated components (Lafi &. Kaneene, 1992) also referred to mutually orthogonal components (Carlberg, 2013). A PCA was therefore implemented in the present study, including the meaningful commitment scale and autonomous self-regulation questionnaire to: (i) explore how observed or measured variables related to underlying components, (ii) to determine whether identified components related to theoretical constructs in a unique manner and (iii) to investigate the instrument validity of the autonomous self-regulation questionnaire in a South African sample.

Some researchers seem to refer to exploratory factor analysis (EFA) and PCA in an interchangeable manner, because it is assumed that both approaches use the same statistical procedures (Carlberg, 2013). Many authors, nevertheless, highlight some conceptual differences between EFA and PCA. Hatcher and O'Rourke (2013) for instance, mention that EFA assumes an underlying structure between

latent and observed variables whereas PCA do not, and that PCA only allows for the extraction of components that explain the most variance. PCA, moreover, unlike EFA does not account for measurement error (Carlberg, 2013). Some authors therefore advocate the use of EFA instead of PCA (e.g. Costello and Osborne, 2005). However, we chose to use PCA instead of EFA because, PCA addresses factor indeterminacy, which is a problematic feature of EFA (i.e., difficulty deciding which set of factor scores and loadings are most accurate) (Stevens, 2002). Several authors in addition also argue that EFA and PCA deliver similar results (Harrington, 2009; Yong & Pearce, 2007), thus supporting the choice of PCA in the present study

A first step in PCA is referred to as component or factor extraction (Carlberg, 2013). The amount of components derived from PCA are the same or less than the original number of observed variables (Carlberg, 2013). We therefore examined eigenvalues to determine which components were statistically meaningful (Hatcher & O'Rourke, 2013). As informed by Kaiser's criterion, we looked at how many eigenvalues were larger than one to determine how many factors were present (Pietersen & Maree, 2007). Some authors recommend additional methods for component extraction (e.g. Stevens, 2002) and we therefore also considered whether the identified components accounted for at least 60% cumulative variance as advised by Hair, Black, Babin, Anderson and Tatham (2006).

Rotation was implemented after component extraction, to improve interpretability of results. More precisely, a measured variable may be associated with more than one component, and rotation exploits high item loadings and reduces low item loadings to provide interpretable results (Williams, Onsman & Brown, 2010). We specifically implemented promax as oblique rotational method, where components are correlated and not rotated 90° from each other (Yong & Pearce, 2007). Thus, we did not utilise orthogonal rotation methods (e.g. Varimax and Quantimax), where it is assumed that components are uncorrelated, because as Costello and Osborne (2005) puts it, it is highly unlikely that factors or components are indeed uncorrelated in real life. Promax as rotation method, furthermore, also increases component loadings to the power of four, providing a simple structure (Yong & Pearce, 2007).

The pattern matrix produced by promax rotation was interpreted by: (i) observing whether each identified component contained at least three observed variables with significant loadings, (ii) whether the variables that load on each component, share a similar conceptual or theoretical meanings, (iii) if there are any cross loadings present (e.g. when an item displays two or more component loadings higher than .32, or the difference between highest and second highest loading are less than .15) and (v) whether the rotated pattern represents a simple structure, and variables displayed higher loadings (.32 or higher) on one component and lower loadings on another component (Hatcher & O'Rourke, 2013, Worthington & Whittaker, 2006; Yong & Pearce, 2007). These interpretations, helped me to decide whether items should be removed or kept, to improve the structure of the measurements, as well to test for collinearity (Hatcher & O'Rourke, 2013).

I proactively dealt with some of the limitations of PCA. Firstly, I collected data during a brief period (three months) (Young & Pearce, 2007). Secondly, I based my decisions on which component relates to which theoretical construct on existing literature and theory (Pietersen & Maree, 2007). Lastly, I made sure that the sample of the present study was large enough to allow for PCA.

3.8.3.3 Path analysis

A path analysis was conducted to answer my research questions and test my hypotheses (see section 3.5). Path analysis, an extension of a regression model and a variant of structural equation modelling (Garson, 2014), "allow[s] researchers to specify and test structural models that reflect a priori assumptions about spurious associations of direct or indirect effects among observed variables" (p. 145) (Kline, 2010, p. 121). Path analysis includes only observed variables and no latent variables, implying the assumption that each variable has only one indicator and that independent variables are measured without error (Raykov & Marcoulides, 2006).

Path analysis was used instead of multiple regression as analysis technique because I wanted to assess the combined and individual indirect effect of mediating variables by simultaneously calculating all paths (Schumacker & Lomax, 2012; Zhao et al., 2010). Path analysis as an analysis technique prohibited me from making inferences about causality and I was only able to observe whether associated variables predicted each other (Norman & Streiner, 2003). The decision to use path analysis instead of structural equation modelling was based on sample size constraints. However, this decision prohibited me from measuring latent variables and the measurement error of the scales (Kline, 2010). An additional potential pre-emptive concern of path analysis, which I dealt with proactively, is the failure of adequate model specification as informed by theoretical assumptions about the research phenomena (Garson, 2014). I therefore ensured that I consulted an adequate amount of literature on the variables and their possible associations before specifying hypothesised models.

In the present study, I consulted the recommended steps for structural equation modelling and path analysis as recommended by various authors (Holmbeck, 1997; Kline, 2010; Norman & Streiner, 2003) to understand path analysis. In following these recommendations, I formulated hypothesised models, as informed by existing theory and literature, to specify variables as well as the anticipated associations between these variables in a first step (see section 3.6). It is recommended that researchers in a second step establish whether the hypothesised model is identified by examining whether the number of observations in a model is lower than the number of parameters; in other words, whether the specified hypothesised models are capable of producing statistical results (Norman & Streiner, 2003).

Norman and Streiner (2003) recommend that parameters be calculated by totalling the number of paths, variances of exogenous variables, covariances and lastly disturbance terms, and that the number of observations be determined by the following formula:

$$Number\ of\ observations\ =\ [amount\ of\ variables\ (amount\ of\ variables\ +\ 1)]/2.$$

The third recommended step in path analysis concerns model and parameter estimation through maximum likelihood estimation (Holmbeck, 1997). The fourth step advised by authors relates to model testing by analysing (i) entire model fit and (ii) associations between individual parameters, including the examination of direct and indirect effects. Global fit of the entire model is initially determined by estimating a goodness-of-fit chi-square (x^2), in which the difference between observed data and expected data is investigated, with smaller values being indicative of a good model fit (Norman & Streiner, 2003). However, the x^2 test and Root Square Error of Approximation (RMSEA) as absolute model-fit indices are sensitive to sample size, and other relative model fit indices were included (Kline, 2010). As recommended, the individual path coefficients (beta weights) of all paths were inspected in order to determine the existence and direction of regression. The statistical significance of the path coefficients was further established by conducting a z-test (dividing the parameter by its standard error) (Norman & Streiner, 2003).

In the fourth step, depending on the outcome of the model-fit analysis, it is recommended to conduct model modification to enhance the fit between the structural model and observed data. Model modification is implemented by removing or adding parameters. Decisions regarding model modification in the present study were based on existing literature informing the perceived probability of the model modification (Hancock & Mueller, 2013).

It was also necessary to compare various models, to decide which model displayed improved fit of data. The modified models in the present study were not nested or hierarchical, because each model included different variables (Kline, 2010), and the use of chi-square values, therefore, would have been ineffective (Schumacker & Lomax, 2012). Researchers recommend the use of other absolute fit indices to compare non-nested models, if models are based on the exact same data. These fit indices include the Akaike Information Criterion (AIC) and Consistent Version of AIC (CAIC), the Browne-Cudeck criterion (BCC) and Expected Cross-validation Index (ECVI) as well as the Bayesian Information Criterion (BIC). Authors generally, propose that the model with the lowest fit indices represent the best fit with data (Kline, 2010; Hooper, Coughlan & Mullen, 2008; Schumacker & Lomax, 2012). Jackson, Dezee, Douglas and Simeall (2005) moreover, suggest that one look at the aforementioned fit indices of the default (i.e., model specified), saturated (i.e., model in which there are as many parameters as observables) and independent model (i.e., model assuming no correlations between variables). More specifically, Jackson et al. (2005) propose that the model in which AIC, CAIC, BCC, BIC or ECVI values are closer to the saturated model and further removed from the independence model shows improved fit of data. Said differently, one compares the extent to which different models relate to worst case scenario – when a model does not display any correlations (Jackson et al., 2005).

In a fifth and final step, it is recommended that the researcher review direct effects (i.e., the regression of one independent variable on the dependent variable), indirect effects (i.e., where one variable predicts

another through a third variable) and total effects (i.e., the combined direct and indirect effect) in order to draw conclusions regarding the categorisation of indirect effects (Raykov & Marcoulides, 2006).

We also examined whether indirect effects were mediators. Mediation is present in path models, when the independent and dependent variable share a zero-order correlation (Kline, 2010). We used Zhao et al.'s (2010) recommendations for classification of mediated effects. More specifically, historically, authors have argued that indirect (mediational) effects are only present when a direct effect becomes insignificant, or its significance is reduced with the addition of the indirect effect (Baron & Kenny, 1986). Stated differently, it was advocated that the addition of a mediator would need to either eliminate or decrease the significance of the association between the independent and dependent variable, for it to be considered a significant mediator. Zhao et al. (2010) nonetheless challenge the classification for mediation as outlined by Baron and Kenny (1986) and suggest a classification system in which provision is made for differing forms direct effects. I therefore based my inferences about the indirect effects on the following categorisation, as recommended by Zhao et al. (2010):

- *Complementary mediation:* when both the mediator and direct effect are significant; overlaps with Baron and Kenny's (1986) partial mediation.
- *Indirect-only mediation*: where an indirect effect exists but no direct effect, which overlaps with full mediation as outlined by Baron and Kenny (1986).
- *Competitive mediation*: when both the mediator and direct effect exist, but point in different directions.
- A *direct-only non-mediation:* in which a direct effect occurs and no indirect effect is present.
- *No effect non-mediation:* where no direct effect or mediation exists.

Preacher and Hayes (2008) mention different ways in which the significance levels of indirect effects can be investigated and quantified. These include the causal steps approach, the product-of-coefficients approach (also known as the Sobel test), distribution of product strategy and bootstrapping. A bootstrap approach was used in the present study because it produces a higher level of statistical power while maintaining reasonable control over Type I errors (the incorrect rejection of a true null hypothesis) (MacKinnon, Warsi & Dwyer, 2010; Preacher & Hayes, 2008). Bootstrapping as a technique is a process where unique same-size samples are constructed from an existing sample and the original sample is then considered as the population, to increase statistical power and make inferences about accuracy and in this case indirect effects (Cohen et al., 2007). The sample distribution of the individual and total indirect effects was therefore bootstrapped by creating different unique samples (resamples) of the same size. This process is completed k times, where k should be at least 1 000 (Preacher & Hayes, 2008).

The confidence intervals for the individual indirect effects were created by sorting the k values from low to high. Values defining the lower and upper percentiles of the distribution were then found and taken as the lower and upper limits of the confidence interval (Preacher & Hayes, 2008). The confidence

intervals in bootstrapping may be asymmetrical because it is based on an empirical estimation of the sample distribution (not assuming that it is normal) (Preacher & Hayes, 2008). Preacher and Hays (2008) recommend that this may be corrected by adjusting the percentile values of the sorted distribution of bootstrap estimates used for the determining of the intervals. This is called “bias corrected intervals” (Efron & Tibshirani, 1994).

3.9 CONCLUSION

In this chapter, I attempted to provide a clear and accurate description of my research design and the methodological considerations of the present study by indicating the benefits and limitations of my methodological choices. I discuss the results of the present study in the following chapter.

Chapter 4
Results

4.1 INTRODUCTION

In this chapter I report on the results of methodological procedures that were followed, as described in Chapter 3. I provide an overview of the sample characteristics as reported by descriptive analysis, a principal component analysis as well as the results of several path analyses in an attempt to answer my research questions concerning. Data analysis in the present study was conducted in consultation with the Statistics Department of the University of Pretoria.

4.2 DESCRIPTIVE ANALYSIS

4.2.1 SAMPLE PROFILE

4.2.1.1 Demographical variables

Listwise deletion or complete case analysis of all scales was implemented (see chapter 3 section 3.8.1) and the resulting sample size of the present study was 351 participants. Non-probability sampling was utilised to source participants from three schools: school one (n = 163), school two (n = 118) and school three (n = 70). The sample consisted of 147 (41.6%) male and 205 (58.4%) female participants. The participants were in Gr. 11 (55.14%) and Gr. 12 (44.86%). The mean age of participants was 17.37 years (SD = .8). Most of the participants were white (76.92%) and received education in their home language (81.38%). Table 4.1 presents an overview of the demographical variables of the present sample.

Table 4.1: Demographic variables of sample

	f	%
Participants from participating schools (n = 351):		
School 1	163	46.44
School 2	118	33.62
School 3	70	19.94
Age in years (n = 347, $\overline{\times}$ = 17.37, SD = .8):		
15–16	39	11.24
17–18	286	82.42
19–20	22	6.34

Gender (*n* = 351):		
Male	147	41.60
Female	205	58.40
Gr. (*n* = 350):		
Gr. 11	193	55.14
Gr. 12	157	44.86
Race (*n* = 351)		
White	270	76.92
Black	75	21.37
Coloured	5	1.42
Other	1	.28
Receiving education in home language (*n* = 349)		
Yes	284	81.38
No	65	18.62

4.2.1.2 Behavioural investment, future goals, expected marks and hours spent on schoolwork

Table 4.2 presents an overview of participants' self-reported time spent on schoolwork, the extent to which they set learning goals and have future careers in mind. Most of the participants in the present study reported that they had a future career in mind and that they set learning goals for themselves. The mean average mark that learners expected to achieve at the end of the term was 67.7% and the participants reported that they spent an average of 23.23 hours on schoolwork per week.

Table 4.2: Future careers, learning goals, achievement expectations and time spent on schoolwork

	ƒ	%
Having a future career in mind (*n* = 351)		
Yes	312	88.89
No	39	11.11
Setting learning goals for self (*n* = 351)		
Yes	272	77.49
No	79	22.51

Expected mark at the end of the term (*n* = 347, $\overline{X}$ = 67.61, SD =10.95)

Hours spent on school work per week: (*n* = 334, $\overline{X}$ = 23.23, SD = 17.23)

4.2.1.3 Self-reported negative and positive influences on academic achievement

Table 4.3 is a summary of the participants' self-reported negative influences on academic achievement levels. I asked participants to rate how often predefined factors influenced their academic performance levels on a 5-point scale, including the following categories: 1 – never; 2 – rarely; 3 – every once in a while; 4 – sometimes; 5 – almost always. Table 4.3 shows that participants reported that a lack of resources and obligations at home had the least frequent self-reported negative influence on their academic achievement levels. However, participants reported that socialising with friends, time spent using technology and extramural activities influenced their academic achievement levels in a negative way on an every once in a while basis.

Table 4.3: Self-reported negative influences on academic achievement

Self-reported negative influence on academic achievement	*n*	Min	Max	$\overline{X}$	SD
Extramural activities (e.g. sport)	350	1	5	3.07	1.39
Time spent on watching television, laptop and/or cellphone	350	1	5	3.13	1.16
Socialising with friends	345	1	5	3.26	1.24
Lack of resources (e.g. books, transport or electricity)	349	1	5	1.69	.95
Inadequate study skills	346	1	5	2.62	1.21
Obligations at home	350	1	5	1.97	1.21
Not being interested in school work	350	1	5	2.32	1.24

4.2.1.4 Self-reported sources of support for academic achievement

Table 4.4 on the following page, is a summary of participants' self-reported sources of support for academic achievement. I once again asked participants to report how often they experienced support from specific individuals to achieve academic success on a 5-point scale (ranging from 1, representing never, to 5 representing almost always). Mean responses from participants indicated that they most frequently received academic support from parents and least often from other caregivers. Participants also reported that they received academic support from teachers, friends and siblings on an every once in a while basis.

Table 4.4: Self-reported sources of support for academic achievement

Self-reported sources of support for academic achievement	*n*	Min	Max	$\overline{\times}$	SD
Parents	351	1	5	4.35	1.01
Teachers	351	1	5	3.78	1.03
Friends	346	1	5	3.67	1.07
Siblings or other family members	350	1	5	3.52	1.33
Other caregivers	349	1	5	1.93	1.44

4.2.2 DESCRIPTIVE ANALYSIS OF SCALES

4.2.2.1 The distribution and scale reliability of the learning climate questionnaire

A summary of descriptive statistics of the learning climate questionnaire that I used to operationalise need support is presented in table 4.5.

Table 4.5: Descriptive statistics for the Learning Climate Questionnaire

N		$\overline{\times}$	Md	SD	Lower Quartile	Upper Quartile	Min	Max
Valid	Missing							
351	0	4.17	4.2	1.25	3.13	5.06	1.00	7.00

Mean responses from participants as shown in table 4.5 could be interpreted as resembling average levels of perceived need support from teachers. Responses on the questionnaire also appear to resemble a symmetrical distribution for both skewness (.01) and kurtosis (-.80) statistics existed between 2 and -2 (George & Mallery, 2010). The internal consistency of the learning climate questionnaire in the present study was high (α = .92) as measured by Cronbach's alpha (Cohen et al., 2007). Millon and Bloom (2008) furthermore, recommend that item-total correlations should be .3 or higher for a research instrument to be considered reliable. The item-total correlations for the learning climate questionnaire ranged between .52 and .92.

4.2.2.2 The distribution and scale reliability of the academic commitment scale (meaningfulness subscale)

A summary of descriptive statistics of the meaningfulness subscale that I used to operationalise meaningful commitment is presented in table 4.6 on the next page.

Table 4.6: Descriptive statistics for the academic commitment (meaningfulness) subscale

N		$\overline{\times}$	Md	SD	Lower Quartile	Upper Quartile	Min	Max
Valid	Missing							
351	0	4.44	4.48	1.44	3.38	5.63	1.00	7.00

Mean responses of participants as seen in table 4.6 indicates average levels of meaningful commitment. The distribution of the scale in the present sample appears to be symmetric (skewness = -.15, kurtosis = -.79) (George & Mallery, 2010). The internal consistency of the academic commitment (meaningfulness subscale) is considered high (α = .90) in the present study (Cohen et al., 2007). Inter-total correlations were also satisfactory, ranging between .45 and .81 (Millon & Bloom, 2008).

4.2.2.3 The distribution and scale reliability of the autonomous self-regulation scale

The distributional properties of the autonomous self-regulation scale as well as its subscales, which I used to operationalise autonomous self-regulation, are indicated in table 4.7 I initially, calculated the relative autonomy index (RAI), a composite score of all subscales, for reasons discussed in chapter 3 section 3.7.4.4, by using the following formula as recommended by Ryan and Connell (1989):

$$\begin{aligned} &Relative\ Autonomy\ Index\ (RAI) \\ &= (External\ regulation \times -2) + (Introjected\ regulation \times -1) \\ &+ Identified\ regulation + (Intrinsic\ regulation \times 2) \end{aligned}$$

Table 4.7: Distributional properties of the autonomous self-regulation questionnaire including subscales

	Relative Autonomy Index	Intrinsic Regulation subscale	Identified Regulation subscale	Introjected Regulation subscale	External Regulation subscale
No of items	12	3	3	3	3
Mean	4.64	4.64	5.09	4.53	4.14
Median	3.00	4.67	5.33	4.67	4.00
Standard Deviation	11.19	1.56	1.44	1.70	1.45
Lower Quartile	-2.00	3.67	4.00	3.00	3.00
Upper Quartile	11.00	5.67	6.34	6.00	5.00
Minimum	-31.00	1.00	1.00	1.00	1.00
Maximum	46.00	7.00	7.00	7.00	7.00

Reported mean scores of participants, as indicated in table 4.7, suggest that learners displayed average levels of intrinsic regulation, identified regulation and external regulation and high average levels of introjected regulation. Composite mean scores, informing the RAI, are furthermore suggestive of average levels of autonomous self-regulation. The distribution of the questionnaire appears to be symmetric and normally distributed for the skewness (.11) and kurtosis (1.15) of the distribution of the full scale is considered acceptable (George & Mallery, 2010).

I only considered the internal consistency levels of the subscales of the autonomous self-regulation scale, because the full-scale measures conceptually varying levels of self-regulation, making reliability inferences redundant. The internal consistency levels of the intrinsic regulation (α = .87) and identified regulation (α = .85) subscales were high and the internal consistency of the introjected regulation (α = .78) subscale was moderate but still acceptable (Pietersen & Maree, 2007). The internal consistency level of the external regulation subscale was however poor (α = .57) and interpretations regarding this subscale were made with circumspection (Pietersen & Maree, 2007).

(a) The simplex structure of the autonomous self-regulation scale

Table 4.8 shows the Pearson-product correlations between the subscales of the autonomous self-regulation subscale.

Table 4.8: Pearson correlation coefficients between subscales of the autonomous self-regulation questionnaire: a simplex pattern

	External regulation	Introjected regulation	Identified regulation	Intrinsic regulation
External regulation	1	.63**	.53**	.49**
Introjected regulation		1	.63**	.55**
Identified regulation			1	.78**
Intrinsic regulation				1

**Correlation is significant at the .01 level (2-tailed)

As discussed in chapter 3, section 3.7.4.4, I expected that a quasi-simplex structure would exist between the subscales of the self-regulation questionnaire, as has been demonstrated in other investigations using the questionnaire (e.g. Levesque et al., 2007). Findings from the present investigation (table 4.8) do correspond with a quasi-simplex pattern, for self-regulatory styles conceptually closer to one another on the continuum of autonomous self-regulation display higher levels of correlation than self-regulatory styles that are further apart on the continuum. The correlation between external regulation and introjected regulation (r (351) = .63, p <.01) for instance, was higher than the correlation between external regulation and intrinsic regulation (r (351) = .49, p <.01). Correspondingly, the correlation between

identified regulation and intrinsic regulation (r (351) = .78, p <.01) was stronger than the correlation between introjected regulation and intrinsic regulation (r (351) = .55, p <.01).

It was however concerning that a positive rather than a negative correlation existed between scales on the opposite end of the autonomous self-regulation continuum (e.g. external regulation and intrinsic regulation). It is important to note that similar positive correlational patterns have however been noted in other investigations using younger participants in their sample (e.g. Pelletier, Fortier, Vallerand, & Brière, 2001; Ryan & Connell, 1989).

4.2.2.4 The distribution and scale reliability of the perceived competence scale

The distributional properties of the perceived competence scale, which I used to operationalise perceived competence, are shown in table 4.9.

Table 4.9: Distributional properties of the perceived competence scale

N		$\overline{\times}$	Md	SD	Lower Quartile	Upper Quartile	Min	Max
Valid	Missing							
351	0	5.47	5.75	1.29	4.75	6.5	1.00	4.00

It can be inferred from table 4.9 that mean responses from participants indicated higher levels of perceived competence when engaged in academic activities. Skewness (-.81) and kurtosis (.13) statistics of the scale, furthermore, appear to be acceptable and indicative of a symmetrical and normal distribution (George & Mallery, 2010). The perceived competence scale displayed moderate and acceptable levels (α =.87) of internal consistency and reliability in the present study (Pietersen & Maree, 2007). The total-item correlations were acceptable and ranged between .68 and .85 (Millon & Bloom, 2008).

4.2.2.5 The distribution and scale reliability of the need satisfaction scale

The distributional properties of the need satisfaction scale, which I used to operationalise need satisfaction, are reported in table 4.10.

Table 4.10: Distributional properties of the need satisfaction scale

N		$\overline{\times}$	Md	SD	Lower Quartile	Upper Quartile	Min	Max
Valid	Missing							
351	0	4.75	4.78	.96	4.11	5.44	1.00	7.00

As can be noted in table 4.10, mean responses from participants related to average levels of perceived need satisfaction in their academic environments. Participant responses on the scale was normal and symmetrically distributed as indicated by its skewness (-.25) and kurtosis (-.07) statistics (George & Mallery, 2010). The internal consistency level of the need satisfaction scale (α = .72) was low, yet acceptable in the present study (Pietersen & Maree, 2007).

4.2.3 DESCRIPTIVE ANALYSIS OF THE ACADEMIC ACHIEVEMENT LEVELS OF PARTICIPANTS

The distribution of the academic achievement levels of participating learners is displayed in a histogram, presented in figure 4.1.

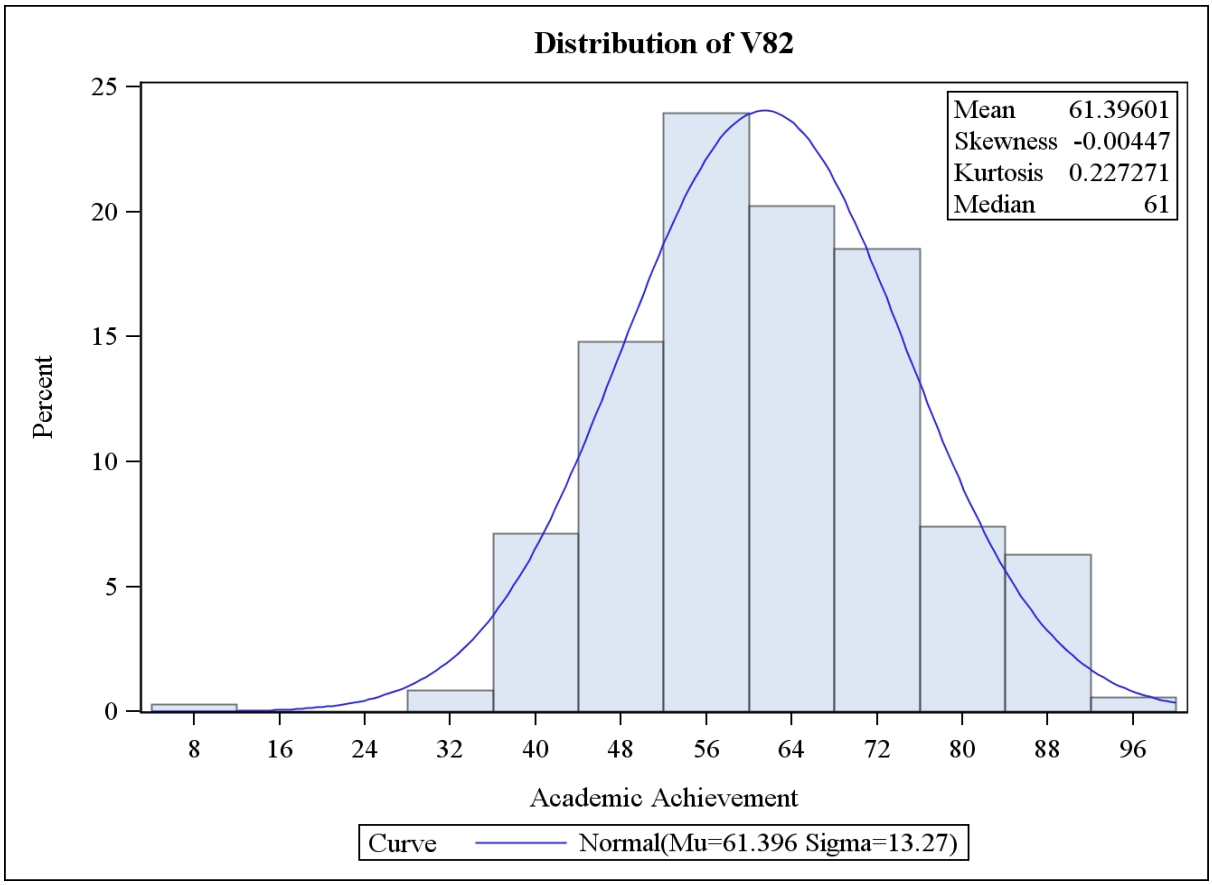

Figure 4.1: Histogram illustrating the distribution of academic achievement levels of participants

It can be inferred from figure 4.1 that most learners achieved between 40% and 72% and that the distribution of academic achievement levels resembled a normal distribution.

4.3 INFERENTIAL ANALYSIS

An inferential analysis was conducted to understand the associations between measured constructs, to determine if they share correlations and how they predicted academic achievement in a path model.

4.3.1 CORRELATIONAL ANALYSIS

Table 4.11 on the following page contains the reported Pearson-product correlations between all measured variables. A correlational analysis was conducted initially, because existing zero-order correlations between variables are a prerequisite for the existence of regression, forming part of path analysis (see section 4.3.1) (Cohen et al., 2007).

It can be seen in table 4.11 that all the independent variables in the present study were correlated with each other. The dependent variable, academic achievement, displayed a weak and positive correlation with the following independent variables: need support identified regulation, introjected regulation, perceived competence and need satisfaction. It is important to note that much of the independent variables in the present study shared moderate strength correlations, with none of them exceeding .9 which is according to Pallant (2001) non-suggestive of collinearity, or in other words represented unique constructs. The dimensionality of the autonomous self-regulation questionnaire and meaningful commitment scale were nevertheless also assessed as part of PCA (see section 4.3.3).

The findings concerning intercorrelations between variables were generally theoretically anticipated. The existence of the moderately positive associations between external regulation and the variables meaningful commitment, intrinsic regulation and identified regulation, as well as a weak positive correlation with the variables perceived competence, need satisfaction and need support, was however surprising. These unexpected moderate correlations could possibly be explained by the poor internal consistency of the external self-regulation subscale (see section 4.2.2.3).

It was also interesting to note that academic achievement and internalised and introjected regulation were correlated, while intrinsic regulation and academic achievement was not. Equally surprising was that academic achievement did not share a significant correlation with meaningful commitment or the RAI (autonomous self-regulation). It may be possible that the mean age of participants in the study may have had identity-developmental consequences, which in turn may have influenced the association between constructs

Table 4.11: Pearson-product correlations between measured constructs

	Need support	Meaningful commitment	Intrinsic regulation	Identified regulation	Introjected regulation	External regulation	Relative Autonomy Index (RAI)	Perceived competence	Need satisfaction	Academic achievement
Need support	**1**	**.48****	**.43****	**.43****	**.24****	**.24****	**.22****	**.37****	**.47****	**.17****
Meaningful commitment		1	**.73****	**.67****	**.50****	**.47****	**.26****	**.48****	**.46****	.10
Intrinsic regulation			1	**.78****	**.55****	**.49****	**.50****	**.52****	**.46****	.07
Identified regulation				1	**.63****	**.53****	**.33****	**.55****	**.40****	**.19****
Introjected regulation					1	**.63****	**-.23****	**.36****	**.16****	**.11***
External regulation						1	**-.45****	**.28****	**.20****	.03
Relative Autonomy Index (RAI)							1	**.26****	**.30****	.06
Perceived competence								1	**.45****	**.29****
Need satisfaction									1	**.16****
Academic achievement										1

Correlation significance levels: * p < .05, ** p < .01 (2-tailed)

4.3.2 INITIAL PATH ANALYSIS

An initial path analysis was conducted in an attempt to answer my research questions and also report on hypothesis-testing results (see chapter 3 section 3.5). Secondary path analysis, using the same data, was also conducted to assess more hypotheses (see section 4.3.4). I discussed proposed steps for the implementation of path analysis in chapter 3 (section 3.8.3.2). The first step, namely the construction of hypothesised models as informed by theory (chapter 3, section 3.6.1 and 3.6.2) has been elaborated in earlier chapters. In this section I discuss the last four steps, including: (i) model identification by the calculation of parameters and observations; (ii) model and parameter estimation by maximum likelihood estimation; (iii) the investigation of direct and mediating effects and (iv) model modification, if applicable. Covariance matrices were used in all calculations.

4.3.2.1 Model 1

(a) Hypothesised model 1

The hypothesised model 1 (figure 4.2) was entered into SAS 9.3. The purpose of this model was to establish whether a SDT motivational model was present in the present South African sample. The hypothesised model was over-identified (*df* = 3), which means that there were more equations available than were needed to calculate unique solutions for each parameter (Raykov & Marcoulides, 2006).

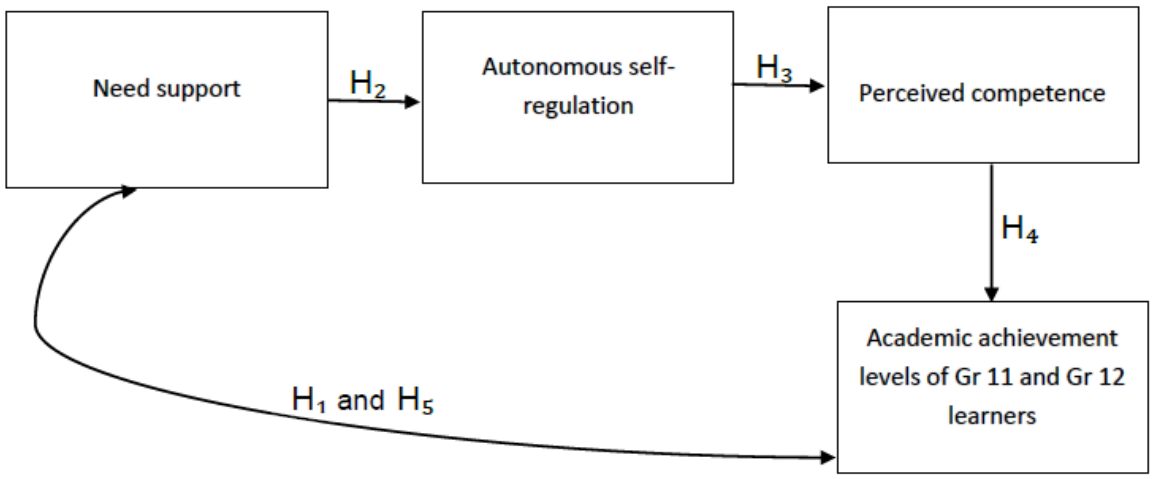

Figure 4.2: Hypothesised model 1

Table 4.12: Model fit indices: hypothesised model 1

	(x^2)	*p*	RMSEA	IFI	AGFI	CFI
Model	43.3	0.00	.196	.64	.81	.64
Acceptable ranges		>.05	<.06	>.90	>.90	>.90

I considered model-fit indices to establish whether I could make valid inferences regarding the model parameters (Kline, 2010). Absolute fit indices were used, including a chi-square test, the adjusted goodness-of-fit index (AGFI) and the root mean square measurement of approximation (RMSEA), to determine whether the measured covariance data was related to hypothesised covariance (or how well the measured data fitted the hypothesised model) (Hooper et al., 2008). Norman and Streiner (2003) report that lower and statistically insignificant chi-square results and higher AGFI results indicate model fit. Hu and Bentler (1995) indicate that RMSEA values should be less than .6 in models that fit data well. Absolute fit indices are, however, sensitive to sample and model size (Schumacher & Lomax, 2012), and relative fit indices including incremental fit index (IFI) and comparative fit index (CFI) were also considered, which compare diverse possible models in the same data (Iacobucci, 2010). IFI values higher than .90, RMSEA values lower than .05 and CFI values higher than .90 indicate adequate model fit (Fan, Thompson & Wang, 1999; Kline, 2010). It may be observed from table 4.12, on the previous page, that the hypothesised model did not fit the data well according to several model-fit indices. The original hypothesised model 1 was modified in order to improve model-fit indices to enable valid inferences regarding parameters.

(b) Modified model 1 (Model 1.1)

(i) Model-fit and parameter estimates of direct effects

Both the modified model 1.1 (figure 4.3) and the parameter estimates of model 1.1 are displayed in table 4.13 on the following page. Model 1 was modified by including two additional parameters or two additional hypotheses implying the following direct effects: hypothesis a, that needs support would predict perceived competence, and hypothesis b, that autonomous self-regulation (RAI) would predict academic achievement. Hancock and Mueller (2013) recommend that decisions regarding model modification to address external specification errors (e.g. omitted pathways) should be based on theoretical insight. Choices regarding which additional parameters to add were therefore informed by existing SDT literature suggesting that the proposed additional pathways would be plausible. Several authors have reported direct pathways from autonomous self-regulation (RAI) to academic achievement (Flink, Boggiano & Barett, 1990, Grolnick & Ryan, 1989; Miserando, 1996) and other authors indicated direct pathways between need support and perceived competence (Guay, Boggiano & Vallerand, 2001; Williams, McGregor, King, Nelson & Glasgow, 2005).

Model 1.1 was just identified or saturated (*df* = 0), which means that the number of parameters to be estimated was equal to the number of data elements and that a unique solution could be found for each parameter in captured data, resulting in a perfect fit (Hancock & Meuller, 2013). The resulting model-fit indices for the modified model, however, (as is the case for all saturated models) could not be determined (x^2)= 0.00, *df*, = 0, PLOSE, .00, IFI = 1, AGF = 0). Parameter estimation results including direct effects as proposed by hypotheses are indicated in table 4.13.

Table 4.13: Parameter estimates of model 1.1

Alternative hypothesis	Hypothesis accepted or rejected	Paths estimated	β	*z*	*p*	Total effect
Hypothesis 1	Rejected	Need support → academic achievement	.08	1.35	.17	.17
Hypothesis 2	Accepted	Need support → autonomous self-regulation (RAI)	.23	4.35	.00**	.23
Hypothesis 3	Accepted	Autonomous self-regulation (RAI) → perceived competence	.19	3.79	.00**	.19
Hypothesis 4	Accepted	Perceived competence → academic achievement	.27	4.80	.00**	.27
Additional path (Hypothesis a)	Accepted	Need support → perceived competence	.33	6.62	.00**	.37
Additional path (Hypothesis b)	Rejected	Autonomous self-regulation (RAI) → academic achievement	- .03	-.53	.59	.02

Significance levels: ** p < .01

Figure 4.3 is a visual representation of the modified model.

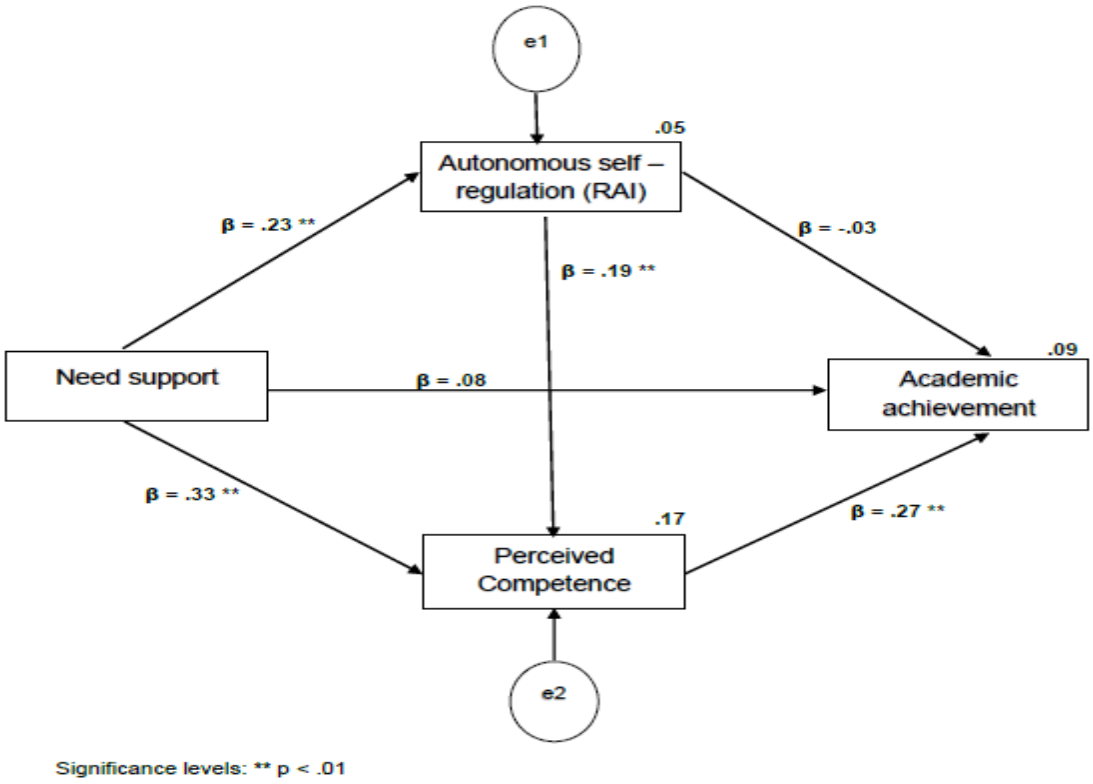

Figure 4.3: Modified Model 1 (Model 1.1)

It is noticeable from figure 4.3 that changes in the independent or exogenous variables accounted for 9% (R^2 = .09) variance in the endogenous variable, academic achievement. This shows that other confounding variables in addition to the independent variables may have influenced academic achievement.

It is clear from table 4.13 that most of the alternative hypotheses relating to direct effects were accepted, except for hypothesis one and hypothesis b. It was unexpected that the additional path or direct effect from autonomous self-regulation (RAI) to academic achievement would be insignificant (hypothesis b). This finding could potentially relate to the unanticipated quasi-simplex structure of the autonomous self-regulation scale (see section 4.2.2.3[a]), the low internal consistency of the external regulation subscale (see section 4.2.2.3) or the age category of participants influencing autonomous self-regulation (RAI) levels.

It was also interesting to note that need support did not significantly predict academic achievement (hypothesis one), even though these variables shared a significant, albeit weak, correlation (r (351) = .17, p <.01). Differently said, need support and academic achievement shared a significant association but changes in need support did not predict changes in academic achievement. The absence of regression in the presence of correlation may be attributed to the influence of additional variables also present in the proposed association (Cohen et al., 2007). It is therefore possible to argue that other mediating variables might have influenced the correlation between need support and academic achievement.

(ii) Indirect effects of model 1.1

Several significant indirect effects were noted. The significance level of indirect effects was established by a two-tailed significance test and the creation of bootstrap confidence intervals. Bootstrapped confidence intervals were estimated using a 95% confidence level based on 5 000 samples (Preacher & Hayes, 2008). My decisions regarding the categorisation of mediation, if present, were based on the recommendations of Zhao et al. (2010) and not Baron and Kenny (1986) (see section 3.8.3.2 in chapter 3).

Hypothesis five was tested by simultaneously investigating whether autonomous self-regulation (RAI) and perceived competence mediated the association between need support (independent variable) and academic achievement (dependent variable). The results indicated a significant (p < .05) mean indirect effect of perceived competence ($a \times b$ = .09), with a 95% confidence interval excluding zero [.04, .14] on the association between need support and academic achievement. Need support and academic achievement was significantly correlated (r = .17, p < .01), indicating complementary mediation according to Zhao et al. 2010. Autonomous self-regulation, however, was not a significant mediator in the association between need support and academic achievement, probably because of the insignificant

direct path from autonomous self-regulation to academic achievement. Hypothesis five was therefore rejected.

In addition, results indicated that autonomous self-regulation (RAI) was a significant ($p < .01$) mean indirect effect ($a \times b = .04$), with a 95% confidence interval excluding zero [.02, .08] in the direct effect of need support (independent variable) on perceived competence (dependent variable). Need support and perceived competence shared a significant correlation ($r = .37$, $p < .01$), indicating complementary mediation (Zhao et al., 2010). Perceived competence, moreover, was a significant ($p < .01$) mean indirect effect ($a \times b = .05$), with a 95% confidence interval excluding zero [.02, .08], in the direct effect of autonomous self-regulation (RAI) (independent variable) on academic achievement (dependent variable). Autonomous self-regulation (RAI) and academic achievement were insignificantly correlated ($r = .26$, $p =$. ns), indicating indirect-only mediation (Zhao et al., 2010).

4.3.2.2 Model 2

(a) Parameter estimates and model fit

The purpose of the second model was to investigate the association between meaningful commitment and autonomous self-regulation as motivational mechanisms in relation to academic achievement. More specifically, the model was created to see whether meaningful commitment could compete with autonomous self-regulation in predicting academic achievement. Results from SAS 9.3 indicated that model 2 (as indicated in figure 4.4) was just identified ($df = 0$), resulting in a perfect fit, allowing for inferences to be made regarding the parameters. The model-fit indices could not therefore be established (Kline, 2010).

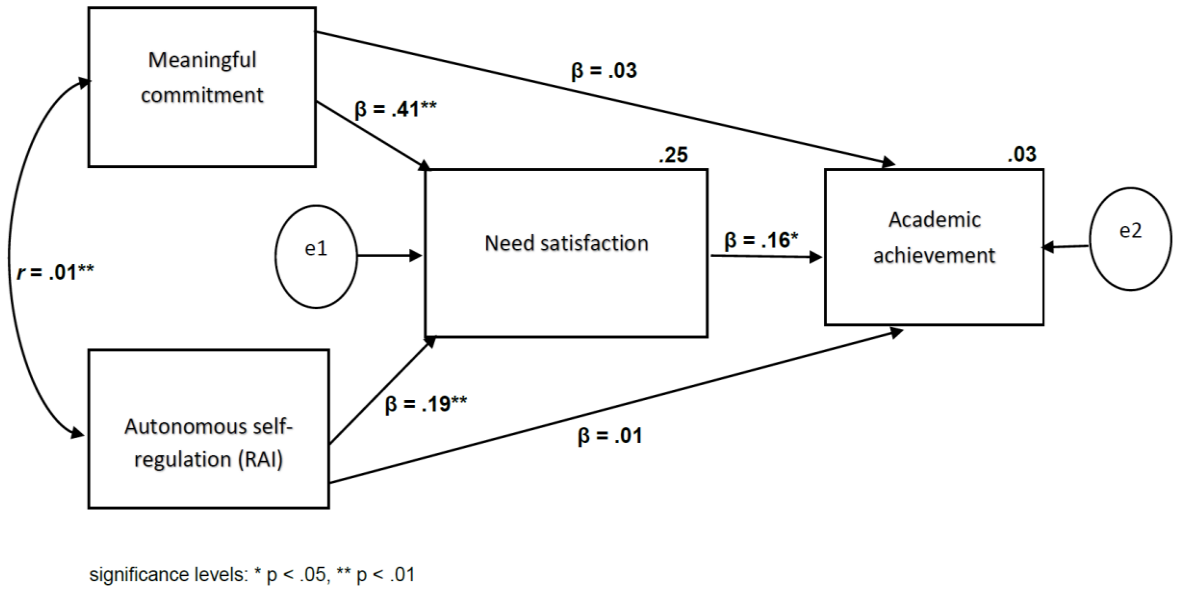

Figure 4.4: Model 2

Table 4.14, contains a description of parameter estimates with the associated hypotheses in model 2

Table 4.14: Parameter estimates of model 2

Alternative hypothesis	Hypotheses accepted or rejected/ significant additional direct effect	Paths estimated	β	*z*	*p*	Total effect
Hypothesis 6	Rejected	Meaningful commitment → academic achievement	.03	.44	.65	.09
Hypothesis 8	Rejected	Autonomous self-regulation (RAI) → academic achievement	.01	.10	.91	.04
Additional direct effect	Significant direct effect	Meaningful commitment → need satisfaction	.41	8.52	.00**	.41
Additional direct effect	Significant direct effect	Autonomous self-regulation (RAI) → need satisfaction	.19	3.96	.00**	.19
Additional direct effect	Significant direct effect	Need satisfaction → academic achievement	.16	2.55	.01*	.16

Significance levels: * p < .05, ** p < .01

It is noticeable in table 4.14 that both alternative hypothesis six and hypothesis eight were rejected, for neither meaningful commitment nor autonomous self-regulation (RAI) significantly predicted academic achievement. Alternative hypothesis 10 was retained, for meaningful commitment and autonomous self-regulation (RAI) shared a positive correlation. The correlation was however weak (r (351) = .27, p < .01), which is suggestive of non-collinearity. This was however further investigated by PCA (see section 4.3.3). It is observable from figure 4.4 that the endogenous variables (independent variables) predicted 3% variance in academic achievement (R^2 = .03), showing that other non-identified factors may also have also influenced academic achievement levels.

Additional significant direct effects were observed in the model, including the significant direct effects from meaningful commitment and autonomous self-regulation (RAI) to need satisfaction. Need satisfaction was, furthermore, also a proximal predictor of academic achievement. The statistical procedures recommended by Meng, Rosenthal and Rubin (1992) were followed in order to determine whether meaningful commitment or autonomous self-regulation (RAI) could predict greater variance in need satisfaction. It was interesting to note that meaningful commitment (z = .43) predicted significantly (p < .01) greater variance in need satisfaction than autonomous self-regulation (RAI) (z = .19). Possible reasons for this finding could relate to the unconventional simplex structure of the self-regulation scale

or the mean age of the participants influencing the extent to which or the manner in which they experience autonomous self-regulation (RAI). This finding also seems to support the importance of meaningful commitment (identity commitments) in SDT motivational processes.

(b) Indirect effects of model 2

Two significant indirect effects were detected by two-tailed significance testing and 95% confidence levels bootstrapping intervals (Preacher & Hayes, 2008). My categorisation of mediation and indirect effects in the additional model was also based on the recommendations of Zhao et al. (2010).

Results showed that need satisfaction was a significant ($p < .05$) mean indirect effect ($a \times b = .06$), with a 95% confidence interval excluding zero [.006, .11] in the direct effect of meaningful commitment (independent variable) to academic achievement (dependent variable). Meaningful commitment and academic achievement were not significantly correlated ($r = .10$, p = ns), indicating non-mediation, but that a significant indirect effect was present from meaningful commitment → need satisfaction → academic achievement. Moreover, need satisfaction was also a significant ($p < .05$) mean indirect effect ($a \times b = .03$), with a 95% confidence interval excluding zero [.002, .06], in the direct effect of autonomous self-regulation (RAI) (independent variable) on academic achievement (dependent variable). Autonomous self-regulation (RAI) and academic achievement were uncorrelated ($r = .06$, p = ns), showing non-mediation, but that a significant indirect effect was present from RAI → need satisfaction → academic achievement.

4.3.3 PRINCIPAL COMPONENT ANALYSIS

4.3.3.1 Purpose of doing a principal component analysis

A principal component analysis (PCA) was conducted to investigate the dimensionality of the meaningful commitment and autonomous self-regulation scales (cf. chapter 3 section 3.8.3.2). We decided to conduct a PCA because the simplex structure of the RAI obtained from the autonomous self-regulation questionnaire, displayed an unconventional simplex structure (see section 4.2.2.3). Correlational results, moreover, indicated that meaningful commitment and intrinsic and identified regulation (see section 4.3.1) shared strong correlations, potentially indicating collinearity.

4.3.3.2 Component extraction

We first needed to determine how many components predicted enough variance in the autonomous self-regulatory questionnaire and meaningful commitment scale. Kaiser's criterion (eigenvalues > 1), was utilised to determine how many components were present (Pietersen & Maree, 2007). We also considered the amount of cumulative variance produced by the identified components (Hatcher & O'Rourke, 2013). To be precise, Hair et al. (2006), argue that a cumulative percentage of 60% or higher is appropriate for social research. Results are indicated in table 4.15.

Table 4.15: Number of components identified

	Eigenvalue	Difference	Proportion of variance	Cumulative variance
1	9.65	7.84	.48	.48
2	1.80	.55	.09	.57
3	1.25	.34	.06	.64
4	.91	.10	.05	.68
5	.81	.06	.04	.72
6	.76	.07	.04	.76
7	.69	.13	.03	.79
8	.56	.04	.03	.82
9	.52	.07	.03	.85
10	.45	.08	.02	.87
11	.37	.02	.02	.89
12	.36	.05	.02	.91
13	.31	.01	.02	.92
14	.30	.02	.01	.93
15	.27	.03	.01	.95
16	.25	.03	.01	.96
17	.22	.02	.01	.98
18	.19	.01	.01	.98
19	.18	.02	.01	.99
20	.16		.01	1.0000

It is clear from table 4.15 that three potential components were identified, because they displayed eigenvalues larger than 1, as per Kaiser's criterion. The cumulative proportion of variance explained by the identified components was satisfactory (< 60%) (Hair et al., 2006). It was surprising that only three components were identified, because the autonomous self-regulation questionnaire consists of four subscales and I therefore expected to find five components, including meaningful commitment.

4.3.3.3 Rotated pattern matrix

The three retained components were subjected to a promax rotation to increase interpretability of results (Costello & Osborne, 2005). As discussed in chapter 3 section 3.8.3, we specifically implemented promax as oblique rotational method, in which it is assumed that components are correlated to each other. The original rotated pattern matrix for the autonomous self-regulation questionnaire and meaningful commitment scale, before any items were deleted is displayed in appendix 8.

Each primary component loading exceeded .45 in the original pattern matrix, and each component contained at least three observed variables, indicating statistical meaningfulness (Young & Pearce, 2007). All the meaningful commitment items, furthermore, loaded on component one, whereas all the identified and intrinsic regulation items loaded on component two. Most of the external and introjected regulation items loaded on component three, except for V51 that loaded on component two, and V60 that displayed a cross-loading. In terms of a continuum of autonomous self-regulation (see chapter 2, section 2.6.4), intrinsic and identified regulation represent autonomous motivation, while external and introjected regulation represent controlled motivation. It therefore seems reasonable to argue that autonomous motivation (i.e., intrinsic and identified regulation) loaded on factor two, whilst most controlled motivation items (i.e., external and introjected regulation) loaded on factor 3. Other SDT researchers, using similar measurements have also reported two structure-model (autonomous and controlled motivation) (e.g. Williams & Deci, 1996, Williams, Grow, Freedman, Ryan & Deci, 1996)

V51 and V60, however, had a negative influence on the simple structure of the pattern matrix, and we therefore needed to decide whether these items should be retained or removed. As discussed in section 4.2.2.3, both the introjected and external subscales presented with moderate to lower levels of internal consistency, and one could perhaps hypothesise that issues identified with V51 and V60 in PCA could have influenced this result.

More specifically, V60, a controlled motivation item, displayed a cross loading between autonomous (.47) and controlled motivation (.45). I reconsidered the item wording of V60 and noticed that I used the word “reduce” in English or “verminder” in Afrikaans, whilst the original item contained the word “threaten”. It is possible to argue that these words could have made it difficult for participants to decide whether the item reflected autonomous or controlled motivation. In retrospect, I should have uses the word “bedreig” the Afrikaans translated version and “threaten” in the English version. We therefore decided to remove this item from subsequent analysis.

Item V51, in addition, loaded on the autonomous motivation component, even though it represents introjected regulation and therefore should have loaded on the controlled motivation component. Item V51 unlike item V60, however, did not pose any translational or item wording problems. It was intriguing to note that the South African learners in the present sample reported that “I think that participating in academic activities is part of what learners are supposed to do” relate to autonomous and not controlled motivation.

We conducted additional principal component analyses (see appendix 9) and correlational analyses (see appendix 10) to examine the effects on results when removing both V51 and V60 or just V60, to make an informed decision about whether we should retain or remove V51. The additional principal component analysis results indicated that the removal of both V60 and V51, only had a modest effect on loading sizes. Additional correlational analyses results, moreover, demonstrated that the removal of both V51 and V60 led to a slight increase in correlation sizes between measured variables, but in general did not

affect significance levels. In one instance, the removal of both V60 and V51 led to a decrease in significance level from >.01 to >.05, in the association between controlled motivation and need satisfaction. The association between controlled motivation and need satisfaction, nonetheless, remained significant. We decided, based on these findings, to retain V51. We also wanted to ensure that we have included as much of the original items of the autonomous self-regulation questionnaire as possible, in order to make findings from this study comparable to other existing studies. We retained V51 a controlled motivation item, as was intended originally, for the same reason. Table 4.16 contains the final pattern matrix after V60 have been removed.

Table 4.16: Revised rotated pattern matrix, excluding V60

			Component 1	Component 2	Component 3
V40	Meaningful commitment	Being a learner allows me to express myself completely.	***.58***	.06	-.13
V41	Meaningful commitment	My approach to my academic activities reflects who I am as a person.	***.72***	-.03	-.04
V42	Meaningful commitment	My participation in academic activities contribute to shaping me as a person.	***.58***	.16	.02
V43	Meaningful commitment	I am the kind of person who thrives on participating in academic activities.	***.79***	.09	.04
V44	Meaningful commitment	Participating in academic activities is a central aspect of who I am.	***.81***	.05	.07
V45	Meaningful commitment	Academic activities lend meaning to my life.	***.73***	.05	.12
V46	Meaningful commitment	I express myself through my participation in academic activities.	***.81***	.10	.01
V47	Meaningful commitment	Participating in academic activities is an important part of my life.	***.62***	.22	.05
V50	Autonomous motivation	It's fun to participate in academic activities at school	.29	***.63***	-.11
V52	Autonomous motivation	I value the experience I have when I participate in academic activities at school	.01	***90***	-.13
V53	Autonomous motivation	It is satisfying to be able to participate in academic activities at school	.13	***.80***	-.05
V56	Autonomous motivation	I really value how participating in academic activities enriches school experience.	.16	***.67***	.15
V57	Autonomous motivation	I believe that participating in academic activities is an important part of the school experience	.04	***.74***	.12

V59	Autonomous motivation	I really enjoy participating in academic activities at school	.34	***.60***	-.04
V49	Controlled motivation	Others would get mad at me if I did not participate in academic activities at school	. 20	-.44	***.72***
V51	Controlled motivation	I think that participating in academic activities is part of what learners are supposed to do	.02	***.75***	.08
V54	Controlled motivation	I would feel guilty if I did not participate in academic activities at school	-.20	.26	***.81***
V55	Controlled motivation	Others make me feel good about myself when I participate in academic activities at school	.13	.17	***.56***
V58	Controlled motivation	I would feel bad about myself if I did not participate in academic activities at school	-07	.24	***.76***

The revised pattern matrix presented a simple structure. All the primary component loadings, for instance, exceeded .58, which is higher than the .32 threshold recommended by Young and Pearce (2007), and each component contained at least four items that were conceptually similar (i.e., meaningful commitment, autonomous motivation and controlled motivation). Costello and Osborne (2005), furthermore, recommend that secondary component loadings (i.e., second highest loading) should not exceed .32 and Worington and Whittaker (2006) mention that there should be a gap of at least .15 between primary and secondary loadings. Indeed, secondary component loadings as displayed in table 4.16 were generally lower than primary loadings, also indicating a simple structure. One autonomous motivation item (V51), loaded slightly higher (.34) on a secondary component, meaningful commitment. The primary component loading was nevertheless .60 meaning that the difference between primary and secondary loadings exceeded .15, still indicating a simple structure.

As mentioned before, the strong correlation between meaningful commitment and autonomous motivation regulatory subtypes (intrinsic and identified regulation) raised collinearity concerns. The simple structure of the component matrix (i.e., each operationalised construct loaded on a specific component in a unique manner) however, seems to suggest that autonomous motivation and meaningful commitment resembled unique constructs. Theoretically this makes sense, because as discussed in my conceptual framework (see chapter 2, section 2.9.4), I propose that meaningful commitment occurs as part of higher-level self-regulation whilst autonomous motivation occurs as part of lower-level behavioural self-regulation. Furthermore, I reported that meaningful commitment accounted for more variance in basic psychological need satisfaction than autonomous self-regulation in Model 2, which could suggest that these variables influence basic psychological needs in an unique manner (cf. section 4.3.2.2).

The fact that only two components were identified from the autonomous self-regulation questionnaire (i.e., autonomous and controlled motivation) seems to suggest that it would be more fruitful to consider

the independent effects autonomous and controlled motivation than a RAI composite score in subsequent analysis. As mentioned before, several SDT researchers have also considered the independent effects of autonomous and controlled motivation in the education domain (e.g. Vansteenkiste, Zhou, et al., 2005; Zhou et al., 2009). A revised correlational matrix between all measured variables, in which autonomous self-regulation and its subscales were replaced by autonomous and controlled motivation, is displayed in appendix 11.

4.3.4 ADDITIONAL PATH ANALYSIS

4.3.4.1 Rationale and overview of additional path analysis

We conducted additional path analyses, with the same data used in previous models, to answer some questions that were left unanswered in model 1.1 and model 2. Firstly, as mentioned in the previous section, PCA results indicated that it would be more appropriate to consider the independent effects of autonomous and controlled motivation in the present study than a RAI score. Model 1.1 however, included RAI, and we therefore needed to create an additional model with autonomous motivation. Secondly, model 2 delivered important insight with regards to the association between meaningful commitment, need support and RAI but did not include all of the variables that were part of model 1.1. This made it difficult to understand how meaningful commitment is related to all other SDT variables included in the present study (i.e., perceived competence and need support). We therefore needed to create an additional model, with perceived competence and need support.

Model 1.1 (cf. section 4.3.2.1 (b)) was therefore modified, by replacing RAI with ***autonomous motivation*** to create ***model 1.2*** (see section 4.3.5.2 (a)). We only included autonomous motivation in subsequent path analyses, and not controlled motivation, for the following reasons: (i) controlled motivation displayed weaker correlations with all other variables than autonomous motivation (need support r = .25 vs. .46; meaningful commitment r = .51 vs. .75; perceived competence r = .34 vs. .57, need support r = .18 vs. .46) (ii) controlled motivation was not correlated with academic achievement (r (351) = .07, *ns*), whereas autonomous motivation was (r (351) = .14, p < .01), and, (iii) the introjected and external regulation subscales (i.e., components of controlled motivation), displayed unsatisfactory internal consistency levels (see section 4.2.2.2).

We also modified model 1, by replacing RAI/autonomous motivation with ***meaningful commitment***, to create ***model 1.3*** (see section 4.3.5.2 (b))***.*** We created model 1.3, to examine the influence of meaningful commitment on other variables included in model 1, but excluded from model 2 (i.e., need support, perceived competence). In other words, we created model 1.3 so that we could make informed decisions about which variables and paths should be included in model 3. Both model 1.2 and 1.3 displayed improved model-fit indices in comparison to model 1.1 that included RAI. The final version of ***model 3*** (see section 4.3.5.3 (a)), produced satisfactory model-fit indices and included meaningful commitment, need support, autonomous motivation, perceived competence and academic achievement.

4.3.4.2 Secondary modifications to model 1

(a) Model 1.2 - RAI replaced with autonomous motivation

Figure 4.5, is a visual representation of model 1.2 (see section 4.2.1, for model 1.1), in which RAI is replaced with autonomous motivation. Model modification decisions were once again based on existing SDT theoretical insight (Hancock & Mueller, 2013) for it made sense that autonomous motivation, like RAI, would predict perceived competence and academic achievement. Model 1.2 like model 1.1 was just identified or saturated (*df* = 0). The resulting model-fit indices for the adapted model could therefore not be determined (x^2)= 0.00, *df*, = 0, PLOSE, .00, IFI = 1, AGF = 0). I expected that similar directs and indirect effects that were identified in model 1.1 would also be identified in model 1.2.

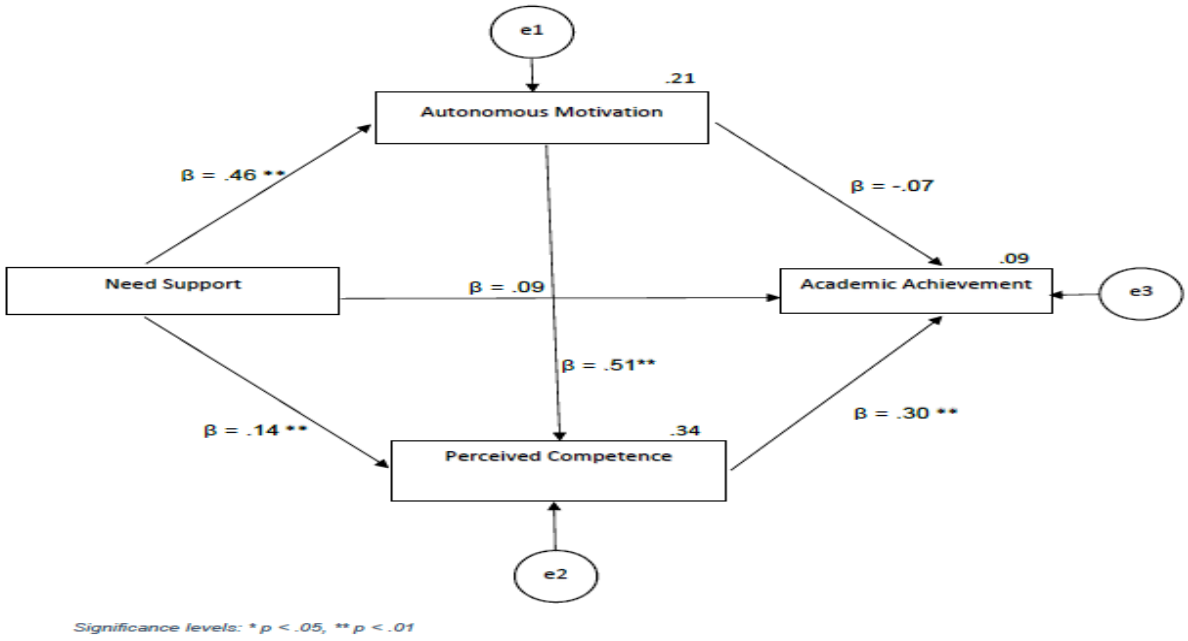

Figure 2.5 Path model: Model 1.2

Table 4.17 contains a comparative summary of the parameter estimates of model 1.1 and model 1.2.

Table 4.17: Comparative summary of model 1.1 and 1.2 parameter estimates

Model 1.1				Model 1.2			
Paths estimated	**β**	***z***	***p***	**Paths estimated**	**β**	***z***	***p***
Need support → academic achievement	.08	1.35	.17	Need support → academic achievement	.09	1.59	.11

Need support → RAI	*.23*	4.35	.00**	Need support →autonomous motivation	*.46*	9.72	.00**
RAI → perceived competence	*.19*	3.79	.00**	Autonomous motivation → perceived competence	*.51*	10.33	.00**
Perceived competence → academic achievement	.27	4.80	.00**	Perceived competence → academic achievement	.30	4.74	.00**
Need support → perceived competence	*.33*	6.62	.00**	Need support → perceived competence	*.14*	2.88	.00**
RAI → academic achievement	- .03	-.53	.59	Autonomous motivation → academic achievement	- .07	-1.11	.27

*Significance levels: * p < .05, ** p < .01*

It is apparent from table 4.17, that similar ***direct effects*** were identified in both models, with changes in path coefficient or beta weights. More specifically, the beta weights or path coefficients from (i) autonomous motivation to perceived competence and (ii) need support to autonomous motivation increased, whereas the path coefficient between need support and perceived competence decreased in model 1.2. Beta weights in path models represent the amount of change in a dependent variable for every one standard deviation change in the independent variable, while controlling for other independent variables (Olobatuyi, 2006). Hence, it appears as if autonomous motivation had a more decisive influence on dependent variables than RAI. The increase in path coefficients/beta weights were not surprising, because as mentioned before, autonomous motivation unlike RAI does not contain any controlled items, and is therefore a more condensed representation of autonomous motivation

It was, however, interesting to note that autonomous motivation did not significantly predict academic achievement, despite being correlated. We therefore expected to identify several significant indirect effects. Table 4.18 provides a comparative summary of the indirect effects identified in model 1.1 and 1.2.

Table 4.18: Comparative table of indirect effects between model 1.1 and 1.2

Model 1.1				***Model 1.2***			
Indirect effect	**Mean indirect effect**	**95% Confidence interval and *p***	**Total effect**	**Indirect effect**	**Mean indirect effect**	**95% Confidence interval and *p***	**Total effect**
Need support → ***RAI*** →	.04	[.02, .08] $p < .01$	.37	Need support → ***autonomous***	.23	[.18, .31] $p < .01$	.37

perceived competence				***motivation*** → perceived competence			
Need support → **perceived competence** → academic achievement	.09	[.04, 14] $p < .05$	.17	Need support → **perceived competence** → academic achievement	.08	[.02, .14] $p < .01$	.17
RAI → ***perceived competence*** → academic achievement	.05	[.02, .08] $p < .01$	.02	Autonomous motivation → ***perceived competence*** → academic achievement	.15	[.09, .22], $p < .01$	.08

The total effect between an independent and dependent variable, is the sum of direct and ***indirect effects*** (Kline, 2010). I wanted to establish how much indirect effects contributed to total effects in each model, and therefore divided each significant indirect effect by its associated total effect (Shrout & Bolger, 2002). Autonomous motivation, like RAI, also mediated the significant association between need support and perceived competence ($r = .37$, $p < .01$). The total effect of need support → perceived competence in model 1.1 was (.33) + (.04) = .37, meaning that autonomous motivation as indirect effect contributed 2.7% of the total effect [(.04) ÷ (.37) x 100 = 2.7]. The total effect between need support and perceived competence in model 1.2 was (.14) + (.23) = 37, and perceived competence as indirect effect, therefore, contributed to 62.1 % to the total effect [(.14) ÷ (.37) x 100 = 62.1]. Autonomous motivation, therefore, contributed more to the overall total effect between need support and perceived competence in model 1.2 than RAI in model 1.1.

Furthermore, perceived competence, once again, mediated the significant association between need support and academic achievement ($r = .17$, $p < .01$) in model 1.2. Perceived competence as mediator displayed the same mean indirect and total effect sizes in both models, but was more significant in model 1.1 ($p < .05$ vs. $p < .01$). A significant indirect effect was also identified from RAI to perceived competence to academic achievement in model 1.1. There was no evidence for mediation, because RAI and academic achievement was uncorrelated. Autonomous motivation and academic achievement do however share a correlation ($r = .14$, $p < .01$), and perceived competence, therefore, mediated the association between autonomous motivation and academic achievement in model 1.2.

Model 1.2, furthermore, displayed higher squared multiple correlations in relation to autonomous motivation and perceived competence, than model 1.1. Need support as exogenous variable, for instance, accounted for 21% ($R^2 = .21$) ***variance*** in autonomous motivation versus the 5% ($R^2 = .05$) variance shown in RAI in the model 1.1. Need support and autonomous motivation, furthermore accounted for 32% variance in perceived competence, in comparison to the 17% indicated in the model 1.1. All exogenous variables in this model like model 1.1, however, only accounted for 9% variance in

academic achievement. This means, once again, that other factors not included in the model may also have influenced academic achievement.

Table 4.19 contains a comparative summary of the fit indices used to evaluate which model (Model 1.1 or 1.2) displays best fit with data.

Table 4.19: AIC and ECVI fit indices for model 1.1 and 1.2

Model	AIC	BCC	BIC	CAIC	ECVI
Default model (Model 1.1)	20.0	20.29	58.61	68.61	.057
Default model (Model 1.2)	20.0	20.29	58.61	68.61	.057
Saturated model (Model 1.1)	20.0	20.29	58.61	68.61	.057
Saturated model (Model 1.2)	20.0	20.29	58.61	68.61	.057
Independence model (Model 1.1)	***126.02***	***126.13***	***141.46***	***145.46***	***.36***
Independence model (Model 1.2)	***271.09***	***271.20***	***286.53***	***290.53***	***.78***

It can be deduced from table 4.19 that both models seem to fit the data well, for there is no difference between the AIC, BCC, BIC and ECVI fit indices with regards to the default and saturated models (cf. chapter 3, section 3.8.3.3). The independence model fit indice values of model 1.2 were however further removed from the default and saturated models than model 1.1, which according to Jackson et al. (2005) suggests that model 1.2 displayed an improved fit of data.

(b) Model 1.3 – replacing autonomous motivation with meaningful commitment

An important objective of the present study, is to examine the role of meaningful commitment in SDT. An additional SDT model, including meaningful commitment in the place of autonomous motivation was therefore also created (i.e., model 1.3). I based model modification decisions on existing theoretical insight and research findings (Hancock & Mueller, 2013). Firstly, it seemed reasonable to propose that need support would predict meaningful commitment, because as discussed in chapter 2 section 2.9.4.1, I propose that long-term exposure of basic psychological need support may influence learner's identity self-descriptions (e.g. I am a competent person) and future identity goals (e.g. I want to be a competent learner) which in turn increase meaningful commitment. Furthermore, several identity theorists argue that feedback from other individuals influence the content of identity self-descriptions (Baumeister, 1991; Oyserman, 2015).

Secondly, I also argue that meaningful commitment predicts perceived competence. More precisely, from a meaningful commitment perspective, one could argue that people feel more competent when they pursue meaningful goals, because it leads to a general sense of coherence and predictability in life (Heine et al., 2006; Martella & Steger, 2016). Eccles (2009), additionally, reports that people feel more competent when they are engaged in subjectively meaningful tasks (see also chapter 5, section 5.2.2.3).

Lastly, I also propose that meaningful commitment predicts academic achievement. I argue in my conceptual framework that learners who experience meaningful commitment display higher levels of behavioural commitment (e.g. behavioural investment), which in turn result in academic achievement (see chapter 2, section 2.9.4). Moreover, it is indicated in literature that people are more motivated when their goals are identity related (Oyserman & Destin, 2010; Oyserman, 2007, Roeser et al., 2006) and that behavioural investment leads to academic achievement (Reyes, Brackett, Rivers, White & Salovey, 2012). Figure 4.6 is a visual representation of model 1.3.

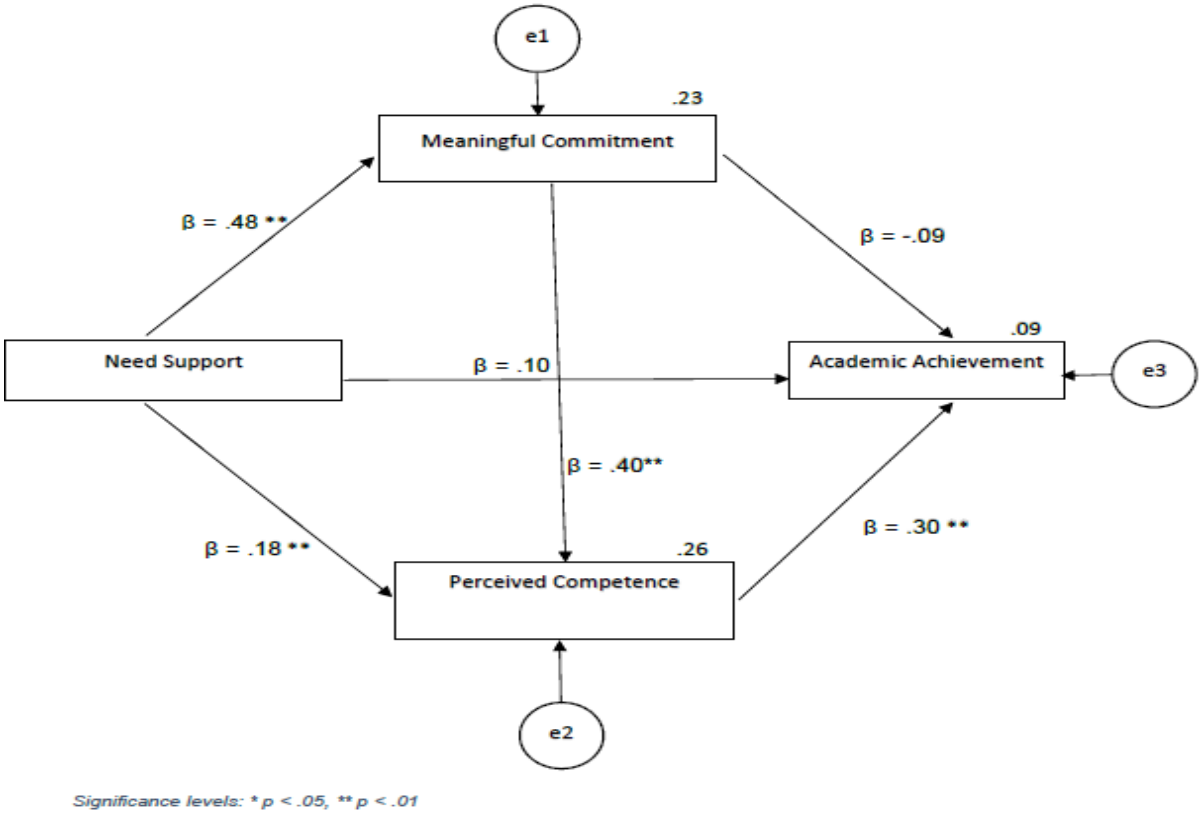

Figure 4.6 Path model – Model 1.3

Model 1.3 like model 1.1 and 1.2, was just identified or saturated (*df* = 0). It is therefore, as is the case with all just identified models, impossible to determine model-fit indices ((x^2)= 0.00, *df*, = 0, PLOSE, .00, IFI = 1, AGF = 0). Table 4.20, on the following page, contains a comparative summary of parameter estimates of models 1.2 and 1.3.

Table 4.20 Comparative summary of model 1.2 and 1.3 parameter estimates

Model 1.2				Model 1.3			
Paths estimated	**β**	***z***	***p***	**Paths estimated**	**β**	***z***	***p***
Need support → academic achievement	.09	1.59	.11	Need support → academic achievement	.10	1.77	.08
Need support → **autonomous motivation**	***.46***	9.72	.00**	Need support → **meaningful commitment**	***.48***	10.26	.00**
Autonomous motivation → perceived competence	***.51***	10.33	.00**	**Meaningful commitment** → perceived competence	***.40***	7.62	.00**
Perceived competence → academic achievement	.30	4.74	.00**	Perceived competence → academic achievement	.30	5.06	.00**
Need support → perceived competence	***.14***	2.88	.00**	Need support → perceived competence	***.18***	3.48	.00**
Autonomous motivation → academic achievement	**- .07**	-1.11	.27	**Meaningful commitment**→ academic achievement	**- .09**	-1.51	.07

*Significance levels: * p < .05, ** p < .01*

The results displayed in table 4.20 indicate that similar ***direct effects*** and path coefficients sizes were present in both model 1.2 and 1.3. This is interesting, because PCA results (see section 4.3.3) suggest that meaningful commitment and autonomous motivation represent unique constructs. Results indicated in table 4.20, furthermore, indicate that the additional direct effects from (i) need support to meaningful commitment and (ii) meaningful commitment to perceived competence was, as expected significant. Meaningful commitment, like autonomous motivation, in addition did not significantly predict academic achievement. Table 4.2, provides a comparative summary of the indirect effects identified in model 1.2 and 1.3.

Table 4.21: Comparative table of indirect effects between model 1.2 and 1.3

Model 1.2				***Model 1.3***			
Indirect effect	**Mean indirect effect**	**95% Confidence interval and *p***	**Total effect**	**Indirect effect**	**Mean indirect effect**	**95% Confidence interval and *p***	**Total effect**
Need support → ***autonomous motivation***→	.23	[.18, .31] *p* < .01	.37	Need support → ***meaningful commitment***	.19	[.14, .25] *p < .05*	.37

perceived competence				→ perceived competence			
Need support → **perceived competence** → academic achievement	.08	[.02, .14] $p < .01$	.17	Need support → **perceived competence** → academic achievement	.08	[-.007, .15] $p <$. *ns*	.17
Autonomous motivation → ***perceived competence*** → academic achievement	.15	[.09, .22], $p < .01$	.07	Meaningful commitment → ***perceived competence*** → academic achievement	.12	[.07, .18], $p < .05$	.02

Several differences in terms of ***indirect effects*** are noticeable in the two models. Overall, it seems that replacing autonomous motivation with meaningful commitment, led to a decrease in indirect effect size. Perceived competence, for example, did not significantly mediate, nor was a significant indirect effect in the association between need support and academic achievement in model 1.3. The association between meaningful commitment and academic achievement was, furthermore, not significant ($r = .10$, p = ns), and perceived competence, therefore, did not mediate the association between meaningful commitment and academic achievement. A significant indirect effect was however identified from meaningful commitment to perceived competence to academic achievement.

Meaningful commitment, like autonomous motivation, moreover, mediated the significant association between need support and perceived competence ($r = .29$, $p < .01$). It is, however, noticeable that the significance level of meaningful commitment as mediator was lower than that of autonomous motivation ($p <.01$ to $p < .05$). It also appears that autonomous motivation contributed more towards the total effect between need support and perceived competence than meaningful commitment. More specifically, I reported that autonomous motivation contributed to 62.1% of the total effect between need support and perceived competence by using procedures discussed by Shrout and Bolger, (2002), whereas meaningful commitment contributed 51.35 % to the same total effect [(.19) ÷ (.37) = 51.35].

Need support as exogenous variable, in model 1.3, however, accounted for 23% ($R^2 = .23$) ***variance*** in meaningful commitment versus the 21% ($R^2 = .21$) variance by autonomous motivation in model 1.2. Need support and meaningful commitment, moreover, explained 26% variance in perceived competence, whereas need support and autonomous motivation accounted for 34% variance in perceived competence. All the exogenous variables in model 1.3 also only accounted for 9% variance in academic achievement. Table 4.22 on the following page contains summarised indices of model 1.2 or 1.3.

Table 4.22: AIC and ECVI fit indices for model 1.2 and 1.3

Model	AIC	BCC	BIC	CAIC	ECVI
Default model (model 1.2)	20.0	20.29	58.61	68.61	.057
Default model (model 1.3)	20.0	20.29	58.61	68.61	.057
Saturated model (model 1.2)	20.0	20.29	58.61	68.61	.057
Saturated model (model 1.3)	20.0	20.29	58.61	68.61	.057
Independence model (model 1.2)	***271.09***	***271.20***	***286.53***	***290.53***	***.775***
Independence model (model 1.3)	***240.95***	***241.06***	***256.39***	***260.39***	***.688***

It is noticeable from table 4.22 that both models, seem to fit the data well, as there is no difference between the AIC, BCC, BIC and ECVI fit indices in the default and saturated models (cf. chapter 3, section 3.8.3.3). It is however evident that the independence model, of model 1.2 is slightly further removed from the default and saturated model than model 1.3, implying that model 1.2 displays improved fit with data (Jackson et al., 2005).

In sum, it appears that all the modified model 1 versions (i.e., models 1.1, 1.2 and 1.3) displayed satisfactory model-fit indices. Both model 1.2 and 1.3 produced larger path coefficients than model 1.1. Importantly, models 1.2 and 1.3 displayed similar direct effects even though I have demonstrated through PCA that meaningful commitment and autonomous motivation represent unique constructs. Models 1.2 and 1.3, nevertheless, displayed differences in indirect effects, and one could perhaps argue that meaningful commitment like autonomous motivation, fulfils an important function in a SDT informed model (because it displays similar direct effects), but through different mechanisms (due to differences in indirect effects). We, however, needed to assess all of these constructs together in one path model to investigate these claims further.

4.3.4.3 Model 3

We originally created model 3, to include the same variables and paths that were part of the previously discussed model 1 versions (i.e., model 1.1, 1.2 and 1.3). A visual representation of this modified model appears in appendix 12. This modified model, however, delivered poor model-fit indices ((x^2)= 215.61, *df*, = 2, RMSEA = .55, IFI = .62, AGF = .36, CFI = .62), which made it impossible to generate any valid inferences about its parameter estimates.

We therefore modified this model to create an additional model (i.e., model 3), as displayed in figure 4.7 on the following page. This model was over-identified (*df* = 3), meaning that there were more equations

available than needed to calculate unique solutions for each parameter (Raykov & Marcoulides, 2006). Some authors argue that an over-identified model is preferable over a just-identified model, because it allows for a more parsimonious fit of data and more complete hypothesis testing (Keith, 2015; Olobatuyi, 2006).

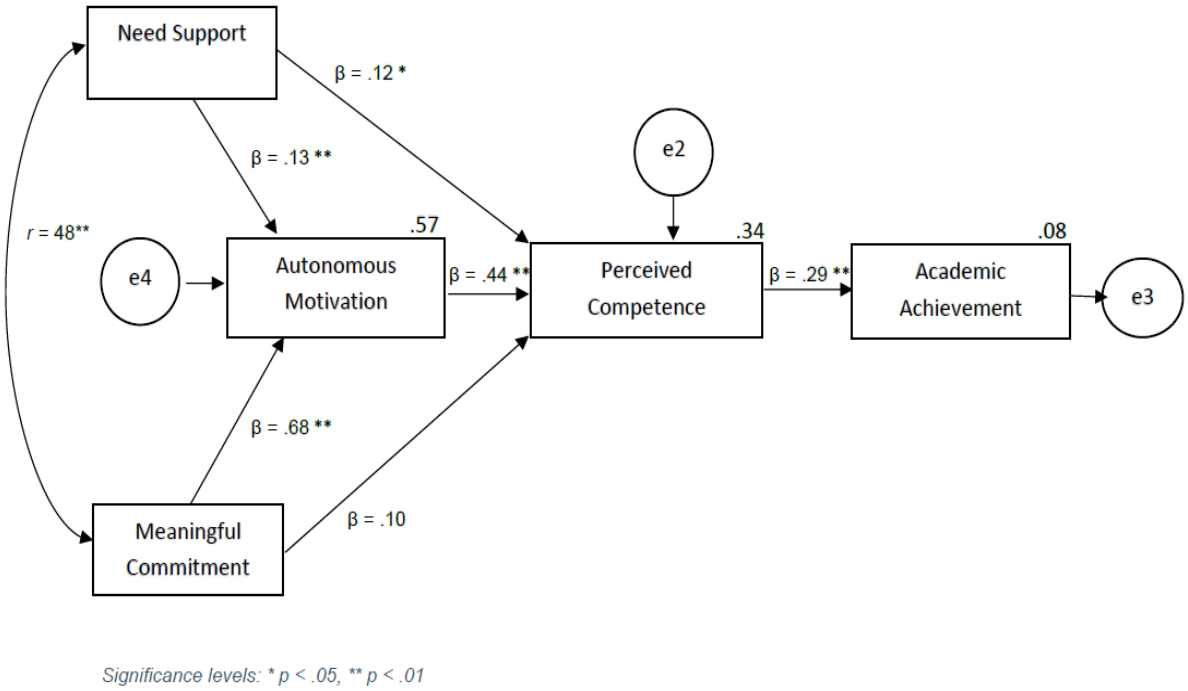

Figure 4.7 Model 3

I shall now discuss reasoning behind the selection of variables and paths in model 3. We created the path from need support → autonomous motivation → perceived competence → academic achievement, because it was significant in model 1.2, hence making the inclusion thereof in model 3 defensible. We also specifically included a path from perceived competence to academic achievement, for it was the only variable that has consistently predicted academic achievement in all the previous model 1 versions (see sections 4.3.2.1, 4.3.5.2 (a) and (b)).

We also included autonomous motivation and not RAI in model 3, because: (i) the simplex structure of the RAI in the present study (see section 4.2.2.3) was not completely convincing, (ii) PCA results indicated that it would be more appropriate to consider the independent effects of autonomous and controlled motivation than RAI and finally (ii) it was clear that model 1.2, including autonomous motivation, displayed improved fit with data (i.e., AIC and ECVI indices) (see table 4.22).

We placed meaningful commitment, together with need support, on the far left-hand side (i.e., predictor variables of autonomous motivation), because as discussed in my conceptual framework (cf. section 2.9.4.3 in chapter 2), I propose that meaningfulness like autonomy, competence and relatedness is an important need, that help people to experience autonomous motivation. More specifically, I propose that learners who commit to intermediate and lower-level goals because they feel that it is related to their

future identity goals, will experience increased internalisation and autonomous motivation (see also chapter 5 section 5.2.4.1). Additionally, autonomous motivation and meaningful commitment, share a strong correlation (*r* = .75), display similar results in models 1.2 and 1.3 (section 4.3.5.2 (a) and (b)), but resemble unique constructs per PCA results (section 4.3.3). It therefore seems probable from an analytical point of view, that these constructs would be associated with each other in one path model (i.e., model 3).

We also proposed that meaningful commitment would predict perceived competence, because meaningful commitment and perceived competence display a moderate correlation (*r* = .48), and meaningful commitment predicted perceived competence in model 1.3 (see section 4.3.5.2 (b)). Furthermore, as discussed in section 4.3.5.2 (b), I propose that meaningful commitment predicts perceived competence because the pursuit of meaningful or identity related goals results in coherence and predictability in life.

Model 3 displayed satisfactory ***model-fit*** indices. The chi square value was low ((x^2)= 215.61) and statistically insignificant and all other absolute (AGFI = .99 and RMSEA = .03) and relative fit indice (IFI =.99 and CFI = .99) values were acceptable (Norman & Streiner, 2003). It was, therefore, possible to make valid inferences concerning direct and indirect effects. Table 4.25, offers a summary of the parameter estimates of model 3.

Table 4.23: Parameter estimates model 3

Paths estimated	β	*z*	*p*
Need support → autonomous motivation	.13	3.33	.00**
Meaningful commitment→ autonomous motivation	.68	17.09	.00**
Need support → perceived competence	.12	2.47	.01*
Meaningful commitment → perceived competence	.10	1.49	.14
Autonomous motivation → perceived competence	.44	6.65	.00**
Perceived competence → academic achievement	.29	5.68	.00**

*Significance levels: * p < .05, ** p < .01*

It is noticeable from table 4.23 that most of the ***direct effects*** of model 3 was significant. It was interesting to note that meaningful commitment predicted autonomous motivation (β = .68) to a larger extent than need support predicted meaningful commitment (β = .13). One could argue, based on my conceptual framework (chapter 2 section 2.9.4), that meaningful commitment as long-term higher order self-regulatory process, had a greater influence on autonomous motivation than need support, which occurs as part of lower-level self-regulation (see also chapter 5, section 5.2.4). Once again, it is important to mention that PCA results indicated that meaningful commitment and autonomous motivation represent unique constructs.

Meaningful commitment did not significantly predict perceived competence in model 3. This was unexpected because meaningful commitment and perceived competence displayed a strong correlation (r = .48), and meaningful commitment did predict perceived competence in model 1.3 (4.3.5.2 (b)). As mentioned before, the presence of correlation and absence of prediction is often indicative of indirect or mediated effects (Cohen et al., 2007). Table 4.24 contains a summary of all the indirect effects identified in model 3

Table 4.24: Indirect effects identified in model 3

Indirect effect	Standardized indirect effect	95% Confidence interval	*p*	Total effect
Need support → ***autonomous motivation*** → perceived competence	.06	[.02, .10]	.00**	.18
Meaningful commitment → ***autonomous motivation*** → perceived competence	.30	[.21, .44]	.00**	.40
Meaningful commitment →***perceived competence*** →academic achievement	.12	[.08, .16]	.00**	.12
Need support → **perceived competence** → academic achievement	.05	[.02, 09]	.01*	.05
Autonomous motivation → ***perceived competence*** → academic achievement	.13	[.08, .20]	.00**	.13

*Significance levels: * p < .05, ** p < .01*

It is shown in table 4.24 that several significant indirect effects were identified. More specifically, (i) need support had an influence on perceived competence which in turn influenced academic achievement, (ii) meaningful commitment had an impact on perceived competence, which also influenced academic achievement and (iii) autonomous motivation influenced perceived competence, which also influenced academic achievement. There was no third path specified in any of the aforementioned indirect effects (e.g. meaningful commitment →academic achievement), and I could therefore not assess if mediation was present.

Autonomous motivation was, however, a complementary mediator in the significant associations between (i) need support and academic achievement (r = .17, p < .01) and (ii) meaningful commitment and perceived competence (r = .48, p < .01). The total effect of the association between need support and perceived competence in this model was (.12) + (.06) = .18, and autonomous motivation as indirect effect, therefore, contributed to 34.33 % to the total effect [(.06) ÷ (.18) x 100 = 34.33%]. The association between meaningful commitment and perceived competence had a total effect of (.10) + (.30) = .40, and autonomous motivation as mediator, therefore, contributed to an impressive 75 % to the total effect [(.30) ÷ (.40) x 100 = 75%].

Need support and meaningful commitment, furthermore, accounted for a noteworthy 57% (R^2 = .57) ***variance*** in autonomous motivation. These three variables in turn also contributed to 34% variance in perceived competence. All the exogenous variables however only accounted for 8% variance in academic achievement, which shows that other variables not included in the present study also had an influence on academic achievement.

4.4 SUMMARY OF FINDINGS

I reported the findings of the present study in chapter 4. A descriptive analysis of the present sample indicated that the majority of the sample was white, had a mean age of 17.37 years, received education in their home language, set learning goals for themselves and had future careers in mind. Participants reported average levels of all measured variables, with the exception of higher levels of perceived competence. The internal consistency of all measurements used in the present study was satisfactory to high, with the exception of the external regulation subscale. Responses from the participants on all of the measurements appeared to be normally distributed, as shown by acceptable skewness and kurtosis statistics.

An inferential analysis of data was conducted in an attempt to test hypotheses and answer research questions. A correlational analysis was done to establish whether a zero-order correlation existed between variables, which in turn would have allowed for regression analysis through path analysis. Most of the independent variables were correlated with each other, although only moderately in most instances, implying that collinearity was likely not an issue. It was however concerning that the autonomous self-regulation questionnaire subscales displayed an unconventional simplex structure (i.e., subscales displaying a positive instead of a negative correlations). The meaningful commitment and the intrinsic and identified regulatory subscales, furthermore, shared strong correlations, suggesting that collinearity might have been an issue.

A principal component analysis (PCA) was therefore conducted to investigate the dimensionality of the autonomous self-regulation questionnaire and meaningful commitment scale. Three components were identified, and a promax rotation indicated that component one contained meaningful commitment items, component two intrinsic and identified items (i.e., autonomous motivation) and component three external and introjected items (i.e., controlled motivation). Item V60 was removed and V51 retained, to create a simple structure. We concluded, based on PCA results, that meaningful commitment and autonomous motivation represented unique constructs and that it would be more productive to consider the independent influence of autonomous and controlled motivation, instead of a RAI composite score in subsequent analysis.

We, nevertheless, conducted an initial path analysis with two separate models, model 1 and model 2, to test my original hypotheses. The purpose of model 1 was to establish whether a SDT model of motivation was applicable the present South African sample. The original hypothesised model was originally

modified (i.e., model 1.1) by including additional paths and hypothesis to improve model-fit indices, in order to allow for valid parameter estimation. Most of the hypotheses concerning direct effects were accepted, with the exception of the insignificant direct effect between (i) autonomous self-regulation (RAI) and academic achievement and (ii) need support and academic achievement. I argued that the insignificant direct effect between autonomous self-regulation (RAI) and academic achievement was due to the unconventional quasi-simplex structure of the self-regulation scale which was perhaps due to the mean age of participants influencing the extent to which they engaged in self-regulatory behaviour. The insignificant direct effect from need support to academic achievement was unexpected, because these variables shared a correlation, which in turn suggested the presence of mediators. Several indirect effects were, indeed, observed in the model 1.1. I mentioned that perceived competence mediated the association between need support and academic achievement. Autonomous self-regulation (RAI) also partially mediated the association between need support and perceived competence, and an indirect effect was present where perceived competence influenced RAI which in turn had an impact on academic achievement.

Secondary path analyses were also conducted. Model 1.2 included autonomous motivation in the place of RAI with autonomous motivation. We specifically included autonomous motivation and not controlled motivation because, (i) a secondary correlational analysis showed that controlled motivation was not correlated with academic achievement, (ii) it displayed weaker correlations with other variables than autonomous motivation and (iii) the external and introjected regulation subscales displayed poorer internal consistency levels. Model 1.1 and 1.2 generally produced similar direct, indirect and mediated effects. The path coefficients, indirect effect sizes as well as squared multiple correlations (R^2) were however larger or more pronounced in model 1.2 including autonomous motivation, than in model 1.1 including RAI. This was not surprising because autonomous motivation, unlike RAI, does not have any controlled motivation items, meaning that it is a much more concentrated representation of autonomous motivation. Comparative fit indices, however, showed that model 1.2 displayed improved fit of data.

The originally hypothesized model 2 was also tested with the purpose of establishing whether and to what extent meaningful commitment contributes to academic achievement and the association thereof with other SDT variables. Findings from this model indicated that neither meaningful commitment nor autonomous self-regulation (RAI) predicted academic achievement. Both variables however predicted need satisfaction, which was a proximal predictor of academic achievement. Need satisfaction was therefore a mediator in the association between (i) meaningful commitment and academic achievement, and (ii) autonomous self-regulation (RAI) and academic achievement. It was also interesting to note, that meaningful commitment could predict greater variance in need satisfaction than autonomous self-regulation (RAI).

Model 2 delivered important insight, but it was still difficult to reach any conclusions regarding the role of meaningful commitment in SDT, because model 2 did not contain the same variables that was included in all of the previously assessed model 1 versions. To address this, we modified Models 1.1 and 1.2, by

replacing RAI/autonomous motivation with meaningful commitment (named model 1.3) so that we could make informed decisions about what a third model should look like. Direct effects identified in model 1.2, were also identified in model 1.3, but marked differences were observed in terms of indirect effects. I argued that these results seem to indicate that meaningful commitment may play an important role in a SDT model (by virtue of displaying similar direct effects), but that the manner in which meaningful commitment influences SDT constructs, differ from autonomous motivation (because indirect effects differ, and also because meaningful commitment and autonomous motivation represent independent constructs as demonstrated by PCA). It therefore seemed necessary to create one model containing all constructs.

Model 3 was created, in which (i) meaningful commitment occurred with need support in the beginning of the model, (ii) both need support and meaningful commitment predicted autonomous motivation and perceived competence and (iii) perceived competence as only construct to have a direct path to academic achievement. Most of the expected direct effects were found to be significant, except for the direct effect between meaningful commitment and perceived competence. It was interesting to note that the path coefficients between meaningful commitment and autonomous motivation was considerably larger than the path coefficients between need support and autonomous motivation. Perceived competence as mediator furthermore contributed to a noteworthy 75% of the total effect between meaningful commitment and perceived competence. It was also exciting to note that need support and meaningful commitment accounted for 57% variance in autonomous motivation, whilst these three variables contributed to 34% of variance in perceived competence. In the following chapter, I interpret the findings of the present study within the context of prior investigations, discuss the potential limitations and contributions of the present study and make recommendations for future investigations.

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Chapter 5
Interpretations of Results and Conclusions

5.1 INTRODUCTION

The purpose of the present study was to investigate if meaningful commitment and SDT related constructs influence academic achievement in Grade 11 and 12 South African learners. In addition, I explored the association between meaningful commitment and SDT constructs (i.e., autonomous motivation, perceived competence, and basic psychological needs), and their contribution to the SDT and academic commitment literature. I created and tested two hypothesised models (models 1 and 2) as well as several additional models (models 1.1, 1.2, 1.3 and model 3), to answer my research questions and test hypotheses. In this chapter, I discuss my interpretations of the findings as well as the theoretical, methodological, and practical contributions of the study. I conclude with limitations and recommendations for future research.

5.2 INTERPRETATION OF FINDINGS

5.2.1 PRINCIPAL COMPONENT ANALYSIS

5.2.1.1 Autonomous and controlled motivation versus RAI

The PCA results of the autonomous self-regulation questionnaire, indicated three components (cf. chapter 4, section 4.3.3), instead of the expected five (i.e., meaningful commitment, intrinsic, identified, introjected and external regulation). Items for intrinsic and identified regulation loaded on one component (i.e., autonomous motivation) and external and introjected items on another component (i.e., controlled motivation). Together with correlational results that suggested that the quasi-simplex pattern of the RAI in the present study was unconventional (cf. chapter 4, section 4.2.2.3 (a)), the overall pattern seemed to suggest that the use of a RAI composite score would be inappropriate for further analyses.

Several studies, based on younger populations (mean ages ranging between 10 and 19 years), exist where researchers also reported a similar unconventional quasi-simplex pattern using similar SDT measurements (Assor, Vansteenkiste & Kaplan, 2009, study 1; Boiche, Sarrazin, Grouzet & Pelletier, 2008; Ratelle, Guay, Vallerand & Senecal, 2007; Ryan & Connell, 1989). I proposed that identity development processes in the participating adolescents (see chapter 2, section 2.7.2) could have impacted on the unconventional pattern I obtained. More specifically, I think that adolescents who experience identity exploration or moratorium where they reconsider previously held identifications of significant others (e.g. parent's attitudes towards academic achievement), may have been evaluating and deciding which academic goals or actions they want to personally endorse, versus the academic goals and behaviours as imposed by significant others. For example, identified and introjected regulation

correlated with academic achievement in the present study, whilst intrinsic regulation was not. A similar correlational pattern can also be observed in other studies with high-school learners (e.g. Alivernini & Lucidi, 2011; Burton, Lydon, D'Allesandro & Koestner, 2006; Otis, Grouzet & Pelletier, 2005). Thus, I argue that the adolescents in my study might have found it difficult to differentiate between closely related regulatory styles (i.e., introjected and identified regulation), leading to the unconventional RAI quasi-simplex structure in my study, and possibly also in other studies. These suggestions will however need to be investigated more systematically in future studies using measurements of identity development.

Despite the aforementioned limitations, the PCA results in the present study show that even though it may have been difficult for the participants to differentiate between external and introjected regulation, they were very able to differentiate between autonomous and controlled motivation, as have also been reported by other authors in the educational domain (e.g. Vansteenkiste, et al., 2005; Zhou, et al., 2009).

5.2.1.2 Autonomous motivation and meaningful commitment

A core aspect of my central thesis, is that meaningful commitment and autonomous motivation are unique constructs. The results of my study indicated autonomous motivation, and the intrinsic and identified subscales to be highly correlated with meaningful commitment, raising a concern about collinearity. However, PCA results showed that, despite their strong correlation, meaningful commitment and autonomous motivation were indeed measured as unique constructs that are associated but conceptually *different*.

In chapter two, section 2.8.3.2, I argued that meaningful commitment is conceptually *different* from autonomous motivation because meaningful commitment, unlike intrinsic motivation, concerns the pursuit of an outcome (i.e., future identity goal) that can be separated from the activity itself. I also proposed that meaningful commitment differs from integrated and identified regulation (cf. chapter 2, section 2.8.3.2) because identified and integrated regulation occur when people internalise externally imposed tasks to such an extent that they identify and agree with the underlying value of the behaviour (Deci & Ryan, 2000). In contrast, meaningful commitment refers to the pursuit of goals that people agree and identity with, since it reflects their sense of self, enduring values and future identity goals. One could argue that the enduring values that Sheldon and Elliot (1999) refer to in reference to self-concordant goal selection, is the same future identity goals that I refer to with regards meaningful commitment. However, Sheldon and colleagues predominantly examine self-concordant goal selection, by asking participants to list their personal projects (Little, 1993) or strivings (Emmons, 1989) for autonomous reasons (cf. chapter 2 section, 2.6.5.3). Sheldon et al., (2001), however, presented the MPIC model, in which the authors differentiate between personal goals or aspirations and identity content and recently (Sheldon et al., 2015) suggested that it has not been directly tested that self-concordant goal selection reflects deep personality-goal fit. Indeed, one of the advantages of using a self-concordance methodological approach, they say, is that "…it does not require people to have direct insight into whether their goals fit

their “deep” personality...” (p. 355). Hence, it is not a foregone conclusion that identified regulation is based on identity content.

In my conceptual framework, I argue that personal goals or aspirations occur on an intermediate or goal commitment level, and not a higher-order identity commitment level. I also propose that meaningful commitment forms part of higher-level identity commitment, whilst autonomous motivation forms part of lower-level behavioural commitment (cf. chapter 2, sections 2.9.4 and 2.8.3.2). Learners may therefore have specific personal goals or projects that they feel is important to them right now (e.g. I want to be popular), but it is not to say that these personal goals represent more *long-term* future identity goals (e.g. I want to be a successful person in the future). Said differently, I propose that people autonomously engage in behaviours on a lower-level based on intermediate personal goals, but that it is not to say that these behaviours are necessarily a reflection of higher-order future identity goals. Thus, I argue that not *all* autonomously motivated behaviours reflect higher-level identity goals or represent meaningful commitments.

I do however also propose that meaningful commitment and autonomous motivation *are associated* with each other. More precisely, I argue in my conceptual framework (cf. chapter 2 section 2.9.4.1) that people who experience meaningful commitment experience higher levels of autonomous motivation, which might explain why these constructs share a strong correlation. Indeed, results from model 3 show that meaningful commitment significantly predicted autonomous motivation (kindly refer to section 5.2.4.1 for a comprehensive discussion). In essence, I propose that people will find it easier to agree and identify with an outcome of an externally imposed tasks (i.e. autonomous motivation), when they also feel that the outcome of the externally imposed task resonates with their future identity goals (i.e., meaningful commitment).

5.2.1.3 Controlled motivation and meaningful commitment

PCA results also showed that meaningful commitment and controlled motivation represent different constructs. I have already argued in chapter 2, section 2.8.3.1, that external and introjected regulation differ from meaningful commitment. In short, I propose that meaningful commitment, unlike introjected regulation is not based on internal pressures or contingent self-evaluations, nor external contingencies as is the case with external regulation.

It was, however, surprising to find that meaningful commitment shared a moderate and significant correlation with introjected regulation (r (351) = .50, p < .01), external regulation (r (351) = .47, p < .01), and controlled motivation (r (351) = .51, p < .01). These findings seem to suggest, that meaningful commitment and controlled motivation are associated with each other, which I did not anticipate. I propose that these unanticipated results, could perhaps be the result of (i) the poor internal consistency levels of the introjected (α = .78) and external regulation subscales (α = .57) as well as (ii) the developmental level of participants (as have already been discussed in the precious section). It is

however important to mention that meaningful commitment shared a stronger correlation with intrinsic regulation (r (351) = .73, p < .01) with an internal consistency level of .87 and identified regulation (r (351) = .67, p < .01), with an internal consistency level of .85, and that meaningful commitment predicted autonomous motivation in model 3 (cf. section 5.2.3). Hence, even though there seems to be some support for the proposed association between meaningful commitment and autonomous motivation, it remains unclear whether meaningful commitment also leads to controlled motivation. Future investigations could explore the association between meaningful commitment and controlled motivation, in larger and more representative samples.

5.2.2 MODEL 1 VERSIONS

I created and tested several versions of model 1, including: (i) ***RAI*** (i.e., ***model 1.1***) to investigate the applicability of a SDT informed motivational model in a South African academic context, (ii), ***autonomous motivation*** (i.e., ***model 1.2***), to consider the independent effects of autonomous motivation in model 1, because the RAI of the present study displayed an unconventional simplex structure and (iii) ***meaningful commitment*** (i.e., ***model 1.3***) to investigate the association between meaningful commitment and the SDT variables included in model 1. In the following sections I discuss findings of these models, by referring to each variable included in these models

5.2.2.1 Perceived competence

The higher levels of perceived competence reported by participants in the present study, is consistent with other SDT theoretical investigations in the education domain (Standage, Duda & Ntoumanis, 2005; Vallerand et al., 1997). An investigation including a South African sample of 12-year-olds, using a similar measurement of perceived competence in educational environments, also reported higher perceived competence levels (Harrison, Malaka, Amoateng & Toldson, 2005).

Perceived competence was, moreover, the only variable that persistently predicted academic achievement, in all of the model 1 versions. Several other motivational theorists (cf. chapter 2, section 2.5) and researchers have also argued that learners who feel more competent, display improved academic outcomes (e.g. Anderman & Midgley, 1997; Eccles, Midgley, & Adler, 1984, Ferla, Valcke & Schuyten, 2010) and SDT researchers, specifically, have also demonstrated that perceived competence is particularly important for academic achievement. For instance, Grolnick and Slowiaczek (1994) found a direct path between perceived competence and actual academic achievement levels. Olusola (2013) and Yarahmadi (2011) found that perceived competence predicted more variance in self-reported academic achievement than need support, while Grolnick et al. (1991) found that perceived competence accounted for more variance in academic achievement than autonomous self-regulation.

People experience competence need satisfaction, according to SDT when they feel that they have the opportunity to display their effectiveness (Deci & Ryan, 2000) and academic achievement, arguably,

gave learners the opportunity to display their effectiveness in educational contexts. It is, however, important to mention again, that there are differences between how perceived competence is conceptualised in SDT and social learning theory (cf. chapter 2, 2.6.3.1). More specifically, SDT theorists propose that perceived competence is part of basic psychological need satisfaction, which means that perceived competence in SDT is less dependent on reinforcements by teachers. The results from the present study, therefore, indicate that it was important for learners to feel effective as well as have the opportunity to display their effectiveness in order to achieve academic success.

5.2.2.2 Need support

It was encouraging to note that the South African learners in the present study, like other learners included in samples elsewhere (Black & Deci, 2000; Gillet, Vallerand & Lafrenière, 2012), reported average levels of need support, even though some of the participants were in an under resourced school. There is, to the best of my knowledge, no other South African based study that have considered the extent to which learners experience basic psychological need *support* in academic environments. Other South African based studies have however considered basic psychological need *satisfaction* (Chen, Van Assche et al., 2015, study 1, Roman et al., 2015, Thekiso et al., 2013), and reported average to above average levels of need satisfaction in younger and older samples.

(a) Need support predicting RAI and autonomous motivation

The participants in the present study reported that they experienced autonomous self-regulation or autonomous motivation, when they felt that their teachers supported their basic psychological needs. This was expected because it is proposed in (i) *cognitive evaluation theory* that basic psychological needs energise the development and maintenance of intrinsic motivation (Deci & Ryan, 1985), and (ii) in *organismic integration theory* that need support help people to experience internalisation (Ryan & Deci, 2006). Furthermore, several other researchers have also reported that need support predicts autonomous motivation (e.g. Arnone, Reynolds & Marshall, 2009; Hadre & Reeve, 2003).

(b) Need support predicting meaningful commitment

Perceived basic psychological need support from teachers predicted meaningful commitment in model 1.2 as well as in model 2 (see also section 5.2.3.2). This is a significant finding, because authors have noted that more insight is needed regarding the association between contextual support and academic commitment (Human-Vogel & Dippenaar, 2013; Human-Vogel & Rabe, 2015). I argue in my conceptual framework that need support only influences meaningful commitment, as higher-level construct over a long period of time (cf. chapter 2 section 2.9.4.1). More specifically, I argue that long-term exposure of basic psychological need support from teachers, make learners expect that they will receive need support from other teachers in future, which in turn help them to decide whether they should pursue meaningful commitments or not. To illustrate, I propose that a learner will pursue a future identity goal

of being a successful person when she expects that teachers, will allow her to choose her own academic activities (i.e., autonomy), give her structure and opportunities to display her effectiveness (i.e., competence) and support her emotional needs (i.e., relatedness). Said differently, she wants to pursue her future identity goals, since she expects to be successful in her pursuits, because she anticipates that her basic psychological needs will be supported.

(c) Need support predicting perceived competence, and the significant indirect effect including autonomous motivation/ RAI

It was not surprising to find that need support predicted perceived competence, because need support includes competence support (Deci & Ryan, 2000) and other researchers have also reported similar findings (e.g. Pesch, Larson & Surapaneni, 2016; Vierling, Standage & Treasure, 2007).

Autonomous motivation and RAI was, also a complimentary mediator (Zhao et al., 2010) in the significant direct effect between need support and perceived competence. The significant indirect effect from need support → autonomous motivation → perceived competence contributed to 62% of the total effect between need support and perceived competence (cf. chapter 4, section 4.3.4.2). In other words, it was important for the learners to feel that they could agree and identify with the outcome of externally imposed tasks to experience competence, when receiving basic psychological need support. Prior investigations within the academic domain have also reported similar findings (e.g. Guay et al., 2001; Williams & Deci, 1996).

(d) Need support not predicting academic achievement, and the mediating effect of perceived competence

I originally hypothesised that need support would directly predict academic achievement levels in the present sample, but this hypothesis was rejected. One could argue that items of the academic climate questionnaire, used in the present study, focused on general academic need support (e.g. “I feel that teachers provide me with choices and options”), and not specifically support for academic achievement (e.g. tests or assignments). I therefore propose that need support as operationalised in the present study, may be related to general positive academic outcomes but not necessarily academic achievement. An additional literature review supports this argument, for the majority of prior investigations found that need support predicts positive academic outcomes in general (e.g. Ratelle & Duchesne, 2014, Ryan, Stiller & Lynch, 1994, Wong, West & Cusick, 2002), with only few studies indicating a direct association with academic achievement levels (e.g. Betoret & Artiga, 2011). Nevertheless, I did not measure general positive academic outcomes in the present study, and my argument, therefore, remains tentative.

Need support and academic achievement was however correlated in the present study, which suggested that mediation or indirect effects were present. Perceived competence did indeed mediate the association between need support and academic achievement in models 1.1 and 1.2. Need support, in

other words, only predicted academic achievement through perceived competence in the present study. Other researchers have correspondingly found that perceived competence mediate the association between need support and positive academic outcomes (Amorose & Anderson-Butcher, 2007; Grolnick et al., 1991; Yarahmadi, 2011).

5.2.2.3 Meaningful commitment

(a) Meaningful commitment predicting perceived competence

Meaningful commitment predicted perceived competence in model 1.3. Vogel and Human-Vogel (2016), in a similar vein, found that meaningful commitment and self-efficacy (operationalised by the materials science self-efficacy scale) were correlated in their university student sample, but did not assess whether meaningful commitment predicted self-efficacy. However, as discussed before, there are conceptual differences between perceived competence in SDT and self-efficacy as part of social learning theory (cf. chapter 2, 2.6.3.1, chapter 5, 5.2.2.1). The participants, therefore, who felt that their academic goals were identity related (i.e., meaningful commitment), also reported that they felt competent during academic activities, and that they could display their competence (i.e., perceived competence). In the present study, I argue that meaningful commitment predicted perceived competence because meaningful commitment (i) gives a sense of *coherence and predictability* in life, (ii) leads to *improved resource allocation*, (iii) higher levels of *behavioural investment* and (iv) task-related *skills development.*

I argued in chapter 2 section 2.7.1.2, that people make meaningful commitments in order to experience higher-level *coherence and predictability in life*, which in turn make them feel more competent during tasks. For example, a learner has an identity self-description of being a successful student, because she has experienced success and felt competent when partaking in academic tasks in the past. She also expects that she will continue being successful and competent during academic tasks in future, because she experiences a need for coherence and predictability in life. Furthermore, I argue that purpose inform people's identity self-descriptions and future identity goals (cf. chapter 2, section 2.7.1.2), and propose like McKnight and Kashdan (2009) that that purpose leads to *improved resource allocation*. I therefore argue that the aforementioned learner will display improved resource allocation by, (i) avoiding behavioural choices that will contradict her future identity goals (e.g. not doing homework) and (iii) committing to behavioural goals that reaffirm her future identity goals (e.g. I'd rather stay at home and study before a test than go to a party). These behavioural choices result in higher levels of *behavioural investment* or academic engagement, which literature indicates is associated with competency feelings (Christenson, Reschy & Wylie, 2012). I also concur with Eccles (2009) who argues that people choose to engage with subjectively meaningful tasks on a regular basis, which help them to develop *task-related skills over time* that in turn will help them to expect that they will also be effective in future meaningful tasks.

(b) Meaningful commitment as mediator in the direct effect between need support and perceived competence

Meaningful commitment was a complimentary mediator, and contributed 51.35% to the total effect between need support and perceived competence in in model 1.3, (cf. chapter 4, 4.3.5.2 b). It therefore appears that meaningful commitment had an influence on how competent learners felt, when receiving basic psychological need support. The direct effect form need support to perceived competence was expected, based on other existing SDT findings (cf. section 5.2.2.2 c). Also, in terms of my conceptual framework, it makes sense that need support that forms part of lower-level regulation will have a direct influence on perceived competence, as part of micro-regulation.

As discussed before, I argue in my conceptual framework that long-term exposure of need support influences meaningful commitment. I argue in section 5.2.2.2 (d), that persistent need support from teachers during several activities over a lengthy period make learners expect that their needs will be supported in the future too, which make learners more willing to commit to academic-related future identity goals (i.e., experience meaningful commitment). Furthermore, I have already discussed why I believe meaningful commitment predicted perceived competence in the previous section. Therefore, the significant indirect effect from need support to meaningful commitment to perceived competence arguably, seem to show that learners not only felt competent during tasks when they received need support, but also because, (i) they felt that the task was related to their future identity goals, (ii) which they felt they could pursue because they expected to receive basic psychological need support from others, based on past experiences.

(c) The significant indirect effect from meaningful commitment → perceived competence → academic achievement

I originally hypothesised that meaningful commitment would predict academic achievement. I argued that the participants' future identity goals, (e.g. "I want to be a successful student"), would influence the perceived meaningfulness of academic goals (e.g. "I need to do well in school"), which would in turn, if perceived as meaningful, increase commitment to behavioural goals (e.g. "I need to study hard"), which would ultimately influence academic achievement. Meaningful commitment, however, did not directly predict academic achievement in model 1.3 or model 2.

Meaningful commitment, nevertheless, predicted academic achievement indirectly through perceived competence. I propose that perceived competence, as influenced by meaningful commitment (cf. section 5.3.3.2 a), predicted academic achievement, because it assisted learners to (i) feel that their possible future selves were *plausible* (ii) that their future identity goals were *feasible*, (iii) which made them *invest* more time and effort in their studies (i.e., investment size) and display academic achievement. Oyserman and colleagues, for instance, propose that future possible selves only lead to positive academic outcomes, when learners perceive their possible selves as *plausible* (Oyserman et al., 2004, Oyserman

et al., 2006, Oyserman & Destin, 2010; Oyserman & James, 2011). Learners have plausible possible selves, when they believe that they will be able to attain future possible selves, because they have the necessary strategies in place to be successful (Oyserman et al., 2006). Oettingen et al., (2009), similarly, propose that people display higher levels of future goal commitment when they feel that the *feasibility* is high of attaining the goal. Moreover, it is indicated in student engagement literature that learners invest more effort in academic tasks when they expect that they will be successful (Barkley, 2010), and that higher levels of *behavioural investment* leads to academic achievement (Reyes et al., 2012). Simply put, I argue that the learners in the present study who experienced meaningful commitment and perceived competence, felt that the likelihood of reaching their envisioned future possible self and future identity goals was high, which made them invest more effort in academic activities, and consequently achieve higher academic results.

Only one other study has investigated if meaningful commitment (as operationalised in the present study) predicts academic achievement (Vogel & Human-Vogel, 2016). Vogel and Human-Vogel (2016), found that meaningful commitment only indirectly predicted academic achievement, in their university student sample, through investment size. Findings from the present study, as well as that of Vogel and Human-Vogel (2016), therefore seem suggest that meaningful commitment forms part of a larger self-regulatory model, in which several variables need to be in place, before learners achieve academic success. To elaborate, Vogel and Human-Vogel (2016) operationalised investment size as the time and effort that students invest in their studies. They argue that meaningfulness as part of higher-level regulation influences investment size that forms part of lower-level regulation, which in turn leads to academic achievement. The findings from the present study, in a similar vein, indicates that meaningfulness as higher-level regulation influenced perceived competence (occurring during micro-regulation), which in turn predicted academic achievement. These findings together with Vogel and Human-Vogel's (2016) results, therefore, seem to show that learners do not simply achieve academic success when they feel that academic goals are identity relevant, they also need to (i) invest behavioural effort in academic activities, and (ii) feel competent when completing activities.

5.2.2.4 RAI and autonomous motivation

(a) RAI and autonomous motivation predicting perceived competence

Both autonomous self-regulation and autonomous motivation predicted perceived competence in models 1.1 and 1.2, as originally hypothesised. Prior investigations in the academic (e.g. Black & Deci, 2000; Deci, Hodges, Pierson & Tamassone, 1992; Grolnick et al., 1991; Guay et al., 2001) and the health domains (Ryan & Deci, 2006; Williams, McGregor, Sharp, Levesque, Kouides, 2006) have also reported a significant association between autonomous self-regulation and perceived competence. It would therefore appear that learners in the present sample also experienced higher perceived competence when they felt that they were autonomously motivated.

(b) RAI and autonomous motivation not predicting academic achievement and perceived competence as mediator

It was surprising to find that autonomous self-regulation was not correlated with, nor predicted academic achievement in models 1.1 and 2 (see section 5.3.2), because it is inconsistent with other research findings (e.g. Soenens & Vansteenkiste, 2005). One could argue that the unconventional simplex structure of the RAI in the present study, may have contributed to this unanticipated result (cf. section 5.3.3.1). Indeed, several authors who have reported an unconventional simplex pattern with younger participants in the academic domain, also report insignificant associations between autonomous self-regulation and academic achievement (e.g. Alivernini & Lucidi, 2011; Noels, Clément & Pelletier, 1999). RAI was therefore replaced by autonomous motivation in model 1.2, to account for unconventional simplex structure of the RAI. Autonomous motivation, nonetheless, like RAI did not predict academic achievement. This finding is also inconsistent with some previous SDT investigations. Vansteenkiste, Zhou et al. (2005) (study 1), for instance, reported that autonomous motivation significantly predicted the self-reported academic performance of Chinese participants with a mean age of 23.8 years.

The autonomous motivation construct consisted of both intrinsic and identified regulation items, in the present study. The participants in this study reported higher levels of identified regulation than intrinsic regulation, as have been reported in other SDT investigations in school contexts (Alivernini & Lucidi, 2011; Taylor et al., 2014). Identified regulation, moreover, was correlated with academic achievement, while intrinsic regulation was not. It stands to reason that the Gr. 11 and 12 participants of this study, reported higher levels of identified regulation than intrinsic regulation because they face various life challenges in which academic achievement is instrumentally important (e.g. applying for university entrance), limiting the extent to which they engage with academic activities for interest sake. Furthermore, one could argue that the lower level of intrinsic regulation in relation to identified regulation as reported by participants, may have contributed to the insignificant direct effect from autonomous motivation and academic achievement.

Autonomous motivation and academic achievement were however correlated and, it was therefore not surprising to find that perceived competence was an indirect only mediator (Zhao et al., 2010) in the association between autonomous motivation and perceived competence. Learners in the present sample who reported autonomous motivation for academic activities, therefore, only achieved higher marks when they also experienced competence. Several SDT theorists have also noted that it is important to both feel autonomous and competent during tasks. Deci and Ryan (2000) for instance mention that individuals who experience autonomy during competency-related tasks achieve better results, because they feel responsible for their actions. Other authors have also argued that competence support (e.g. structure) delivers best results when combined with autonomy support (e.g. offering a meaningful rationale) during academic activities (Jang et al., 2010, Reeve, 2006).

5.2.2.5 SDT model comparisons

Several fit indices of each model 1 version were compared, as recommended by Jackson et al. (2005), to assess which model, displayed best fit with data (cf. chapter 4, tables 4.24 and 4.21). These results showed that both model 1.2 (including autonomous motivation) and model 1.3 (including meaningful commitment) displayed an improved fit of data, in comparison to model 1.1 (including RAI).

The path coefficient weights, indirect effect sizes, and multiple squared correlations was consistently larger in model 1.2 than in model 1.1. As mentioned before, the autonomous motivation variable does not have any controlled items, while the RAI variable contains a mixture of controlled and autonomous motivation items. I believe that one could possibly argue that the lack of controlled items in the autonomous motivation variable led to a more concentrated representation of autonomous self-regulation, which resulted in the larger path coefficient weights and squared correlations in model 1.2. Furthermore, the unconventional simplex structure of the RAI, and the poor internal consistency levels of the external and introjected regulation subscales, included in the RAI (cf. chapter 4 section 4.2.2.3), could also have led to differences between models 1.1 and 1.2.

Similar direct effects were identified in models 1.2 and 1.3 (cf. chapter 4, table 4.22), which could potentially mean that meaningful commitment and autonomous motivation, albeit unique constructs as demonstrated by PCA, fulfilled similar self-regulatory functions in model 1. I differentiate between these constructs in my conceptual framework by arguing that meaningful commitment forms part of higher-level regulation while autonomous motivation forms part of lower-level regulation. It was therefore not surprising to find differences in indirect effect size and significance levels in model 1.2 and 1.3 (cf. chapter 4, table 4.23). For example, the significant indirect effect from need support to perceived competence to academic achievement in model 1.2, was insignificant in model 1.3. Said differently, the only way need support led to academic achievement in *model 1.3*, was through a series of indirect effects where need support → meaningful commitment → perceived competence → academic achievement. Need support, however, led to academic achievement in *model 1.2* via (a) a similar series of indirect effects: need support → autonomous motivation → perceived competence → academic achievement, *and* (b) the indirect effect from need support → perceived competence → academic achievement. The significance levels of the indirect effects identified in model 1.3, furthermore, decreased from p <.01 to p < 05.

These differences of indirect effects identified in models 1.2 and 1.3, can be interpreted by using my conceptual framework. To elaborate, I argue that learners engage in academic activities to reach several different but interrelated goals. More specifically, they may for instance study for tests (a) to fulfil the behavioural goal of studying hard (i.e. lower-level regulation), (b) to do well in a subject (i.e. intermediate regulation) and (c) to describe themselves as a successful person in the future (i.e., higher-level regulation). I propose that meaningful commitment forms part of higher regulation, while autonomous motivation and need support occur during lower-level regulation. Meaningful commitment was not included in model 1.2, implying that model 1.2 predominantly dealt with lower-level regulation, while the

inclusion meaningful commitment in model 1.3, gives insight into both higher-level and lower-level regulation. Said differently, model 1.2, offers an explanation of behavioural engagement during tasks to reach short-term or present-time behavioural goals (e.g. I need to study hard or well), while model 1.3 gives an explanation of behavioural engagement to reach long-term future identity goals (e.g. I need to study now so that I can describe myself as a successful person in the future). As such, it makes sense that learners would display academic achievement and experience perceived competence when receiving need support in model 1.2, whether they agree or identify with the outcome of a task or not, because learners are primarily motivated to achieve present-time behavioural goals and not necessarily an additional long-term future identity goal. Likewise, it makes sense that learners who engage with tasks to reach behavioural goals with the purpose of fulfilling future identity goals, (i.e., model 1.3), would specifically need to consider whether behavioural goals relate to identity content, to feel competent and achieve academic success when receiving need support, hence explaining the insignificant indirect effect from need support → perceived competence → academic achievement in model 1.3

The decrease in significance levels of indirect effects identified in model 1.3 in comparison to model 1.2, can also be explained in terms of my conceptual framework. For example, a learner may have the higher-order future identity goal of being a successful student and consequently commits to the intermediate goal of achieving success in a specific subject. However, there might be several other lower-level influences that might have a more direct influence on whether the learner eventually commits to the behavioural goal of studying hard or not (e.g. health issues or resource availability). I argue in my conceptual framework that some of these lower-level influences include need support from teachers and the extent to which learners experience autonomous motivation. It therefore makes sense that the indirect effects identified in model 1.2 would be more significant than in model 1.3, because the lower-level regulatory variables included in this model (i.e., autonomous motivation and need support) have a more direct influence on micro-regulatory variables (i.e., perceived competence and academic achievement), than higher-level regulation (i.e., meaningful commitment), according to my conceptual framework. Said differently, I propose that there might be more confounding variables that have an effect on the association between meaningful commitment, perceived competence, and academic achievement, than the association between autonomous motivation, perceived competence, and academic achievement.

In sum, a comparison between all the model 1 versions point to the importance both meaningful commitment and autonomous motivation/RAI for the experience of perceived competence and academic achievement. However, it appears that there are differences between how meaningful commitment and autonomous motivation/RAI affect perceived competence and academic achievement. I anticipated the aforementioned, because I differentiate between these variables in my conceptual framework, and PCA results indicated that meaningful commitment and autonomous motivation, represent unique constructs. It therefore seemed important to understand whether (i) meaningful commitment could compete with RAI in predicting academic achievement, (ii) whether need satisfaction as a whole - not only perceived competence, influence the association between meaningful commitment and academic achievement

(i.e., model 2), and (iii) to determine the association between all variables included in the model 1 versions in one inclusive model (i.e., model 3).

5.2.3 MODEL 2

I created model 2 that included meaningful commitment, need satisfaction, autonomous self-regulation and academic achievement to establish whether meaningful commitment could compete with autonomous RAI in predicting need satisfaction and academic achievement.

5.2.3.1 Need satisfaction predicting academic achievement

The participants in the present study reported average levels of need satisfaction. Roman, et al. (2015) recently also used an adolescent South African sample in their investigation that reported average levels of need satisfaction. Chen, Van Assche et al, (2015), furthermore used a five point likert-scale and reported average to above average levels of relatedness ($\overline{X}$ = 4.23), competence ($\overline{X}$ = 4.21), and autonomy ($\overline{X}$ = 3.51) satisfaction in their South African student sample. Need satisfaction, in addition, significantly predicted academic achievement, as was originally hypothesised. This finding is consistent with SDT theoretical assumptions as well as other existing investigations in an educational domain reporting similar findings (e.g. Betoret & Atiga, 2011; Jeno & Diseth, 2014; Milyavskaya et al., 2009).

5.2.3.2 The indirect effect from meaningful commitment → need satisfaction → academic achievement

Meaningful commitment in model 2, like in model 1.3 did not directly predict academic achievement, but was indirectly associated with academic achievement through need satisfaction. Oyserman et al. (2004), argue that future possible selves lead to academic achievement, when learners feel that they have the necessary strategies in place to reach future possible selves (e.g. paying attention in class). Learners' possible self strategies, are furthermore scripted by what they believe is possible and important within their learning environments (Oyserman, Gant & Ager, 1995). I argue that basic psychological need satisfaction, helped learners to feel that they could implement possible self strategies in academic contexts, increasing behavioural goal commitment and subsequently academic achievement. Therefore, I propose that some learners in the present sample may have had future-identity goals about being successful in a school context, which made them select meaningful academic goals, but that these learners also needed to feel, that they had *autonomously* selected these academic goals, that they were *competent* in enacting these goals and that they were supported *(i.e., relatedness)* by others to reach these goals before committing to behavioural goals and achieving academic success.

I already discussed why I believe *perceived competence* mediated the direct association between meaningful commitment and academic achievement in model 1.3 (cf. section 5.2.2.3 b). In addition, I propose that the learners who felt their parents or teachers supported their academic-related future

identity goals (i.e., experienced *relatedness*), found it easier to commit to academic related behavioural goals, also leading to academic achievement. Zhu, Tse, Cheung and Oyserman (2014), for instance, reported that the children in their study who received socio-emotional support from their parents, were more confident that they would reach their hoped for future selves. With regards to *autonomy*, I propose that learners who felt that they could make their own decisions in academic environments also invested more behavioural effort in meaningful academic activities. For example, a learner has the future identity goal of being a successful student, selects the academic goal of achieving high marks in a specific subject and commits to the behavioural goal of studying. This same learner, however, has a kinaesthetic learning style (i.e. preference for processing information through senses), and prefers practical instead of written examinations. It stands to reason, that she would invest more behavioural effort in academic activities and achieve academic success, if she felt that she had a say over how she is assessed (i.e., autonomy).

5.2.3.3 The indirect effect from RAI → need satisfaction → academic achievement

Once again RAI (as was the case in model 1.1) did not predict academic achievement levels in model 2. I have already presented my thoughts on the lack of a significant association in section 5.2.2.3 (b). Autonomous self-regulation, however, significantly predicted need satisfaction in the present study, as originally hypothesised. This finding is consistent with SDT theoretical assumptions, which propose that individuals who experience autonomous motivation are more likely to experience a greater sense of autonomy, competence, and relatedness (Soenens et al., 2011). Prior investigations in the exercise or sport domains (Gunnell, Crocker, Mack, Wilson & Zumbo, 2014; Wehman-Josefsson, Lindwall & Ivarsson, 2015) and the education domain (e.g. Filak & Sheldon, 2008) have reported similar findings.

The learners in the present study who experienced autonomous self-regulation (i.e., agreed with or identified with academic tasks), moreover, only achieved academic success when they also felt that they could make their own decisions (i.e., autonomy), display their effectiveness (i.e., competence), and experienced emotional connectedness (i.e., relatedness) during tasks. Reeve (2012) says that basic psychological need satisfaction energises student engagement, and one could therefore argue that basic psychological need satisfaction and autonomous self-regulation, help increased behavioural commitment (e.g. consistently doing homework), which in turn led to higher levels of academic achievement.

5.2.3.4 Meaningful commitment and RAI: with differing predictor values of need satisfaction

It was interesting to note that meaningful commitment could predict greater variance in need satisfaction than autonomous self-regulation in model 2. There are several potential methodological and theoretical explanations for this finding. One could argue from a methodological point of view, that (i) the unconventional structure of the RAI, and (ii) the poor internal consistency levels of the external and introjected subscales in the present study, could have effected the extent to which autonomous self-

regulation predicted need satisfaction in model 2. Theoretically one could argue that meaningful commitment accounted for more variance in need satisfaction than autonomous self-regulation because: (a) meaningful commitment and *integrated regulation* are similar constructs, (b) learners that experienced meaningful commitment, *valued or benefited* more from need satisfaction in academic contexts and (c) that meaningful commitment increased the likelihood of experiencing *autonomous motivation*, which in turn increased need satisfaction. In this section I give counterarguments for explanations a and b, and discuss why I believe that c is the most probable explanation of the present data.

First of all, one could argue that meaningful commitment predicted greater variance in need satisfaction because it resembled *integrated regulation* - the most internalised form of extrinsic motivation (Deci & Ryan, 2002). The RAI of the present study included intrinsic, identified, introjected and external regulation, but not integrated regulation and amotivation. Integrated regulation was not included in the present study, because a literature review showed that most SDT studies do not include a measurement of integrated regulation, and because SDT theorists have noted some difficulties with regards to the measurement of integrated regulation through self-report measures (Weinstein, Przybylski & Ryan, 2013), particularly in adolescent samples (de Bilde, Vansteenkiste & Lens, 2011; Self-Regulation Questionnaires, 2017).

In the present study, however, I argue that meaningful commitment and integrated regulation represent different constructs. To elaborate, it is stated in SDT literature that integrated regulation takes place when two conditions are met. Firstly, people need to *agree and identify* with the outcome of an externally imposed task based on a person's values and goals (as is the case with identified regulation) and, secondly, assimilate these identifications with *all other aspects of the self* (Deci & Ryan, 1985; Deci & Ryan, 2000; Deci & Ryan, 2002; Pelletier et al., 1997; Vansteenkiste et al., 2011). I have already discussed why I believe that meaningful commitment is conceptually different from identified regulation (see chapter 2, section 2.8.3.2, and chapter 5, section 5.2.1.2 for comprehensive discussions). In short, I refer to self-concordance literature (cf. chapter 2, section 2.6.5.3), identity theorists' work on levels of identity (cf. chapter 2, section 2.7.3.2), and Vallerand's HMIEM model (cf. chapter 2, section 2.6.5.4) to argue that the enduring interests, values and goals that people *agree and identify* with to experience identified and integrated regulation, form part of intermediate level goals in my conceptual framework, and not necessarily higher-level future identity goals that inform meaningful commitment.

Moreover, SDT authors occasionally refer to the other *aspects of the self* that people have to assimilate identifications into so that they experience integrated regulation, as "personally endorsed values, goals and needs that are already part of the self" (Deci & Ryan, 2002, p. 18) (see also La Guardia, 2009; Markland, Ryan, Tobin & Rollnick, 2005). This description of the "other aspects of the self" arguably, once again refer to intermediate goals in terms of my conceptual framework, but not higher-order goals that inform meaningful commitment. Thus, I argue that integration, when defined in this way, occurs when learners experience coherence between intermediate level goals or values (e.g. I want to do well

in this subject, I want to be a successful swimmer, I want to be a school prefect), but not necessarily coherence between higher level future identity goals (e.g., I want to be a successful person in the future) and intermediate academic goals (e.g. I want to do well in this subject), as part of meaningful commitment.

Other SDT authors (Deci & Ryan, 2000; Pelletier et al., 1997; Ryan & Deci, 2011; Soenens & Vansteenkiste, 2011), nevertheless, do explicitly refer to identity content when discussing "the other aspects of the self' when defining integrated regulation. Pelletier et al. (1997) for instance say that integration occurs when behaviour is not only significant but also "consistent with other self-schemas the individual possesses, it is consistent with his/her self-identity" (p. 416). This definition of integration does seem conceptually similar to meaningful commitment, for meaningful commitment also involves the consideration of identity content. Meaningful commitment, however, unlike integrated regulation include future identity goals, meaning people do not only consider their present self-descriptions, but also how they would like to describe themselves in future. These future identity goals do not have a definite outcome, and people therefore persistently engage with behavioural representations of their future identity goals, to experience coherence (cf. chapter 2 section, 2.7.4 and 2.8.3). Hence, I argue that meaningful commitment could perhaps have a more long-term or enduring influence on motivation than integrated regulation. However, the exclusion of integrated regulation is a limitation of the present study (see also section 5.4) and the aforementioned arguments are therefore still tentative.

One could, also argue that meaningful commitment predicted greater variance in need satisfaction, because meaningful commitment influenced the extent to which people *valued or benefitted* from autonomy, competence and relatedness satisfaction. To illustrate, a learner receives basic psychological support from his teachers in academic contexts, but his future identity goals are related to successful sports achievement. He still requires competence need satisfaction, like all other human beings, but value the satisfaction thereof more in sports than academic contexts, and as a consequence report lower levels of perceived competence in academic contexts. SDT theorists, however, argue that basic psychological needs are innate and universal and Deci and Ryan (2000) argue that even though there might be individual differences regarding the strength of people's need for autonomy competence and relatedness, that it is not "…the most fruitful place to focus attention" (p. 232).

Vallerand (2000), however argued that it is important to understand if and how individual differences in need strength affects outcomes. Recently, several researchers have reported that achievement and affiliation motives (found in motive dispositional theory) mediated or moderated the association between competence and relatedness need satisfaction and *domain specific well-being* outcomes (Schüler & Brandstätter, 2013; Schüler, Brandstätter & Sheldon, 2013; Schüler, Sheldon & Fröhlich, 2010; Schüler, Wegner & Knechtle, 2014; Sheldon, Prentice et al., 2015) or *job satisfaction* (Hofer & Busch, 2011), but not *general well-being outcomes* (Sheldon & Schüler, 2011). No researcher has, however, to the best of my knowledge, investigated if motive dispositions have an effect on the association between need satisfaction and academic achievement.

Motive dispositional theorists assume that people's early childhood learning make them value certain needs (e.g. affiliation) and need satisfying opportunities more than other needs and opportunities (Schüler et al., 2010). There are, however, conceptual differences between motive dispositions and identity as conceptualised in the present study. More precisely, motive dispositions resemble mid-level personality factors, and not deeper level self-descriptions or identity content, as discussed by McAdams (1996) (cf. chapter 2, section 2.7.3.2). In addition, there are conceptual differences between needs in motive dispositional theory and SDT. SDT theorists propose that basic psychological needs are innate and universal and not socially constructed, and that people are generally not more sensitive towards need satisfaction opportunities, unless they have experienced need frustration and are engaging in need substitution (Deci & Ryan, 2000; Chen, Vansteenkiste et al., 2015). Chen, Vansteenkiste et al. (2015) correspondingly, found that neither need desirability nor valuation (which was not operationalized through a motive dispositional measure) mediated the association between basic psychological need satisfaction and general well-being outcomes, and that only need valuation predicted need satisfaction. Thus, based on the aforementioned conceptual differences, I argue that one cannot say that meaningful commitment predicted more variance in need satisfaction in the present study, because it made learners value or benefit more from basic psychological need satisfaction.

I do, however, argue in the present study, that meaningful commitment predicted more variance in need satisfaction, because meaningful commitment increased autonomous *motivation*. To be precise, I propose that learners found it easier to internalise externally imposed tasks and experience autonomous motivation), when the outcome of the task was related to their future identity goals (see also chapter 2, section 2.8.5.2), which in turn made them experience higher levels of basic psychological need satisfaction (e.g. Filak & Sheldon, 2008). Indeed, meaningful commitment predicted autonomous motivation and not perceived competence in model 3, as discussed in the following sections.

5.2.4 MODEL 3

Model 3 was created to include all the variables that were part of the model 1 versions, to investigate the association between meaningful commitment and SDT-related variables, in one path model. We originally created a model that was a combination of model 1.2 and 1.3 (see appendix 12), in which need support predicted autonomous motivation, meaningful commitment and perceived competence, but this model delivered poor fit-indices. In a revised model (model 3), we proposed that both need support and meaningful commitment would predict autonomous motivation and perceived competence. Model 3 was over-identified and we could therefore make valid inferences (cf. chapter 4, section 4.3.4.1).

5.2.4.1 Meaningful commitment and need support predicting autonomous motivation

It was interesting to find that meaningful commitment, like need support significantly predicted autonomous motivation in model 3. It was particularly interesting to find that meaningful commitment (β = .68) was a stronger predictor of autonomous motivation, than need support (β = .13). I believe this finding shows that it is important to receive both basic psychological need and meaningfulness need

support to experience autonomous motivation. SDT theorists argue that meaningfulness is not a basic psychological need (cf. chapter, 2 section 2.6.7), but propose in organismic integration theory, that people require autonomy, competence, and relatedness support to experience autonomous motivation (cf. chapter, 2 section 2.6.5.2). In the present study, however, I concur with other authors who propose that meaning is an important human need, that allow people to experience *coherence, purpose,* and *significance* in life (cf. chapter 2, section 2.7.1). More specifically, I propose that the pursuit of *meaningful commitments* lead to an experience of meaning in life, because people experience coherence in life and within themselves (cf. chapter 2, section 2.7.4).

I also draw on the work of several authors who argue that there are different levels of meaning and coherence (cf. chapter 2 section 2.7.1.1). I propose that meaningful commitment offers higher-level coherence (i.e., long-term concerns about the self), while autonomous motivation gives lower-level coherence (i.e., short-term daily decisions). It is important to mention again that PCA results from the present study, indicated that meaningful commitment and autonomous motivation represent unique constructs (cf. chapter, 4 section 4.3.3). I argue in my conceptual framework that meaningful commitment occurs when learners feel that their academic behavioural decisions (e.g. “studying for a test”) align with their intermediate personal goals (e.g. “I want to achieve academic success in a specific subject) *as well as* their higher-order future identity goals (e.g. “I want to be a successful learner). I therefore argue that learners who experience meaningful commitment, also experience high level meaning or coherence between identity content and behavioural decisions (cf. chapter 2, section 2.8.3.2, and section 5.2.1.2). I propose that it is not a foregone conclusion that people also experience higher-level meaning and coherence during autonomous motivation (i.e., intrinsic and identified regulation). To illustrate, a learner with a higher-order future identity goal of being a successful learner, could one evening autonomously decide to go to a party instead of studying, because it is fun or she wants to meet new friends. She therefore experiences lower-level coherence between (i) the various behavioural choices associated with going to a party to have fun (i.e., intrinsic motivation) or (ii) between the personal goal of making friends and going to the party (i.e., identified regulation), but not necessarily higher-level coherence between her future identity goal of being a successful student and choosing to study.

Baumeister (1991) argues that people can experience lower-level meaning without higher-level meaning, but that higher-level meaning generally gives a context in which lower-level meaning is made. I argue that meaningful commitment predicted autonomous motivation in model 3, because meaningful commitment (i.e., higher-level coherence or meaning) gave learners a frame of reference or context from which they could experience autonomous motivation (i.e., lower-level coherence or meaning). More specifically, SDT theorists state that intrinsic motivation occurs when people partake in activities because it is interesting in its own right (Deci & Ryan, 2000). I propose that identity self-descriptions affect which activities people find interesting. For example, a learner studies for a test on South Africa’s Apartheid history. He decides to watch movies about Nelson Mandela, because it is interesting, not to achieve higher marks in the test. I propose that this learner chose to research Nelson Mandela, because he describes himself as a non-racist South African citizen on an identity level. However, this learner will not

necessarily find movies interesting or enjoyable that place leaders who caused racial divide in a positive light.

Furthermore, people experience identified regulation when they can agree or identify with the underlying value of an externally imposed task (Deci & Ryan, 2002). I propose that learners who experienced meaningful commitment, and as such pursued long-term future identity goals, would have found it easier to identify or agree with an externally imposed task and thus experience identified regulation. Hence, I argue that learners experience higher levels of identified regulation for externally imposed tasks (e.g. doing an oral examination) when it relates to both their short-term intermediate goals (e.g. passing English), and their long-term future identity goals (e.g. I want to be a successful person). Moreover, I argue that meaningful commitment has an enduring influence on identified regulation, because (i) it is important for people to experience identity coherence, (cf. chapter 2, section 2.7.4) (ii) people who experience a lack of higher-level coherence and meaning experience an existential crisis, whereas people who experience a lack of lower-level meaning may still be able to function (Baumeister, 1991) and (iii) future identity goals, unlike short-term intermediate goals, do not have an immediate outcome, and people therefore continually engage in meaningful behaviour to attain future identity goals (cf. chapter 2, section 2.7.4).

I argue in my conceptual framework that need support, occurs as part of lower-level regulation, when learners receive support from their teachers *during* task completion, to help them experience autonomous motivation (cf. chapter 2 section 2.9.4.4). It makes sense that learners feel that they enjoy and find academic activities interesting (i.e., intrinsic motivation) when receiving need support during task completion. However, learners also specifically needed to feel that they can agree and identify with the outcome of an externally imposed task to experience identified regulation. One could perhaps argue that having choices (i.e., autonomy support), feeling capable (i.e., competence support), and being emotionally supported (i.e., relatedness) during academic activities, in itself, do not directly speak to whether a person feels that he or she can identify or agree with an externally imposed task or not. I proposed in the previous paragraph that meaningful commitment predicted autonomous motivation, because it helped learners to identify with an externally imposed task, because the outcome is related to their future identity goals. Findings from model 3, therefore, seem to show that it is important for learners to feel that others support their basic psychological during activities *and* that the outcome of activity relates to their future self-descriptions in order to experience autonomous motivation. The importance of both need support and meaningful commitment for autonomous motivation is illustrated by the fact that these variables accounted for an impressive 57% variance in autonomous motivation in model 3, while need support alone accounted for 21% variance in autonomous motivation in model 1.2.

5.2.4.2 Autonomous motivation as mediator in the association between meaningful commitment and perceived competence

Autonomous motivation was a complimentary mediator in the insignificant direct effect from meaningful commitment to perceived competence in model 3 (cf. chapter 4, section 4.3.5.3). The significant direct effect from meaningful commitment to perceived competence in model 1.3, therefore, became insignificant in in model 3 when autonomous motivation was also taken into consideration. I give several possible explanations for why meaningful commitment predicted perceived competence in model 1.3 (cf. 5.2.2.3 a). The fact that autonomous motivation was a mediator in the association between meaningful commitment and perceived competence in model 3, seems to suggest that it was also crucial for learners to feel that they could autonomously pursue identity related behavioural goals, to experience competence.

I argue in chapter 2 sections 2.8.1 and 2.8.3, that meaningful commitment requires human agency and that people autonomously select their own future identity goals. Again, I propose in my conceptual framework that meaningful commitment occur as part of higher-level regulation, while autonomous motivation occurs as part of lower-level regulation. This finding therefore seem to show that learners did not automatically experience competence when they felt that their autonomously selected higher-level future identity goals relate to their behavioural goals (i.e., meaningful commitment), they specifically needed to feel that they can autonomously pursue lower-level behavioural goals (i.e., autonomous motivation). For example, a learner with a future identity goal of being a successful student has recently been diagnosed with a social anxiety disorder. Teachers however force her to do a presentation in front of the entire school in order to successfully complete a subject. The fact that she has the future identity goal of being a successful person, therefore, does not change the fact that she might feel incompetent during the presentation. However, one could argue that the learner would feel more competent if her teachers gave her the opportunity to do the presentation in another format (e.g., written task or doing the speech via YouTube), hence allowing her to feel more autonomous.

Furthermore, I give several possible explanations in section 5.2.3.4, for why meaningful commitment accounted for greater variance in need satisfaction than autonomous self-regulation in model 2. I specifically argued that meaningful commitment accounted for greater variance in need satisfaction, not because meaningful commitment made learners value need satisfaction in academic context more, but that meaningful commitment predicted autonomous motivation, which in turn led to higher levels of need satisfaction. Indeed, meaningful commitment would have directly predicted perceived competence in model 3, if meaningful commitment influenced the extent to which learners valued perceived competence. Findings from model 3, however, seems to suggest that learners who experienced meaningful commitment, also experienced autonomous motivation during tasks, which in turn led to perceived competence.

5.2.4.3 Model 3 in its entirety: meaningful commitment, need support, autonomous motivation, perceived competence, and academic achievement

I shall now discuss how model 3, in its entirety, can be interpreted in terms of what I have proposed in my conceptual framework (cf. chapter 2 section 2.9.4). Firstly, learners felt more autonomously motivated during academic tasks when they (i) experienced need support from their teachers and (ii) when they felt that academic behaviours are related to their future identity goals. Therefore, it appears that it was important for learners to experience both higher-level identity commitment and support from others during lower-level task completion in order to experience autonomous motivation.

Secondly, perceived competence emerged as an important predictor of academic achievement in the present study, for was the only variable in all the model 1 versions that persistently predicted academic achievement. The importance of perceived competence for academic is noticeable in model 3 too. Not only did perceived competence directly predict academic achievement, but meaningful commitment, need support and autonomous motivation also indirectly predicted academic achievement through perceived competence. The fact that autonomous motivation and need support directly predicted perceived competence while meaningful commitment did not, make sense in terms of my conceptual framework. More specifically, my conceptual framework is hierarchical in nature, and I therefore propose that lower-level regulation (i.e., need support and autonomous motivation) will have a more direct effect on micro regulation (i.e., perceived competence) than higher-regulation (i.e., meaningful commitment). Differently put, I argue that people do not pursue meaningful commitments to feel competent, but to reach long-term future identity goals. As such learners, might not feel competent during one specific task, (e.g. failure in one science test), and still not abandon their future identity goals.

An important goal of the present study was to explore whether meaningful commitment can predict academic achievement. Meaningful commitment in model 3 and in model 1.3 only indirectly predicted academic achievement through perceived competence. It is evident in model 3 that it was important for learners who experienced meaningful commitment to also feel autonomous during behavioural pursuits and experience need support from their teachers to experience perceived competence. Indeed, it is noticeable that meaningful commitment and need support without autonomous motivation could account for 26% variance in perceived competence in model 1.3, while meaningful commitment, autonomous motivation and need support in model 3 accounted for 34% in perceived competence.

5.3 CONTRIBUTIONS OF THE PRESENT STUDY AND RECOMMENDATIONS FOR FUTURE RESEARCH

5.3.1 THEORETICAL CONTRIBUTIONS AND RECOMMENDATIONS FOR FUTURE RESEARCH

In the present study, I tried to contribute to theory, by problematising aspects of SDT and academic commitment theory, with the purpose of developing additional hypotheses to be investigated in future

studies. In this section, I therefore discuss how the results of the present study contributes to meaningful commitment and SDT literature, and recommend avenues for future research

5.3.1.1 Theoretical contributions to meaningful commitment

There is a limited amount of research that focus on the impact of identity commitment on motivation and self-regulation. Most researchers focus on the influence of goal commitment on student engagement levels (e.g. Klein et al., 1999 Locke et al., 1981), even though there seems to be some evidence that future possible selves or identity goals may also influence behavioural decisions (Oyserman & Destin, 2010; Oyserman, 2007). Human-Vogel and colleagues, propose that meaningful commitment, as part of academic commitment theory, offer an explanation for how higher-order identity content affects self-regulation (Human-Vogel & Dippenaar, 2013; Human-Vogel & Rabe, 2015; Vogel & Human-Vogel, 2016). Academic commitment theory is, nevertheless, still an emerging or novel theoretical approach, meaning that several questions are still unanswered. I believe that the results of the present study improve understanding of meaningful commitment as a construct, and its association with academic achievement. More specifically, findings from this study and Vogel and Human-Vogel's (2016) study, shows that meaningful commitment does not directly predict academic achievement. Several other factors such as *basic psychological need satisfaction and support* with specific reference to *perceived competence* and *autonomous motivation* are also needed to experience academic success.

I included basic *psychological need support and satisfaction* in the present study, because some authors have noted that more information is required on the influence of environmental factors on meaningful commitment (Human-Vogel & Dippenaar, 2013; Human-Vogel & Rabe, 2015). Human-Vogel and Rabe (2015), investigated if family support has an impact on academic commitment, but no other researcher has considered if basic psychological need support and satisfaction affect meaningful commitment. Need support predicted meaningful commitment in model 1.2, and need satisfaction mediated the association between meaningful commitment and academic achievement in model 2, which seems to indicate that it is essential that learners receive need support from teachers during academic activities to reach positive academic outcomes. The results from the present study, additionally, showed that learners who experienced meaningful commitment also specifically needed to feel that their need for *competence* has been satisfied, in order to be academically successful. Vogel and Human-Vogel (2016) also reported that meaningful commitment and self-efficacy were correlated, but did not assess if meaningful commitment predicted self-efficacy.

Vogel and Human-Vogel (2016), once again, also reported that meaningful commitment did not predict academic achievement in their university student sample, but that meaningful commitment predicted academic achievement through investment size (i.e., the time and effort students put in their studies), which I argue in my conceptual framework forms part of lower-level behavioural regulation. Vogel and Human Vogel (2016) did not assess if other factors, in addition to meaningful commitment and self-efficacy, helped students to invest more time and effort in their studies. I argue in this chapter that the

experience of need support and satisfaction (see sections 5.2.2.2 a and 5.2.3.2) as well as perceived competence (see sections 5.2.2.3 a and c), helped learners to feel like they could commit to behavioural goals, which in turn lead to improved academic results. However, I did operationalise investment size in the present study, and the aforementioned arguments are therefore tentative in nature. I therefore recommend that future research include investment size as a variable, to get additional information on the association between meaningful commitment, basic psychological needs, behavioural investment, and academic achievement.

Furthermore, the present study's findings showed that need support predicted meaningful commitment. I argued that learners displayed higher levels of meaningful commitment, because they expected that they would receive need support while completing meaningful academic activities (cf. section 5.2.2.2 b). However, one could also argue that long-term exposure of need support from teachers and parents effected the content of learners' identity self-descriptions, that in turn influenced which future identity goals learners choose to pursue in the first place (e.g. I am an autonomous, competent, and related person, which makes me believe that I can successfully pursue the future identity goal of being a successful learner). Oyserman and Markus (1993), for instance, argue that adolescents develop an understanding of future possibilities through interpersonal interactions, and there are several other investigations that indicates that interpersonal support is important for possible self development (e.g. Burack, Irby, Carline, Ambrozy, Ellsbury, and Stritter, 1997; Oyserman et al., 2007). Future research could therefore investigate the association between long term need support, identity self-descriptions and meaningful commitment.

The results from the present study, furthermore, supports the construct validity of meaningful commitment. To elaborate, I differentiate between meaningful commitment and *autonomous motivation* in my conceptual framework, by arguing that autonomous motivation occurs as part of lower-level behavioural regulation, while meaningful commitment forms part of higher-level regulation (see chapter 2 sections 2.9.4, 2.8.3.2; chapter 5, section 5.2.1.2 for more comprehensive discussions). PCA results from the present study, did indeed show that meaningful commitment is distinctively different from autonomous motivation. I expected that autonomous motivation or RAI would be closely related to meaningful commitment, because I argued that learners who experienced meaningful commitment would find it easier to identify and agree with the outcome of externally imposed tasks (cf. section 5.2.4.1). Meaningful commitment and autonomous self-regulation, however, differed in the amount of variance it could account for in need satisfaction in model 2. These results seem to offer some tentative support that meaningful commitment and autonomous motivation, albeit closely related, influence motivation in diverse ways.

Findings from model 3, moreover, indicated that learners who experienced meaningful commitment also needed to feel autonomous during their behavioural pursuits, before experiencing perceived competence and academic achievement. As discussed before, Human-Vogel and Rabe (2015) found that people who are self-differentiated, can make rational decisions per own personal standards or values, display

meaningful commitment. I therefore proposed that learners who experience meaningful commitment autonomously select their future identity goals (cf. chapter 2, section 2.8.3.2). Findings from model 3, however indicates that meaningful commitment only delivered positive outcomes (i.e., academic achievement) when learners also felt that they could autonomously pursue their behavioural goals. Said differently, people might feel that they have autonomously decided who they want to be in future, but they also need to feel that they have a say over what they do to reach these future ideals, before feeling competent.

It was surprising to find that meaningful commitment and controlled motivation shared a positive correlation. I give some explanations for why this association incurred in section 5.2.1.3. However, I did not include controlled motivation in any of the path models, which also serves as a possible limitation of the present study (see also section 5.4). It may therefore be worthwhile to consider the association between meaningful commitment and controlled motivation in one path model, or more specifically to establish whether meaningful commitment also predicts controlled motivation, in future investigations. Researchers could for instance investigate which other variables determine whether meaningful commitment leads to controlled or autonomous motivation. One could perhaps argue that a person's identity developmental level or even preferred identity style (chapter 2, section 2.7.2), influences the association between meaningful commitment and controlled or autonomous motivation. One could also argue that some people who experience meaningful commitment may experience controlled motivation, due to a lack of autonomy support, which could also explain why meaningful commitment do not always result in academic achievement. For example, learners may feel like they cannot choose how they pursue their future identity goals (e.g. I want to be a successful learner) on a behavioural level (e.g. how and when I write tests) due to a lack of autonomy support by teachers, leading to lower levels of academic achievement.

5.3.1.2 Theoretical contributions to SDT

I mention in chapter 1 and 2 that only a few SDT researchers have considered the role of meaning of motivation (e.g. Davis et al., 2016; Gagné et al., 1997; Losier & Koestner, 1999; Weinstein, Ryan et al., 2012), Furthermore, SDT theorists do not consider meaningfulness as a basic or fundamental psychological need (e.g. Sheldon et al., 2001; Weinstein, Ryan et al., 2012), even though others have proposed that meaningfulness is an important need that influences motivation (e.g. Andersen et al., 2000; Baumeister, 1991; Heine et al., 2006). I believe that the findings of the present study, contribute to SDT literature by offering some clarification on the role of *meaningfulness as a need* as well as its influence on *autonomous motivation.*

I argue in the present study that people pursue meaningful commitments, because they need to feel that their lives and behavioural decisions follow a coherent and predictable pattern (cf. chapter 2, section 2.7.4). Findings from model 3, show that meaningful commitment was a stronger predictor of autonomous motivation than need support. This finding, therefore, contributes to SDT literature by

showing that it was not only important for the learners in the present study to receive need support in order to experience autonomous motivation, they also needed to feel that the academic activities that they were engaged with, corresponded with their future identity goals. Deci and Ryan (2000), noted that intrinsic motivation and integration of external regulations is not only dependent on the immediate availability of nourishment in the form of basic psychological need support but also "…the extent that the individual has sufficient inner resources to find or construct the necessary nourishment" (p. 229). Meaningful commitment could predict twice as much variance in need satisfaction, as autonomous self-regulation in model 2, and I argue that meaningful commitment could perhaps have been an inner resource, that helped learners to experience need satisfaction in the present study.

To elaborate, I propose that people experience coherence when pursuing meaningful commitments, because they feel that the activities that they are engaged with are related to their future identity goals (chapter 2, section 2.7.3.4). Internalisation also takes place when people can identify or agree with the outcome of an externally imposed task (Deci & Ryan, 2002). It therefore makes sense why some SDT authors argue that internalisation give meaning in life by offering a sense of coherence (see chapter 2 section 2.6.7.1). However, I concur with other authors who argue that there are different levels of coherence and identity (cf. chapter 2, sections 2.7.1.1, 2.7.3.2, 2.8.3). I propose that meaningful commitment gives higher-level coherence (i.e., long-term concerns about the self) because it involves high-level identity goals, while autonomous motivation gives lower-level coherence (i.e., short-term daily decisions), because it includes midlevel personal goals. Higher-level meaning or coherence usually give a frame of reference for lower-level meaning (Baumeister, 1991), and I argue in section 5.2.4.1, that meaningful commitment predicted autonomous motivation by helping learners to agree or identify with an externally imposed task, because the outcome of the task does not only relate to short-term personal goals but also more enduring long-term future identity goals. In other words, I propose that autonomy, competence, and relatedness need support helped learners to autonomously engage with specific behavioural goals, while meaningfulness helped them to identify and agree with the behavioural goal, because it is related to their future identity goals.

Results from model 2 also indicated that autonomous self-regulation predicted basic psychological need satisfaction, as have been reported before in previous studies (e.g. Betoret & Atiga, 2011; Jeno & Diseth, 2014; Milyavskaya, et al., 2009). I tentatively argue in this chapter, that meaningful commitment might have led to higher levels of need satisfaction (as shown in model 2), because learners who experienced meaningful commitment also experienced higher levels of autonomous motivation. Said differently, learners might have found it easier to agree and identity with the outcome of an externally imposed task (i.e., identified regulation), when they felt that the outcome was related to their future identity goals (i.e., meaningful commitment), which resulted in higher levels of basic psychological need satisfaction.

Indirect support for this argument can be found in model 3, where a significant indirect effect was identified from meaningful commitment → autonomous motivation → perceived competence. However, I did not include a path model in the present study, that explicitly assessed the association between meaningful commitment, autonomous motivation and need satisfaction, and it may therefore be worthwhile for researchers in future to explore this association further.

I provide several other potential explanations for why meaningful commitment could account for more variance in need satisfaction than autonomous self-regulation in model 2 (cf. section 5.2.3.4). In short, I argue that meaningful commitment did not predict need satisfaction because (i) learners who experienced meaningful commitment valued basic psychological needs more, based on motive dispositional theory or (ii) that meaningful commitment resembled integrated regulation. It may, however, be necessary to investigate both alternative explanations in future research. Researchers may for instance want to do a PCA of meaningful commitment and integrated regulation, to understand if meaningful commitment and integrated regulation are in fact unique constructs, and if each construct can predict unique variance in other variables. Future researchers could also perhaps create additional path models, to investigate the association between meaningful commitment, motive dispositions and need satisfaction, to see if a significant indirect effect exists from meaningful commitment → motive dispositions → need satisfaction.

Regardless of the reasons why, meaningful commitment, *did* predict both need satisfaction and autonomous motivation in the present study, even though SDT theorists do not consider meaningfulness as a basic or fundamental need (cf. chapter 2 section 2.6.7). The present study's findings, therefore, contribute to SDT literature, by showing it might be important to consider how meaningfulness as a need influences motivation in addition to autonomy, competence, and relatedness.

SDT researchers in future could potentially investigate whether meaningfulness (as defined in the present study) represents a basic psychological need. I argued previously that meaningfulness could perhaps also be a basic psychological need because: (i) it is important for people to experience meaningfulness throughout their lives, (ii) meaningfulness is not only dependent on conscious processing and (iii) meaningfulness is universally important for optimal psychological wellbeing (cf. chapter 1 section, 1.3 and chapter 2 section 2.8.4). These claims however need to be investigated further in studies with large samples including individuals from different countries and cultures.

5.3.2 METHODOLOGICAL CONTRIBUTIONS AND RECOMMENDATIONS FOR FUTURE RESEARCH

There are several South African based studies that have used self-determination theory measurements, and reported high levels of internal consistency (e.g. Chen, Van Assche et al., 2015 (study 2); Davids & Roman, 2013; Muller & Louw, 2004; Pietersen et al., 2009, Roman, 2011; Roman, et al., 2015; Thekiso et al., 2013, Van Ree, 2011). The present study is, however, the first to the best of my knowledge, to use the learning climate questionnaire (Williams & Deci, 1996), the self-regulation questionnaire (Ryan & Connell, 1989) and the perceived competence scale (Williams & Deci, 1996) in a South African sample. These measures presented with satisfactory to high levels of internal consistency with acceptable inter-item correlations in the present study, thus offering tentative support for the validity of using these specific SDT measurements in similar South African samples.

Findings from the present study, furthermore, contribute to recent debate in SDT literature regarding the use of a RAI score as a representation of autonomous self-regulation (cf. chapter 3 section 3.7.4.4). More specifically, the RAI in the present study displayed an unconventional simplex pattern and PCA results showed that it would be more appropriate to consider the independent effects of autonomous and controlled motivation separately, as have been done previously (e.g. Vansteenkiste, Zhou et al., 2005; Zhou et al., 2009). The utilisation of autonomous motivation instead of RAI, furthermore, led to interesting changes in subsequent path analyses. For instance, the replacement of RAI with autonomous motivation, (i) did not result in changes in significance levels of direct effects, (ii) but the model including autonomous motivation produced higher squared correlations, (which I argued was due to the fact that the autonomous motivation construct did not contain any controlled items), and (iii) the model using autonomous motivation instead of RAI (i.e., model 1.2) displayed improved fit of data. Therefore, it would appear that is a need for future studies that explore if the consideration of a RAI score or the independent effects of autonomous motivation lead to different outcomes.

Furthermore, I proposed that the ages of participants included in the present study could have influenced RAI results, since several other investigations using a younger sample also reported an unconventional simplex structure (e.g. Alivernini & Lucidi, 2011; Noels et al., 1999). More precisely, I argue in section 5.2.1.1, that high school learners are engaged in identity development, and as such may find it difficult to differentiate between closely related self-regulatory styles (i.e., identified and introjected regulation). However, I did not include a measurement of identity development in the present study, and suggest that future studies investigate to what extent identity or other developmental factors influence RAI results in younger samples, to determine if RAI scores are an accurate representation of autonomous self-regulation in younger samples.

It was also interesting to note that PCA results indicated that the South African participants of the present study, reported that V 51 of the autonomous-self-regulation scale: “I think that participating in academic activities is part of what learners are supposed to do” relates to autonomous motivation, even though it is a controlled motivation item (cf. chapter 4, section 4.3.3.3). I cannot explain why participants reported

this, based on the present study's findings. It might therefore be worthwhile to conduct future investigations to determine if other South African participants also feel the same, and to what extent cultural or context specific factors affect these results.

Furthermore, the limited amount of prior investigations that included the meaningfulness subscale of the academic commitment scale, were based on tertiary students (e.g. Human-Vogel & Dippenaar, 2013; Human-Vogel & Rabe, 2015; Vogel & Human-Vogel, 2015). The meaningfulness subscale displayed high levels of internal consistency in the present study utilising Gr. 11 and 12 learners. The results of the present study, therefore, contributes to existing instrument validation efforts by indicating the appropriateness of using the meaningfulness subscale in younger populations.

5.3.3 PRACTICAL CONTRIBUTIONS AND RECOMMENDATIONS

The results from the present study, seems to indicate that South African learners may benefit, directly or indirectly, from all of the variables included in the study (i.e., *basic psychological need support and satisfaction, perceived competence, autonomous motivation and meaningful commitment*). Learners in the present study, who felt that their *basic psychological needs* were satisfied, achieved higher academic results in model 2, while basic psychological need support indirectly predicted academic achievement through perceived competence, autonomous motivation, and meaningful commitment in the model 1 versions. It therefore seems important that South African teachers support their learner's basic psychological needs by implementing evidence-based SDT informed strategies as discussed chapter 2 section 2.6.2. Therefore, I recommended that student teachers receive training on how to be need supportive in classrooms.

Perceived competence was the only variable, in all of the model 1 versions and in model 3, that directly predicted academic achievement in the present study. It is therefore important that teachers understand the importance of facilitating learning in a competence supportive manner. SDT authors argue that teachers support competence needs, when they give learners structure (Grolnick & Ryan, 1989), optimal challenges and effectance feedback (Niemiec & Ryan, 2009). One could also argue that it is important for teachers to help all learners acquire the necessary academic skills to experience success. Teachers may for instance specifically consider the importance of scaffolding (Wood, Bruner & Ross, 1976), and allowing the learner to master new tasks in their zone of proximal development (Vygotsky, 1978), so that they may feel more competent. With regards to curriculum development or revision, it may be recommended that policy makers ensure that learning outcomes and assessment standards help learners to feel more competent.

Learners in the present study, moreover, felt more competent when they experienced autonomous motivation when partaking in academic activities. Learners experience autonomous motivation when they can identity or agree with an outcome of an academic task, or when they choose to do an academic activity because it is interesting (Deci & Ryan, 2002). The learners in the present study, however,

reported higher levels of identified regulation than intrinsic regulation, meaning that most of the learners did not perceive academic activities as interesting, but as instrumentally valuable. Teachers can help learners to experience identified regulation by, (i) offering autonomy support and giving them the opportunity to make their own choices in terms of how or when they complete academic tasks or assessments, (ii) by avoiding controlling rewards or external contingencies and (iii) encouraging learners to take responsibility for their own learning (Deci & Ryan, 2000, Kusurkar, Croiset & Cate, 2011; Niemiec & Ryan, 2009). It is especially important that teachers get to know learners, so that they understand which personal or short-term goals motivate them (e.g. I want to achieve academic success to get an academic reward, to please my parents, to get a sports bursary), so that teachers can make uninteresting activities more valuable or meaningful for learners.

Findings from the present study also showed that learners experienced higher levels of perceived competence and autonomous motivation, when they experienced *meaningful commitment*. It is therefore important that teachers understand both which short-term and long-term identity-related goals motivate learners. Educational policy and educational curricula should, furthermore, seek learning content and experiences that allow learners to explore their possible future identities and goals, and how their present involvement in academic activities will allow them to reach their future identity goals. Teachers, schools, and educational policy makers for example could make career guidance or assessments more accessible for Gr. 11 and 12 learners, because thinking about and assessing future career prospects may help them to explore and commit to future identity goals. Teachers, however, also need to be aware that learners, according to this study's findings, will only achieve academic success when pursuing future identity goals, when they feel that their basic psychological needs are supported during academic activities.

Educational Psychologists could also assist Gr 11 and 12 learners in private practice and in schools to formulate and enhance possible future self evaluations, by implementing evidence-based therapeutic investigations including narrative therapy, art therapy and positive psychological interventions (Layous, Nelson & Lyubomirsky, 2012; Owens & Patterson, 2013; Walsh & Hardin, 1994). An important therapeutic goal, would be to help learners create positive yet balanced identity content (Oyserman, 2015). Oyserman (2015) furthermore argue that it is important to help clients feel that they are connected to their future selves or differently said that their future identity goals are attainable. Psychologists should, therefore, when working with learners, not only help them explore how they would like to describe themselves in future, but also help the learner to identify realistic strategies to reach their future identity goals, as well as consult other individuals in the learner's life (e.g. parents or teachers) to support their basic psychological needs.

Psychologists often see Gr. 11 and Gr. 12 learners for career guidance or assessments. The findings from the present study seem to suggest that learners will benefit from postmodern or narrative assessments in addition to standardised assessments, during career assessments. Cohran (2007) states that narrative career counselling is an adaptive process in which personal meaning is explored

and life narratives are scripted, along with specific actions that may be taken to reach future outcomes. Postmodern or narrative approaches include activities such as memory boxes (Ebersohn, 2007), collages, lifelines, journal writing etc. (Fritz & Beekman, 2007). Engaging in these activities will allow learners to explore possible future identities, reflect on their ability to act on future-identity goals and direct present goal behaviour.

5.4 LIMITATIONS OF THE PRESENT STUDY

The following limitations of the present study need to be acknowledged. The sample in the present study, although large enough to allow for valid statistical inferences, was arguably not diverse enough and was not representative of the general learner population in South Africa. The majority of the participants were white and originated from resourced schools. The present investigation was however exploratory in nature, and future investigations will need to include more representative samples in order to obtain an accurate representation of South African learners.

I discussed various learner, contextual and systemic influences on South African learner performance in chapter 2 (section 2.2.3). The present study only included variables related to self-regulation and motivation in relation to academic achievement. Path analysis results indicated that all of the predictor variables included in the present study, could only predict a modest amount of variance in academic achievement as outcome variable. Differently said, there were other confounding or excluded variables that also influenced academic achievement in addition to those that were investigated in the present study. Future investigations could, therefore, also consider if and how other systemic factors affects academic achievement, in addition to the variables included in the present study.

Methodologically, an important limitation of path analysis is that it precluded me from making inferences regarding causality and that I was only able to investigate prediction and correlation between variables (Norman & Streiner, 2003). My decision to use path analysis instead of structural equation modelling, for example, prohibited me from considering the influence of latent variables as well as the measurement error of the scales utilised (Kline, 2010). I also used a cross-sectional design as well as purposive sampling, and the findings of the present study are therefore only applicable to the present sample. Using a survey as data collection method also limited any potential additional input from participants, as would have been the case in a qualitative design (Cohen et al., 2007).

I have already discussed several other theoretical limitations in this chapter, that could have influenced the results of the present study. More specifically, I mention that I did not include a measurement of integrated regulation, which prohibited me from investigating whether meaningful commitment and *integrated regulation* represent unique constructs. Differently put, it is difficult to definitively say at this stage whether meaningful commitment or integrated regulation influenced results. I explain why I believe meaningful commitment differs from integrated regulation in section 5.2.3.4, but these explanations remain tentative in nature. Furthermore, I did not include controlled motivation in secondary path

analyses (I explain why in chapter 4, section 4.3.4.1), which made it difficult to reach any conclusions regarding the association between meaningful commitment and controlled motivation. In a similar vein, I also did not consider whether meaningful commitment includes intrinsic or extrinsic goals. It is important to understand if meaningful commitment includes extrinsic goals, because extrinsic goals are associated with poor psychological well-being outcomes.

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List of References

Adams, G.R., & Marshall, S.K. (1996). A developmental social psychology of identity: understanding the person-in-context. *Journal of Adolescence, 19*, 429-442.

Adams, S.J. (1963). Towards an understanding of inequity. *Journal of Abnormal and Social Psychology, 67,* 422-436.

Adnam, C.M. (2010). Perspectives of intellectual disability in South Africa: epidemiology, policy, services for children and adults. *Current Opinion Psychiatry*, *23*, 436–440.

Ainley, M., & Ainley, J. (2011). Student engagement with science in early adolescence: The contribution of enjoyment to students' continuing in learning about science. *Contemporary Educational Psychology, 36*(1), 4–12.

Alderfer, C.P. (1969). An empirical test of a new theory of human needs. *Organizational Behaviour and Human Performance, 4* (2), 142-175.

Alivernini, F., & Lucidi, F. (2011). Relationship between social context, self-efficacy, motivation, academic achievement, and intention to drop out of high school: a longitudinal study. *Journal of Educational Research, 104*, 241–252.

Alva, S.A. (1991). Academic invulnerability among Mexican-American students. The importance of protective resources and appraisals. *Journal of Trauma and Loss, 12*, 127-143.

Amorose, A.J., & Anderson-Butcher, D. (2007). Autonomy-supportive coaching and self-determined motivation in high school and college athletes: a test of self-determination theory. *Psychology of Sport and Exercise, 8,* 654–670.

Amrai, K., Motlagh, S.E., Zalani, A., & Parhon, H. (2011). The relationship between academic motivation and academic achievement students. *Procedia-Social and Behavioural Sciences, 15*, 399-402.

Anderman, E., & Patrick, H. (2012). Achievement goal theory, conceptualization of ability/intelligence, and classroom climate. In S. Christenson, A. Reschly., & C Wylie (Eds.). *Handbook of Research on Student Engagement*, (pp 173-191). New York: Springer.

Anderman, E.M., & Midgley, C. (1997). Changes in achievement goal orientations, perceived academic competence, and grades across the transition to middle-level schools. *Contemporary Educational Psychology*, 22, 269-298.

Anderman, E.M., Anderman, L.H. & Griesinger, T. (1999). The relation of present and possible academic selves during early adolescence to grade point average and achievement goals. *Elementary School Journal*, *100*(1), 3–17.

Andersen, S.M., Chen, S., & Carter, C. (2000). Fundamental human needs: making social cognition relevant. *Psychological Inquiry, 11*(4), 269-318.

Anderson, K.G., Case, A. & Lam, D. (2001). Causes and consequences of schooling outcomes in South Africa: evidence from survey data. *Social dynamics: Journal of African Studies*, *27*(1), 37–59.

Antonovsky, A. (1987). *Unraveling The Mystery of Health – How People Manage Stress and Stay Well*. San Francisco, CA: Jossey-Bass.

Appleton, J.J., Christenson, S.L., & Furlong, M.J. (2008). Student engagement with school: critical conceptual and methodological issues with the construct. *Psychology in Schools*, *45*(4), 369–368.

Arnone, M.P., Reynolds, R. & Marshall, T. (2009). The effect of early adolescents' psychological need satisfaction upon their perceived competence in information skills and intrinsic motivation for research. *School Libraries Worldwide, 15*(20), 115–134.

Assor, A, Vansteenkiste, M. & Kaplan, A. (2009). Identified versus introjected approach and introjected avoidance motivations in school and in sport: the limited benefit of self-worth strivings. *Journal of Educational Psychology, 101*(2), 482–497.

Assor, A., Roth, G., & Deci, E.L. (2004). The emotional costs of parents' conditional regard: a self-determination theory analysis. *Journal of Personality, 72*(1), 47-88.

Baerger, D.R., & McAdams, D.P. (1999). Life story coherence and its relation to psychological well-being. *Narrative Inquiry, 9*(1), 69-96.

Bailey, T.H., & Phillips, L.J. (2015). The influence of motivation and adaptation on students' subjective well-being, meaning in life and academic performance. *Higher Education Research and Development, 35(*2), 201-216.

Bandura, A. & Locke, E.A. (2003). Negative self-efficacy and goal effects revisited. *Journal of Applied Psychology, 88*(1), 87–99.

Bandura, A. (1989). Human agency in social cognitive theory. *American Psychologist*, *44*, 1175–1184.

Bandura, A. (2006). Toward a psychology of human agency. *Perspectives on Psychological Science, 1(*2), 164-180.

Barbarin, O. & Richter, L. (2001). *Mandela's Children: Growing Up in Post-Apartheid South Africa*. London: Routledge.

Barbarin, O.A., Richter, L., & de Wet, T. (2001). Exposure to violence, coping resources and psychological adjustment of South African children. *The American Journal of Orthopsychiatry, 71*(1), 16-25.

Barkley, E. F. (2010). *Student Engagement Techniques: A Handbook for College Faculty*. San Francisco: Jossey-Bass.

Baron, R.M. & Kenny, D.A. (1986). The moderator-mediator distinction in social psychological research: conceptual, strategic and statistical considerations. *Journal of Personality Social Psychology, 51*(6), 1173–1182.

Barro, R.J. (1991). Economic growth in a cross section of countries. *The Quarterly Journal of Economic, 106*(2), 407-443.

Bartholomew, K.J., Ntoumanis, N., Ryan, R.M., Bosch, J.A. & Thøgersen-Ntoumani, C. (2011). Self-determination theory and diminished functioning: the role of interpersonal control and psychological need thwarting. *Personality and Social Psychology Bulletin, 25*(3), 1–15..

Battle, A., & Wigfield, A. (2003). College woman's value orientations toward family, career, and graduate school. *Journal of Vocational Behaviour, 62*(1), 56-75.

Bauer, J.J., & McAdams, D.P. (2000). Competence, relatedness, and autonomy in life stories. *Psychological Inquiry, 11*, 276-279.

Baumann, N., & Kuhl, J. (2002). Intuition, affect, and personality: unconscious coherence judgements and self-regulation of negative affect. *Journal of Personality and Social Psychology, 83*(5), 1213-1223.

Baumeister, R.F. (1991). *Meanings of Life*. New York: Guilford Press.

Baumeister, R.F., & Schmeichel, B.J., & Vohs, K.D. (2007). Self-regulation and the executive function: the self as controlling agent. In A.W. Kruglanski., & E.T. Higgins (Eds.), *Social Psychology: Handbook of Basic Principles 2nd ed,* (pp 516-539). New York: Guilford Press.

Baumeister, R.F., Galliot, M., DeWall, N. & Oaten, M. (2006). Self-regulation and personality: how interventions increase regulatory success, and how depletion moderates the effects of traits on behaviour. *Journal of Personality, 74*(6), 1773–1803.

Becker, H.S. (1960). Notes on the concept of commitment. *American Journal of Sociology, 66*(1), 32–40.

Berzonsky, M.D. (1989). Identity style: Conceptualisation and measurement. *Journal of Adolescent Research*, *4*, 268–282.

Berzonsky, M.D. (1996). Identity orientations and decision strategies. *Personality and Individual Differences, 20*(5), 597-606.

Berzonsky, M.D. (2011). A social-cognitive perspective on identit construction. In S.J. Schwartz, K. Luyckx & V.L. Vignoles (Eds). *Handbook of Identity Theory and Research* (pp. 55-77). New York: Springer.

Berzonsky, M.D., Soenens, B., Luyckx, K., Smits, I., Papini, D.R., & Goossens, L. (2013). Development and validation of the revised identity style inventory (ISI-5): factor structure, reliability, and validity. *Psychological Assessment, 25*(3), 893-904.

Betoret, F.D. & Ariga, A.G. (2011). The relationship among student basic need satisfaction, approaches to learning, reporting of avoidance strategies and achievement. *Electronic Journal of Research in Educational Psychology, 9(2),* 463–496.

Bhaskar, R. (1978). On the possibility of social scientific knowledge and limits of naturalism. *Journal for the Theory of Social Behaviour, 8*, 1–28.

Bi, C., & Oyserman, D. (2015). Left behind or moving forward? Effects of possible selves and strategies to attain them among rural Chinese children. *Journal of Adolescence, 44*, 245-258.

Bisman, J. (2010). Post positivism and accounting research: a (personal) primer on critical realism. *Australasian Accounting Business and Finance. 4*(4), 3–25.

Black, A.E. & Deci, E.L. (2000). The effects of instructors' autonomy support and students' autonomous motivation on learning organic chemistry: a self-determination theory perspective. *Science Education, 84*(6), 740–756.

Blackwell, L.S., Tzesniewski, K.H., & Dweck, C.S. (2007). Implicit theories of intelligence predict achievement across an adolescent transition: a longitudinal study and an intervention. *Child Development, 78*(1), 246-263.

Blakemore, S.J., & Choudhury, S. (2006). Development of the adolescent brain: implications for executive function and social cognition. *Journal of Child Psychology and Psychiatry, 47*(3-4), 296-312.

Blau, G.J. (1985). The measurement and prediction of career commitment. *Journal of Occupational and Organizational Psychology, 58*(4), 277-288.

Boiche, J.C.S., Sarrazin, P.G., Grouzet, F.M.E., Pelletier, L.G. & Chanal, J. P. (2008). Students' motivational profiles and achievement outcomes in physical education: a self-determination perspective. *Journal of Educational Psychology*, *100*, 688–701.

Bonneville-Roussy, A., Vallerand, R.J. & Bouffard, T. (2013). The roles of autonomy support and harmonious and obsessive passions in education persistence. *Learning and Individual Differences*, *24*, 22–31.

Bowen, M. (1978). *Family Therapy in Clinical Practice*. New York: Aronson.

Bowers, K.S., Regeher, G., Balthazard, C., & Parker, K. (1990). Intuition in the context of discovery. *Cognitive Psychology, 22*, 72-110.

Branson, N., Hofmeyr, C. & Lam, D. (2013). *Progress through school and the determinants of school dropout in South Africa*: A Southern Africa Labour and Development Research Unit Working Paper. Cape Town: Saldru: University of Cape Town.

Brewster, A. & Bowen, G. L. (2004). Teacher support and the school engagement of Latino middle and high school students at risk for school failure. *Child & Adolescent Social Work Journal*, *21*(1), 47−67.

Bronk, K.C. (2011). The role of purpose in life in healthy identity formation: a grounded model. New *Directions for Student Leadership, 132,* 31-44.

Brophy, J. (2008). Developing students' appreciation for what is taught in school. *Educational Psychologist, 43*(3), 132-141.

Bruner, J.S. (1991). The narrative construction of reality. *Critical Inquiry*, *18*(1), 1–21.

Brunet, J., Burke, S.M., & Sabiston, C.M. (2013). The benefits of being self-determined in promoting physical activity and affective well-being among women recently treated for breast cancer. *Psycho-Oncology, 22*(10), 2245-2252.

Burack, J.H., Irby, D.M., Carline, J.D., Ambrozy, D.M., Ellsbury, K.E., Stritter, F.T. (1997). A study of medical students' specialty-choice pathways: trying on possible selves. *Academic Medicine, 72*(6), 534-541.

Burrow, A.L., & Hill, P.L. (2011). Purpose as a form of identity capital for positive youth adjustment. *Developmental Psychology, 47*(4), 1196-206.

Burton, K.D., Lydon, J.E. D'Allesandro, D.U., & Koestner, R. (2006). The differential effects of intrinsic and identified motivation on well-being and performance: Prospective, experimental, and implicit approaches to self-determination theory. *Journal of Personality and Social Psychology, 91*(4), 750–762.

Burton, P. & Leoschut, L. (2012). *School Violence in South Africa: Results of the 2012 National School Violence Study*. Cape Town: Centre for Justice and Crime Prevention.

Bush, T., Joubert, R., Kiggundu, E. & Van Rooyen, J. (2009). Managing teaching and learning in South Africa. *International Journal of Education Development, 12*, 12–36.

Byrnes, R.M. (1996). *South Africa: A Country Study.* Washington: Cambridge University Press.

Capella, E. & Weinstein, R.S. (2001). Turning around reading achievement: Prediction of high school students' academic resilience. *Journal of Educational Psychology*, *93*(4), 758–771.

Carlberg, C. (2013). *Predictive Analytics: Microsoft Excel.* New York: Pearson Education.

Carver, C. S. & Scheier, M. F. (1998). *On the self-regulation of behavior.* New York: Guildford Press.

Carver, C.S. & Scheier, M.F. (2011). Self-regulation of action and affect. In K.D. Vohs & R.F. Baumeister (Eds.). *Handbook of Self-Regulation: Research Theory and Application.* 2nd ed (pp 3–21). New York: Guildford Press.

Carver, C.S., & Scheier, M.F. (1982). Control theory: a useful conceptual framework for personality-social, clinical, and health psychology. *Psychological Bulletin, 92*(1), 111-135.

Carver, C.S., & Scheier, M.F. (2000). Autonomy and self-regulation. Psychological Inquiry, 11(4), 284-290.

Carver, C.S., & Scheier, M.F. (2003). Self-regulatory perspectives on personality. In T. Millon., M.L. Lerner, & I.B. Weiner (Eds.), *Handbook of Psychology*, (pp 185-209). New Jersey: John Wiley & Sons Inc.

Case, A. & Ardington, C. (2006). The impact of parental death on school outcomes: longitudinal evidence from South Africa. *Demography, 43*(3), 401–420.

Charles, R. (2001). Is there any empirical support for Bowen's concepts of differentiation of self, triangulation, and fusion? *American Journal of Family Therapy, 29*(4), 279-292.

Chemolli, E., & Gagné, M. (2014). Evidence against the continuum structure underlying motivation measures derived from self-determination theory. *Psychological Assessment, 26*(2), 575-585.

Chen, B., Van Assche, J., Vansteenkiste, M., Soenens, B. & Beyers W. (2014). Does psychological need satisfaction matter when environmental or financial safety is at risk? *Journal of Happiness Studies, 16*(3), 15–28.

Chen, B., Vansteenkiste, M., Beyers, W., Boone, L., Deci, E. L., Van der Kaap-Deeder, J., Duriez, B., Lens, W., Matos, L., Mouratidis, A., Ryan, R.M., Sheldon, K.M., Soenens, B., Van Petengem, S., & Verstuyf, J. (2015). Basic psychological need satisfaction, need frustration, and need strength across four cultures. *Motivation And Emotion, 39*(2), 216-236.

Chen, K. & Jang, S. (2010). Motivation and online learning: testing a model of self-determination theory. *Computers and Human Behaviour, 26*, 741–752.

Chinyoka, K. (2014). Impact of poor nutrition on the academic performance of grade seven learners: a case of Zimbabwe. *International Journal of Learning and Development, 4*(3), 73-92

Chirkov, V., Vansteenkiste, M., Tao, R., & Lynch, M. (2007). The role of self-determined motivation and goals for study abroad in the adaptation of international students. *International Journal of Intercultural Relations, 31*, 199-222.

Chouinard, R. & Roy, N. (2010). Changes in high-school students' competence beliefs, utility value and achievement goals in mathematics. *British Journal of Educational Psychology, 78*(1), 31–50.

Christenson, S., Reschly., A., & Wylie, C. (2012). *Handbook of Research on Student Engagement*. New York: Springer.

Christie, P. & Collins, C. (1982). Bantu education: apartheid ideology or labour reproduction. *Comparative Education*, *18*(1), 59–75.

Clark, N.L. & Worger, W.H. (2013). South Africa: *The Rise and Fall of Apartheid.* 2nd ed*.* New York, NY: Routledge.

Cluver, L., Operario, D., Lane, T. & Kganakga, M. (2012). "I can't go to school and leave her in so much pain": Educational shortfalls among adolescent 'young carers' in the South African AIDS epidemic. *Journal of Adolescent Research, 123*, 1–25.

Cohen, L., Manion, L. & Morrison, K. (2007). *Research Methods in Education.* 6th ed. London: Routledge.

Cohran, L. (2007). The promise of narrative career counselling. In K. Maree, Shaping *the Story: A Guide to Narrative Counselling* pp 152–161. Pretoria: Van Schaik.

Compton, W.C. (2000). Meaningfulness as a mediator of subjective well-being. *Psychological Reports, 8*7(1)156-160.

Costello, A.B., & Osborne, J.W. (2005). Best practices in exploratory factor analysis: four recommendations for getting the most from your analysis*. Practical Assessment, Research & Evaluation, 10*(7), 1-9.

Côté, J.E., & Schwartz, S.J. (2002). Comparing psychological and sociological approaches to identity: identity status, identity capital, and the individualization process. *Journal of Adolescence,* 25, 571-586.

Creswell, J.W. (2003). *Research Design: Qualitative, Quantitative and Mixed Methods Approaches.* 2nd ed. Thousand Oaks, CA: Sage.

Creswell, J.W. (2013). *Research Design: Qualitative, Quantitative and Mixed Methods Approaches.* 4th ed. Thousand Oaks, CA: Sage.

Cross, S.E., Markus, H.R. (1994). Self-schemas, possible selves and competent performance. *Journal of Educational Psychology, 86*(3), 423-438

Csikszentmihalyi, M. (1990). Literacy and intrinsic motivation. *Literacy in America, 119*(2), 115–140

Damon, W., Menon, J., & Bronk, K.C. (2003). The development of purpose during adolescence. *Applied Developmental Science, 7*(3), 119-128.

Dass-Brailsford, P. (2005). Exploring resiliency: Academic achievement among disadvantaged black youth in South Africa. *South African Journal of Psychology, 35*(3), 574–591.

David, A.P. (2014). Analysis of the separation of task-based and self-based achievement goals in a Philippine sample. *Psychological Studies, 59*(4), 365-373.

Davids, E.L., & Roman, V. (2014). A systematic review of the relationship between parenting styles and children's physical activity. *African Journal for Physical, Health Education, Recreation and Dance, 2*(1), 228-246.

Davis, C.G., Nolen-Hoeksema, S., & Larson, J. (1998). Making sense of loss and benefitting from the experience: two construals of meaning. *Journal of Personality and Social Psychology, 75*(2), 561-574.

Davis, W.E., Kelley, N.J., Tang, D., & Hicks, J.A. (2016). Motivating the academic mind: high-level construal of academic goals enhances goal meaningfulness, motivation and self-concordance. *Motivation and Emotion, 40*(2), 193-202.

de Bilde, J., Vansteenkiste, M., & Lens, W. (2011). Understanding the association between future time perspective and self-regulated learning through the lens of self-determination theory. *Learning and Instruction, 21*(3), 332-344.

De Naeghel, J., Van Keer, H., Vansteenkiste, M. & Rosseel, Y. (2012). The relation between elementary students' recreational and academic reading motivation, reading fluency, engagement, and comprehension: a self-determination theory perspective. *Journal of Educational Psychology, 104*(4), 1006–1021.

De Vos, A.S., Strydom, H., Fouche, C.B. & Delport, C.S. (2003). *Research at Grass Roots: for the Social Sciences and Human Service Professions.* 2nd ed. Pretoria: Van Schaik.

Deci, E.L. & Ryan, R.M. (2000). The what and why of goal pursuits: human needs and self-determination of behaviour. *Psychological Inquiry*, *11*(4), 95–123.

Deci, E.L., & Ryan, R.M. (1985). *Intrinsic motivation and self-determination in human behaviour*. New York, NY: Plenum.

Deci, E.L., & Ryan, R.M. (2002). *Handbook of Self-determination Research*. New York: University of Rochester Press.

Deci, E.L., & Ryan, R.M. (2008). Hedonia, eudaimonia and well-being: an introduction. Journal of Happiness Studies, 9, 1-11.

Deci, E.L., Eghrari, H., Patrick, B.C., & Leone, D. (1994). Facilitating internalization: the self-determination theory perspective. *Journal of Personality, 62*(1), 119-142.

Deci, E.L., Hodges, R., Pierson, L. & Tomassone, J. (1992). Autonomy and competence as motivational factors in students with learning disabilities and emotional handicaps. *Journal of Learning Disabilities, 25*(7), 457–471.

Demerath, L. (2006). Epistemological identity theory: reconceptualising commitment as self-knowledge. *Sociological Spectrum, 26*(5), 491-517.

Denzin, N.K. & Lincoln, Y.S. (1994). *Handbook of Qualitative Research*. California: Sage.

Department of Basic Education. (2011). *NEIMS (National Education Infrastructure Management System) Reports May 2011*. Pretoria: Government Printer.

Department of Basic Education. (2014). *National Senior Certificate Examination 2014: Technical Report.* Pretoria: Government Printer.

Department of Education. (2009). *National Minimum Norms and Standards for School Infrastructure*. Pretoria: Government Printer.

Devos, T. & Banaji, R. (2003). Implicit self and identity. In M.R. Leary & J.P. Tangey (Eds). *Handbook of Self and Identity* (pp. 153–175). London: Guildford Press.

Dezutter, J., Luyckx, K., & Wachholtz, A. (2015). Meaning in life in chronic pain patients over time: associations with pain experiences and psychological well-being. *Journal of Behavioural Medicine, 38(*2), 384-396.

Dieferndorff, J.M., & Lord, R.G. (2008). Self-regulation and goal striving processes. In R. Kanter., G. Chen., & R. Pritchard (Eds.)., *Work Motivation: Past, Present, and Future,* (pp 151-196). New Jersey: Lawrence Erlbaum & Associates.

Dörnyei, Z., & Ushioda, E. (2011). *Teaching and Researching Motivation* (2nd ed). Harlow: Longman.

Duckworth, A.L. & Seligman, E.P. (2005). Self-discipline outdoes IQ in predicting academic performance in adolescents. *Psychological Science, 16*(12), 939–934.

Dunteman, G.H. (1989). *Principal Components Analysis*. Newbury Park: SAGE Publishers.

Duriez, B., Luyckx, K., Soenens, B., & Berzonsky, M. (2012). A process-content approach to adolescent identity formation: examining longitudinal associations between identity styles and goal pursuits. *Journal of Personality, 80*(1), 135-161.

Dweck, C.S., & Elliot, E.S. (1983). Achievement motivation. In P.H. Mussen & E.M. Hetherington (Eds.). *Handbook of Child Psychology: Social and Personality Development,* (pp 643-691).

Dweck, C.S., & Leggett, E.L. (1988). A social-cognitive approach to motivation and personality. *Psychological Review*, 95, 256-273.

Dweck, C.S., & Molden, D. (2005). Self-theories: their impact on competence motivation and acquisition. In A. J. Elliot & C.S. Dweck (Eds.). *Handbook of Competence and Motivation*, (pp 122-140). New York: The Guilford Press.

Ebersohn, L. (2007). Utilizing reminiscences: constructing boxes of memories to tell stories for life choices. In K. Maree, Shaping *the Story: A Guide to Narrative Counselling* pp. 152–161. Pretoria: Van Schaik.

Eccles, J.S. (2009). Who am I and what am I going to do with my life? Personal and collective identities as motivators of action. *Educational Psychologist, 44*(2), 78-89.

Eccles, J.S. (2005). Subjective task value and the Eccles et al. model of achievement-related choices. In A.J. Elliot & C.S. Dweck (Eds.). *Handbook of Competence and Motivation*, (pp 105-122). New York: The Guilford Press.

Eccles, J.S., & Wigfield, A. (1995). In the mind of the actor: the structure of adolescents' achievement task values and expectancy-related beliefs. *Personality and Social Psychology Bulletin, 21*, 215-225.

Eccles, J.S., & Wigfield, A. (2002). Motivational beliefs, values, and goals. *Annual Review of Psychology, 53*, 109-132.

Eccles, J.S., Midgley, C., & Adler, T. (1989). Grade-related changes in the school environment: effects on achievement motivation. In J.G. Nicolls (Ed.). The Development of Achievement Motivation. Greenwich: JAI Press.

Edwards, M.J., & Holden, R.R. (2001). Coping, meaning in life, and suicidal manifestations: examining gender differences. *Journal of Clinical Psychology, 57*(12), 1517-1534.

Efron, B., Tibshirani, J.J. (1994). *An Introduction to the Bootstrap.* London: Chapman & Hall

Elliot, A.J., McGregor, H., & Gable, S. (1999). Achievement goals, study strategies and exam performance: a mediational analysis. *Journal of Educational Psychology, 91*, 549-563.

Elliot, A.J., Murayama, K., & Pekrun, R. (2011). A 3 x 2 achievement goal model. *Journal of Educational Psychology, 103*(3), 632-648.

Emmanuel, A., Adom, E.A., Josephine, B., & Solomon, F.K. (2014). Achievement motivation, academic self-concept and academic achievement among high school students. European Journal of Research and Reflection in Educational Sciences, 2(2), 24-37.

Emmons, R.A. (1989). The personal striving approach to personality. In L.A. Pervin (Ed.). *Goal Concepts in Personality and Social Psychology* (pp. 87–126). NJ: Laurence Erlbaum and Associates.

Emmons, R.A. (2005). Striving for the sacred: personal goals, life meaning and religion. *Journal of Social Issues, 61*(4), 731-745.

eNCA. *KZN top achiever inspires community* (2014, January 14). Retrieved from: http://www.enca.com/south-africa/kzn-top-achiever-inspires-community

Engelbrecht, J. & Harding, A. (2008). The impact of transition to outcomes-based teaching on university preparedness in mathematics in South Africa. *Mathematics Educational Research Journal, 20*(2), 57–70.

English, T., & Chen, S. (2007). Culture and self-concept stability: consistency across and within contexts among Asian Americans and European Americans. *Journal of Personality and Social Psychology, 93*(3), 478-490.

Erikson, E. (1968*). Identity: Youth and Crisis*. New York, NY: Norton.

Erikson, M.G. (2007). The meaning of the future: toward a more specific definition of possible selves. *Review of General Psychology, 11*(4), 348-358.

Fan, X., Thompson, B. & Wang, L. (1999). Effects of sample size, estimation method, and model specification on structural equation modeling fit indexes. *Structural Equation Modeling, 6,* 56–83

Feist, J., & Feist, G.J. (2008). *Theories of Personality 7th ed*. New York: McGraw-Hill

Feldman, D.B., & Kubota, M. (2014). Hope, self-efficacy, optimism, and academic achievement: distinguishing constructs and levels of specificity in predicting college grade-point average. *Learning and Individual Differences, 37*, 210-216.

Ferla, J., Valcke, M., & Schuyten, G. (2010). Judgements of self-perceived academic competence and their differential impact on students' achievement motivation. Learning approach, and academic performance. *European Journal of Psychology of Education, 25*(4), 519-536.

Filak, V.F. & Sheldon, K.M. (2008). Teacher support, student motivation, student need satisfaction, and college teacher course evaluations: testing a sequential path model. *Educational Psychology: An International Journal of Experimental Educational Psychology, 28*(6), 711–724.

Filak, V.F., & Sheldon, K.M. (2003). Student psychological need satisfaction and college teacher-course evaluations. *Educational Psychology: An International Journal of Experimental Educational Psychology, 3,* 235-247.

Finn, J.D. (1989). Withdrawing from school. *Review of Educational Research*, *59*(2), 117–142.

Fleisch, B. (2008). *Primary Education in Crisis: Why South African School Children Underachieve in Reading and Mathematics*. Cape Town: Juta.

Flink, C., Boggiano, A.K. & Barett, M. (1990). Controlling teaching strategies: Undermining children's self-determination and performance. *Journal of Personality and Social Psychology, 59(5)*, 916–924.

Fortier, M.S., Vallerand, R.J. & Guay, F. (1995). Academic motivation and school performance: toward a structural model. *Contemporary Educational Psychology, 20*, 257–276.

Frankl, V.E. (1969). *The Will to Meaning: Foundations and Applications of Logotherapy*. New York: Washington Square Press.

Frankl, V.E. (1978). *The Unheard Cry for meaning: Psychotherapy and Humanism*. New York: Simon & Schuster.

Freud, S. (1923). *The Ego and the Id*. London: The Hogarth Press Ltd.

Fritz, E. & Beekman, L. (2007). Engaging clients actively in telling stories and actualizing dreams. In K. Maree, *Shaping the Story: A Guide to Narrative Counselling* pp. 163–175. Pretoria: Van Schaik.

Gagné, M., Senécal, C.B., & Koestner, R. (1997). Proximal job characteristics. Feelings of empowerment, and intrinsic motivation: a multidimensional model. *Journal of Applied Social Psychology,* 27(14), 1222-1240.

Gallagher, S. (2000). Philosophical conceptions of the self: implications for cognitive science. *Trends in Cognitive Sciences, 4*(1), 14-21.

Garson, G. D. (2014). *Path Analysis*. North Carolina: Statistical Associates.

Gaudreau, P. (2012). Goal self-concordance moderates the relationship between achievement goals and indicators of academic adjustment. *Learning and Individual Differences, 22*, 827-832.

George, D. & Mallery, P. (2010) *IBM SPS Statistics 19 Step by Step: A Simple Guide and Reference.* 12th ed. New York, NY: Pearson.

George, L.S., & Park, C.L. (2013). Are meaning and purpose distinct? An examination of correlates and predictors. *The Journal of Positive Psychology, 8*(5), 365-375.

George, L.S., & Park, C.L. (2016). Meaning in life as comprehension, purpose and mattering: toward integration and new research questions. *Review of General Psychology, 20*(3), 205-220.

Gillet, N., Vallerand, R.J. & Lafrenière, M.K. (2012). Intrinsic and extrinsic school motivation as a function of age: the mediating role of autonomy support. *Social Psychology Education*, *15*, 77–95.

Gillet, N., Vallerand, R.J., Amoura, S., & Baldes, B. (2010). Influence of coaches' autonomy support on athletes' motivation and sport performance. A test of the hierarchical model of intrinsic and extrinsic motivation. *Psychology of Sport and Exercise, 11*, 155-161.

Ginsburg, C., Richter, L.M., Fleisch, B. & Norris, S.A. (2011). An analysis of associations between residential and school mobility and educational outcomes in South African urban children: the birth to twenty cohort. *International Journal of Educational Development*, *31,* 213–222.

Gollwitzer, P.M., Marquardt, M.K., Scherer, M. & Fujita, K. (2012). Identity-goal threats: engaging in distinct compensatory effors. *Social Psychological and Personality Science*, *4*(5), 555–562.

Gradstein, M., & Justman, M. (2002). Social cohesion, and economic growth. *The American Economic Review, 92*(4), 1192-1204.

Grant, M.J. & Hallman, K. (2008). Pregnancy-related school dropout and prior school performance in KwaZulu-Natal South Africa. *Adolescent Sexual and Reproductive Health in Sub-Saharan Africa, 39*(4), 369–382.

Gregg, A.P., Sedikides, C. & Gebauer, J.E. (2011). Dynamics of identity: between self-enhancement and self-assessment. In S.J. Schwartz, K. Luyckx & V.L. Vignoles (Eds). *Handbook of Identity Theory and Research* pp. 305–327. New York, NY: Springer.

Groff, R. (2013). *Critical Realism*, *Post Positivism and the Possibility of Knowledge*. London: Routledge.

Grolnick, W.S. & Ryan, R.M. (1989). Parent styles associated with children's self-regulation and competence in school. *Journal of Educational Psychology, 81*(2), 143–154.

Grolnick, W.S. & Slowiaczek, M.L. (1994). Parents' involvement in children's' schooling: a multidimensional conceptualization and motivational model. *Child Development, 65*(1), 237–252.

Grolnick, W.S., Ryan, R.M. & Deci, E.L. (1991). Inner resources for school achievement: motivational mediators of children's perceptions of their parents. *Journal of Educational Psychology, 83*(4), 508–517.

Groot, W., & van den Brink, H. (2004). A direct method for estimating the compensating income variation of severe headache and migraine. *Social Science Medicine, 58*(2), 305-314.

Grouzet, F.M.E., Kasser, T., Ahuvia, A., Miguel, K., Dols, F., Kim, Y. Lau, S., Ryan, R.M., Saunders, S., Schmuck, P., & Sheldon, K.M. (2005). The structure of goal content across 15 cultures. *Journal of Personality and Social Psychology, 89*(5), 800-815.

Guay, F., Boggiano, A.K. & Vallerand, R.J. (2001) Autonomy support, motivation and perceived competence: conceptual and empirical linkages. *Personality and Social Bulletin, 27*, 643–650.

Guay, F., Mageau, G.A., & Vallerand, R.J. (2003). On the hierarchical structure of self-determined motivation: a test of top-down, bottom-up, reciprocal, and horizontal effects. *Personality and Social Psychology Bulletin, 29*, 89-98.

Guay, F., Ratelle, C., & Litalien, D. (2010). Academic self-concept, autonomous academic motivation, and academic achievement: mediating and additive effects. *Learning and Individual Differences, 20*, 644-653.

Guba, E. G. & Lincoln, Y. S. (1994). Competing paradigms in qualitative research. In N. K. Denzin & Y. S. Lincoln (Eds.). *Handbook of Qualitative Research* pp. 105–117. Thousand Oaks, CA: Sage.

Gunnell, K.E., Crocker, P.R.E., Mack, D.E., Wilson, P.M. & Zumbo, B.D. (2014). Goal contents, motivation, psychological need satisfaction, well-being and physical activity: a test of self-determination theory over 6 months. *Psychology of Sport and Exercise, 15*, 19–29.

Gushue, G.V., Mejia-Smith, B.X., Fisher, L.D., Cogger, A., Gonzalez-Matthews, M., Lee, Y., Mancusi, L., McCullough, R., Connell, M.T., Weng, W.C., Cheng., & Johnson, V. (2013). Differentiation of self and racial identity. *Counselling Psychology Quarterly, 26*(3), 343-361.

Hadre, P.L. & Reeve, J. (2003). A motivational model of rural students' intentions to persist in, versus drop out of high school. *Journal of Educational Psychology, 95* (2), 347–356.

Hair, J.F., Black, B., Babin, B., Anderson, R.E., & Tatham, R.L. (2006). *Multivariate Data Analysis, 6th ed.* New York: Pearson Education.

Hammack, P.L. (2015). Theoretical foundations of identity. In K.C. McLean & M. Syed, *The Oxford Handbook of Identity Development*, (pp 11-30). New York: Oxford University Press.

Hancock, G.R. & Meuller, R.O. (2013). *Structural Equation Modelling: a Second Course.* 2nd ed. Charlotte, SC: Information Publishing.

Harackiewicz, J.M., Barron, K.E., Tauer, J.M., & Elliot, A.J. (2002). Predicting success in college: a longitudinal study of achievement goals and ability measures as predictors of interest and performance from freshman year through graduation. *Journal of Educational Psychology, 94*, 562-575.

Harackiewicz, J.M., Rozek, C.S., Hulleman, C.S., & Hyde, J.S. (2012). Helping parents to motivate adolescents in mathematics and science: an experimental test of utility-value intervention. *Psychological Science, 23*(8), 899-906.

Harrington, D. (2009). *Confirmatory Factor Analysis*. New York: Oxford University Press.

Harrison, M.G., Malaka, D., Amoateng, A.Y., & Toldson, I. (2005). Perceived competence of rural South African and African-American families: A cross-cultural assessment of structural validity. *Ethnicity & Disease, 15*, 379-392

Hatcher, L. & O'Rourke, N. (2013). *A Step-By-Step approach to using SAS for Factor Analysis and Structural Equation Modelling.* 2nd ed. North Carolina: SAS Publishing.

Heine, S.J., Proulx, T., & Vohs, K.D. (2006). The meaning maintenance model: on the coherence of social motivations. *Personality and Social Psychology Review, 10*(2), 88-110.

Heintzelman, S.J., & King, L.A. (2014). (The feeling of) Meaning-as-information. *Personality and Social Psychology Review,* 18, 153-167.

Higgins, E.T. (1987). Self-discrepancy: a theory relating to self and affect. *Psychological Review, 94*(3), 319-340.

Hill, C.E., Kanazawa, Y. Knox, S., Schauerman, I., Loureiro, D., James, D., Carter, I., King, S., Razzak, S., Scarff, M., & Moore, J. (2015). Meaning in life in psychotherapy: the perspective of experienced psychotherapists. *Psychotherapy Research, 17*, 1-16.

Ho, M.Y., Cheung, F.M., & Cheung, S.F. (2010). The role of meaning in life and optimism in promoting well-being. *Personality and Individual Differences, 48*, 658-663.

Hodgins, S.H., & Knee, R.C. (2002). The integrating self and conscious experience In E.L. Deci., & R.M. Ryan (Eds.), *Handbook of Self-Determination Research*, (pp 87-100), New York: University of Rochester Press.

Hofer J, & Busch H. (2011). Satisfying one's needs for competence and relatedness: consequent domain-specific well-being depends on strength of implicit motives. *Personality & Social Psychology Bulletin, 37*(9), 1147-58.

Hofer, J., Busch, H. & Kartner, J. (2011). Self-regulation and well-being: The influence of identity and motives. *European Journal of Personality, 25*, 211–224.

Holmbeck, G.N. (1997). Toward terminological, conceptual, and statistical clarity in the study of mediators and moderators: Examples from the child-clinical and pediatric psychology literatures. *Journal of Consulting and Clinical Psychology, 65*(4), 599–610.

Honora, D.T. (2002). The relationship of gender and achievement to future outlook among African-American adolescents. *Adolescence, 37*(146), 264–284.

Hooper, D., Coughlan, J. & Mullen, M. (2008). Structural equation modelling: guidelines for determining model-fit. *Electronic Journal of Business Research Models, 6*(1), 53–60.

Houston, S. (2010). Prising open the black box: critical realism, action research and social work. *Qualitative Social Work, 9*, 154–178.

Howie, S.J., Scherman, V., & Venter, E. (2008). The gap between advantaged and disadvantaged students science achievement in South African secondary schools. *Educational Research and Evaluation, 14*(1), 29-46

Howie, S.J., van Staden, S. Tshele, M., Dowse, C., & Zimmerman, L. (2012). *PIRLS 2011 South African Children's Literacy Achievement.* Centre for Evaluation and Assessment: University of Pretoria.

Hoyle, R.H., & Sherrill, M.R. (2006). Future orientation in die self-system: possible selves, self-regulation, and behaviour. *Journal of Personality, 74* (6), 1673-1696.

Hu, L.T., & Bentler, P. (1995). Evaluating model fit. In H.R. Hoyle (Ed.). *Structural Equation Modeling. Concepts, Issues, and Applications* pp. 76–99. London: Sage.

Human Sciences Research Counsel. (2012). *Highlights of TIMSS 2011: The South African Perspective*: Pretoria South Africa

Human-Vogel, S. & Dippenaar, H. (2013). Exploring pre-service student-teacher's' commitment to community engagement in the second year of training. *Higher Education Research & Development, 32(2*), 188–200.

Human-Vogel, S. & Mahlangu, P.P. (2009). Commitment in academic contexts: first year education students' beliefs about the aspects of self, the lecturer and instruction. *South African Journal of Higher Education*, *23(2),* 309–328.

Human-Vogel, S. & Rabe, P. (2015). Measuring self-differentiation and academic commitment in university students: A case study of education and engineering students. *South African Journal of Psychology, 45*(1), 60–70.

Human–Vogel, S. (2008). Students' mental models of positive mood and self-regulation in learning. *South African Journal of Psychology, 43(2),* 613–633.

Human-Vogel, S. (2013). A self-regulatory perspective on commitment in academic and interpersonal contexts. In M.P. Wissing (Ed). *Well-Being Research in South Africa,* (pp 517–537). New York, NY: Springer.

Huta, V., & Ryan, R.M. (2010). Pursuing pleasure or virtue: the differential and overlapping well-being benefits of hedonic and eudaimonic motives. *Journal of Happiness Studies, 11*, 735-762.

Iacobucci, D. (2010). Structural equation modelling: fit indices, sample size, and advanced topics. *Journal of Consumer Psychology, 20*, 90–98.

Iwu, C.G., Gwija, S.A., Benedict, H.O. & Tengeh, R.K. (2013). Teacher job satisfaction and learner performance in South Africa. *Journal of Economics and Behavioural Studies*, *5*(12), 838–850.

Jackson JL, Dezee K, Douglas K, & Shimeall W. (2005). Introduction to structural equation modeling (path analysis). Society of General Internal Medicine (SGIM) Precourse Handout (Online). Retrieved: http://impak.sgim.org/userfiles/file/AMHandouts/AM05/handouts/PA08.pdf.

Jang, H. (2008). Supporting students' motivation, engagement, and learning during an uninteresting activity. *Journal of Educational Psychology, 100*, 798-811.

Jang, H., Reeve, J., & Deci, E.L. (2010). Engaging students in learning activities: it is not autonomy support or structure but autonomy support and structure. *Journal of Educational Psychology, 102*(3), 588-600.

Janoff-Bulman, R., & Frantz, C.M. (1997). The impact of trauma in meaning: from meaningless world to meaningful world. In M. Power & C. Brewin (Eds.), *The Transformation of Meaning in Psychological Therapies: Integrating Theory and Practice.* Sussex: Wiley & Sons.

Jenkins, R. (2008). *Social Identity.* 3rd ed. New York, NY: Routledge.

Jeno, L. & Diseth, Å. (2014). A motivational model of autonomy-support, autonomous motivation, and perceived school performance: a self-determination theory perspective. *Reflecting Education, 9,* 1–20.

Kanat-Maymon, Y., Benjamin, M., Stavsky, A., Shoshani, A., & Roth, G. (2015). The role of basic need fulfilment in academic dishonesty: a self-determination theory perspective, *Contemporary Educational Psychology, 43*, 1-9.

Kanter, R.M. (1968). Commitment and social organization: A study of commitment mechanisms in utopian communities. *American Sociological Review, 33(*4), 499–517.

Kao, G. (2000). Group images and possible selves among adolescents: Linking stereotypes to expectations by race and ethnicity. *Sociological Forum, 15*(3), 407–430.

Kasser, T., & Ryan, R.M. (1996). Further examining the American dream: differential correlates of intrinsic and extrinsic goals. *Personality and Social Psychology Bulletin, 22*, 280-287.

Kasser, T., Dungan, N., Rosenblum, K.L., Sameroff, A.J., Deci, E.L., Niemiec, C.P., Ryan, R.M., Osp, A., Bond, R., & Dittmar, H. (2014). Changes in materialism, changes in psychological well-being: evidence from three longitudinal studies an intervention experiment. *Motivation and Emotion, 38,* 1-22.

Katz, I., & Cohen, R. (2014). Assessing autonomous motivation in students with cognitive impairment. *Journal of Intellectual and Developmental Disability, 39*(4), 323-332.

Katz, I., Elliot, K., & Nevo, N. (2014). "I'll do it later": Type of motivation, self-efficacy and homework procrastination. *Motivation and Emotion, 38*, 111-119.

Keith, T.Z. (2015). *Multiple Regression and Beyond: An Introduction to Multiple Regression and Structural Equation Modelling.* New York: Routledge.

Klein, H.J., Wesson, M.J., Hollenbeck, J.R., & Alge, B.J. (1999). Goal commitment and the goal-setting process: conceptual clarification and empirical synthesis. *Journal of Applied Psychology, 84*(6), 885-896.

Kleintjies, S., Fisher, A.J., Railoun, A., Lund, C., Molteno, C. & Robertson, B.A. (2006). The prevalence of mental disorders among children, adolescents and adults in the Western Cape, South Africa. *South African Psychiatry Review*, *9*, 157–160.

Kline, P. (1994). *An Easy Guide to Factor Analysis*. New York: Routledge.

Kline, R.B. (2010). *Principles and Practice of Structural Equation Modelling.* 3rd ed. New York, NY: Guildford Press.

Klinger, E., & Cox, W.M. (2004). Motivation and the theory of current concerns. In W.M Cox & E. Klinger (Eds.), *Handbook of Motivational Counselling: Concepts, Approaches, and Assessment,* (pp 3-27). New York: John Wiley & Sons Ltd.

Koestner, R., Lekes, N., Powers, T.A., & Chicoine, E. (2002). Attaining personal goals: self-concordance plus implementation intentions equals success. *Journal of Personality and Social Psychology, 83*(1), 231-244.

Komarraju, M., & Nadler, D. (2013). Self-efficacy and academic achievement: why do implicit beliefs, goals, and effort regulation matter? *Learning and Individual Differences, 25*, 67-72.

Krapp, A. (1999). Interest, motivation and learning: an educational-psychological perspective. *European Journal of Psychology, 4*(1), 23-40.

Krauss, S.E. (2005). Research paradigms and meaning making: a primer. *The Qualitative Report, 10*(4), 756–770.

Kroger, J. (2006). Identity development during adolescence. In G.R. Adams & M.D. Berzonsky (Eds.), *Blackwell Handbook of Adolescence,* (pp 205-226). Maiden: Blackwell Publishing.

Kroger, J., & Marcia, J.E. (2011). The identity statuses: origins, meanings, and interpretations. In S.J. Schwartz, K. Luyckx & V.L. Vignoles (Eds). *Handbook of Identity Theory and Research* (pp. 31-53). New York: Springer.

Ku, L., Dittmar, H., Banerjee, R. (2014). To have or to learn? The effects of materialism on British and Chinese children's learning. *Journal of Personality and Social Psychology, 106*(5), 803-821.

Kuh, G.D. (2009). What student affair professionals need to know about student engagement. *Journal of College Student Development, 50*(6), 683–706.

Kusurkar RA, Croiset G, & Cate TJ. (2011). Twelve tips to stimulate intrinsic motivation in students through autonomy-supportive classroom teaching derived from self-determination theory. *Medical Teacher, 33*(12), 978-82.

Kusurkar, R.A., Cate, T.J.T., Vos, C.M.P., Westers, P. & Croiset, G. (2013). How motivation affects academic performance: A structural equation modelling analysis. *Advances in Health Science Education, 18*(1), 57–69.

Kyndt, E., Dochy, F., Struyven, K., & Cascallar, E. (2011). The direct and indirect effect of motivation for learning on students' approaches to learning through the perceptions of workload and complexity. *Higher Education Research and Development, 30*(2), 135-150.

La Guardia, J.G. (2009). Developing who I am: A self-determination theory approach to the establishment of healthy identities. *Educational Psychologist*, *44*(2), 90–104.

La Guardia, J.G., Ryan, R.M., Couchman, C.E. & Deci, E.L. (2000). Within-person variation in security of attachment: a self-determination theory perspective on attachment, need fulfilment, and well-being. *Journal of Personality and Social Psychology, 79*(3), 367–384.

Lafi, S., & Kaneene, J.B. (1992). An explanation of the use of principal components analysis to detect and correct for multicollinearity. *Preventative Veterinary Medicine, 13*(4), 261-275.

Lam, D., Ardington, C., & Leibrandt, M. (2011). Schooling as a lottery: racial differences in school advancement in urban South Africa, *Journal of Developing Economics, 95(2*), 121- 136.

Langkamp, D.L., Lehman, A. & Lemeshaw, S. (2010). Techniques for handling missing data in secondary analysis of large surveys. *Academic Paediatrics, 10*(3), 205–210.

Layous, K., Nelson, K. & Lyubomirsky, S. (2012). What is the optimal way to deliver a positive activity intervention? The case of writing about one's best possible selves. *Journal of Happiness Studies*, *14*, 635–654.

Le, B. & Agnew, C.R. (2003). Commitment and its theorized determinants: a meta-analysis of the investment model. *Personal Relationships, 10*, 37–57.

Leary, M.R., & Tangney, J.P. (2003). The self as organizing construct in the behavioural and social sceinces. In M.R., Leary., & J.P. Tangney (Eds.), *Handbook of Self and Identity 2nd ed*, (pp 1-20). New York: The Guilford Press.

Lee, D., Coladarci, T. & Donaldson, G. A. (1996). *Effects of School Choice on Academic Commitment and Academic Achievement: Evidence from NELS: 88*. Paper presented at the Annual Meeting of the American Educational Research Association, New York, April 8-12, 1996

Lekes, N., Gingras, I., Philippe, E.L., Koestner, R., & Fang, J. (2010). Parental autonomy-support, intrinsic life goals, and well-being among adolescents in China and North America. *Journal of Youth and Adolescence, 39*(8), 858-869.

Leptokaridou, E.T., Vlachopoulos, S.P., & Papaioannou, A.G. (2015). Experimental longitudinal test of the influence of autonomy-supportive teaching on motivation for participation in elementary school physical education. *Educational Psychology: An International Journal of Experimental Educational Psychology, 12*, 105-128.

Levesque, C.S., Williams, G.C., Elliot, D., Pickering, M.A. Bodenhamer, B. & Finley, P.J. (2007). Validating the theoretical structure of the treatment self-regulation questionnaire (TSRQ) across three different health behaviours. *Health Education Research*, *22*(5), 691–702.

Levy, F., & Murnane, R.J. (2004). *The New Division of Labor: How Computers are Creating the Next Job Market*. New Jersey: Princeton University Press.

Liddell, C., & Rae, G. (2001). Predicting early grade retention: A longitudinal investigation of primary school progress in a sample of rural South African children. *British Journal of Educational Psychology, 71,* 413-428.

Lieberman, M.S. (1998). *Commitment, Value and Moral Realism*. Cambridge: Cambridge University Press.

Little, B.R. (1993). Personal projects and the distributed self: aspects of conative psychology. In J. Suls (Ed.), *The Self in Social Perspective: Psychological Perspectives on the Self,* (pp 157-185). New York: The Guilford Press.

Lochner, L., Moretti, E. (2004). The effect of education on crime: evidence from prison inmates, arrests, and self-reports. *American Economic Review, 94*(1), 155-189.

Locke, E. A., Shaw, K. N., Saari, L. M. & Latham, G. P. (1981). Goal-setting and task performance: 1969–1980. *Psychological Bulletin*, *90,* 125–152.

Locke, E.A. (1968). Towards a theory of task motivation and incentives. *Organizational Behaviour and Human Performance, 3,* 157-189.

Locke, E.A. (1991). Goal theory vs. control theory: contrasting approaches to understand work motivation. *Motivation and Emotion, 15*(1), 9-28.

Lonsdale, C., Hall, A.M., Williams, G.C., McDonough, S.M., Ntoumanis, N., Murray, A. & Hurley, D. (2012). Communication style and exercise compliance in physiotherapy (CONNECT). A cluster randomized controlled trail to test a theory-based intervention to increase chronic low back pain patients' adherence to physiotherapists' recommendations: study rationale, design, and methods. *Musculoskeletal Disorders*, *13*, 104–114.

Lord, R.G., Diefendorff, J.M., Schmidt, A.M. & Hall, R.J. (2010). Self-regulation at work. *Annual Review of Psychology, 61*, 543–568.

Losier, G.F., & Koester, R. (1999). Intrinsic versus identified regulation in distinct political campaigns: the consequences of following politics for pleasure versus personal meaningfulness. *Personality and Social Psychology Bulletin, 25*(3), 287-298.

Lutz, W., Cuaresma, J.C. & Sanderson, W. (2008). The demography of educational attainment and economic growth. *Science, 319* (5866), 1047–1048.

Luyckx, K., Goossens, L., Soenens, B., & Beyers, W. (2006). Unpacking commitment and exploration: preliminary validation of an integrative model of late adolescent identity formation. *Journal of Adolescence, 29*, 361-378.

Luyckx, K., Schwartz, S.J., Goossens, L., Beyers, W., & Missotten, L. (2011). Process of personal identity formation and evaluation. In S.J. Schwartz, K. Luyckx & V.L Vignoles (Eds). *Handbook of Identity Theory and Research* (pp. 77-98). New York: Springer.

Luyckx, K., Schwartz, S.J., Soenens, S., Vansteenkiste, M., & Goossens, L. (2010). The path from identity commitments to adjustment: motivational underpinnings and mediational mechanisms. *Journal of Counselling and Development, 88,* 52-60.

Luyckx, K., Soenens, B., Berzonsky, M.D., Goossens, L., & Vansteenkiste, M. (2007). Parenting, Identity information, and college adjustment: a mediation model with longitudinal data. Identity: *An International Journal of Theory and Research, 7*(4), 309-330

Luyckx, K., Soenens, B., Berzonsky, M.D., Smits, I., Goossens, L., & Vansteenkiste, M. (2007). Information-orientated identity processing, identity consolidation, and well-being: the moderating role of autonomy, self-reflection, and self-rumination. *Personality and Individual Differences, 43,* 1099-1111.

Luyckx, K., Vansteenkiste, M., Goossens, L., & Duriez, B. (2009). Basic need satisfaction and identity formation: bridging self-determination theory and process-oriented identity research. *Journal of Counselling Psychology, 56*, 276-288.

Mabogoane, T. & Pereira, C. (2008) *Using trends to hold schools accountable.* Presentation to the Association for Evaluation and Assessment in South Africa Conference, Pretoria, November 2008.

MacKenzie, M.J., & Baumeister, R.F. (2014). Meaning in life: nature needs and myths. In A. Batthyany., & P. Russo-Netzer (Eds.), *Meaning in Positive and Existential Psychology,* (pp 25-37). New York: Springer.

MacKinnon, D.P., Warsi, G. & Dwyer, J.H. (2010). A simulation study of mediated effect measures. *Multivariate Behavioural Research, 30*(1), 41–54.

Makgato, M., & Mji, A. (2006). Factors associated with high school learners' poor performance: A spotlight on mathematics and physical science. *South African Journal of Education*, *26*(2), 253–266.

Manolio, T.A., Bailey-Wilson, J.E. & Collins, F.S. (2006). Genes, environment and the value of prospective cohort studies. *Nature Reviews Genetics*, *7*, 812–820.

Marcia, J.E. (1966). Development and validation of ego identity status. *Journal of Personality and Social Psychology*, *3*, 551–558.

Marcia, J.E. (1980). Identity in adolescence. In J. Adelson (Ed). *Handbook of Adolescent Psychology* pp. 157–189. New York, NY: Wiley.

Maree, K. (2007). *First Steps in Research.* Pretoria: Van Schaik.

Markland, D., Ryan, R.M., Tobin, V.J., & Rollnick, S. (2005). Motivational interviewing and self-determination theory. *Journal of Social and Clinical Psychology, 24*(6), 811-831.

Markus, H. & Nurius, P. (1987). Possible selves. *American Psychologist*, *41*(9), 954–969.

Martela, F., & Steger, M.F. (2016). The three meanings of meaning in life: distinguishing coherence, purpose and significance. *Journal of Positive Psychology*, 11(5), 531-545.

Martin, A. & Marsh, H.W. (2006). Academic resilience and its psychological and educational correlates: A construct validity approach. *Psychology in the Schools*, *43*(3), 267–282.

Martin, A. (2002). Motivation and academic resilience: developing a model for student enhancement. *Australian Journal of Education. 46*(1), 34–49.

Masita, M.G. (2006). Student motivation: the study approaches of grade 12 learners in township schools. *South African Journal of Higher Education, 20*(3), 486-500.

Maslow, A. (1954). *Motivation and Personality*. New York: Harper.

Masten, A.S. (2012). Risk and resilience in the educational success of homeless and highly mobile children. *Educational Researcher, 41*(9), 363–365.

McAdams, D.P. (1995). What do we know when we know a person? *Journal of Personality, 63*(3), 365-396.

McAdams, D.P. (1996) Personality, modernity, and the storied self: a contemporary framework for studying persons. *Psychological Inquiry, 7*, 295-321.

McAdams, D.P. (2012). Meaning and oersonality. In P.T.P. Wong (Ed.), *The Human Quest for Meaning: Theories, Research and application,* (pp 107-125). New York: Routledge Publishers.

McAdams, D.P., & Manczak, E. (2011). What is a “level” of personality? *Psychological Inquiry, 22*(1), 40-44.

McAdams, D.P., & Zapata-Gietl. C. (2015). Three strands of identity development across the human life course: reading Erik Erikson in full. In K.C. McLean & M. Syed, *The Oxford Handbook of Identity Development*, (pp 81-94). New York: Oxford University Press.

McClelland, D.C. (1961). *The Achieving Society*. New York: Free Press.

McCombs, B.L. (2001). Self-regulated learning and academic achievement. In B.J. Zimmerman & D.H. Schunk (Eds). *Self-Regulated Learning and Academic Achievement: Theoretical Perspectives* pp 63–118. New York, NY: Taylor & Francis.

McKnight, P.E., & Kashdan, T.B. (2009). Purpose in life as a system that creates and sustains health and well-being: an integrative, testable theory. *Review of General Psychology, 13*(3), 242-251.

McMahan, E.A., & Renken, M.D. (2011). Eudaimonic conceptions of well-being, meaning in life, and self-reported wellbeing: initial test of a mediational model. *Personality and Individual Differences, 51*(5), 589-594.

Meece, J.L., Anderman, E.M., & Anderman, L.H. (2006). Classroom goal structure, student motivation, and academic achievement. *Annual Review of Psychology, 57*, 487-503.

Meeus, W., Iedema, J., & Maassen, G.H. (2002). Commitment and exploration as mechanisms of identity development. *Psychological Reports, 90*(3), 771-785.

Mehri, Y., Salari, S.M., Langroundi, M.S., & Baharamizadeh, H. (2011). The relationship between differentiation of self and aspects of identity. *Procedia-Social and Behavioural Sciences, 30*, 733-737.

Meintjies, H., Hall, K., Marera, D., & Boulle, A. (2009). *Child-headed Households in South Africa: A Statistical Brief.* Cape Town: Children's institute, University of Cape Town.

Meng, X.L., & Rosenthal, R.,& Rubin, D.B. (1992). Comparing correlated coefficients. *Quantitative Methods in Psychology, 111*(1), 172-175.

Mertens, D.M. (2015). *Research and Evaluation in Education and Psychology: Integrating Diversity with Qualitative, Quantitative and Mixed methods*. Los Angeles, CA: Sage.

Miller, R.B., & Brikman, S.J. (2004). A model of future orientated motivation and self-regulation. *Educational Psychology Review, 16*(1), 9-33.

Millon, T. & Bloom, C. (2008). *The Millon Inventories: A Practitioner's Guide to Personalized Clinical Assessment.* 2nd ed. London: Guilford Press.

Milyavskaya, M., Gingras, I., Mageau, G.A., Koester, R., Gagnon, H., Fang, J. & Boiché, J. (2009). Balance across contexts: importance of balanced need satisfaction across various life domains. *Personality and Social Psychology Bulletin*, *35*(8), 1031–1045.

Miserando, M. (1996). Children who do well in school: Individual differences in perceived competence and autonomy in above-average children. *Journal of Educational Psychology, 88*, 203–214.

Modisaotsile, B.M. (2012). *The Failing Standard of Basic Education in South Africa*, Policy Brief (72). Africa Institute of South Africa.

Monteith, J.K.L. (1998). Personal and behavioural variables and the self-regulated learning abilities of African learners. *Koers*, *63*(1), 117–129.

Mouratidis, A. Vansteenkiste, M., Michou, A., & Lens, W. (2013). Perceived structure and achievement goals as predictors of students' self-regulated learning and affect and the mediating role of competence need satisfaction. *Learning and Individual Differences, 23*, 179-186.

Mouratidis, A., Vansteenkiste, M., Lens, W., Michou, A., & Soenens, B. (2013). Within-person configurations and temporal relations of personal and perceived parent-promoted aspirations to school correlates among adolescents. *Journal of Educational Psychology, 105*(3), 895-910.

Muijs, D. (2011). *Doing Quantitative Research in Education with SPSS*. 2nd ed. London: Sage.

Muller, F. & Louw, J. (2004). Learning environment, motivation and interest: perspectives of self-determination theory. *South African Journal of Psychology, 34*(2), 1–22.

National Planning Commission (2011). *National Development Plan: Vision for 2030*. Retrieved from: http://www.npconline.co.za/medialib/downloads/home/NPC%20National%20Development%20Plan%20Vision%202030%20-lo-res.pdf

Nel, N. & MÜller, H. (2010). The impact of teachers' limited English proficiency on English second-language learners in South Africa. *South African Journal of Education, 30*(6), 635–650.

Niemiec, C.P. & Ryan, R.M. (2009). Autonomy, competence and relatedness in the classroom: Applying self-determination theory to educational practice. *Theory and Research in Education,* 7(2), 133–144.

Niemiec, C.P., Lynch, M.F., Vansteenkiste, M., Bernstein, J., Deci, E.L. & Ryan, R.M. (2006). The antecedents and consequences of autonomous self-regulation for college: a self-determination perspective on socialization. *Journal of Adolescence, 29,* 761–775.

Niemiec, C.P., Ryan, R.M., & Deci, E.L. (2009). The path taken: consequences of attaining intrinsic and extrinsic aspirations in post-college life. *Journal of Research in Personality, 43*, 291-306.

Nix, G.A., Ryan, R.M., Manly, J.B., & Deci, E.L. (1999). Revitalization through self-regulation: the effects of autonomous and controlled motivation on happiness and vitality. *Journal of Experimental Social Psychology, 35*, 266-284.

Noels, K.A., Clément, R.,& Pelletier, L.G. (1999). Why are you learning a second language? Motivational orientations and self-determination theory. *Language Learning, 50*(1), 57–85.

Norman, C.C. & Aron, A. (2003). Aspects of possible self that predict motivation to achieve or avoid it. *Journal of Experimental Social Psychology*, *39*, 500–507.

Norman, G.R. & Streiner, D.L. (2003). *Pretty Darned Quick Statistics.* 3rd ed. Shelton: PMPH.

North, R.J. & Swann, W.B. (2009). Self-verification 360º: Illuminating the light and dark sides. *Self and Identity, 8*, 131–146.

Ntombela, S. (2011). The progress of inclusive education in South Africa: Teachers' experiences in a select district, KwaZulu-Natal. *Improving Schools, 14*(1), 5–14.

Nurmi, J. (1991). How do adolescents see their future? A review of the development of future orientation and planning. *Developmental Review, 11*, 1-59.

Nurmi, J.E. (2004). Socialization and self-development: channelling, selection, adjustment, and reflection. In R.M. Lerner & L. Steinberg (Eds.), *Handbook of Adolescent Psychology*, (pp 85-124). New York: John Wiley.

Oettingen, G., Mayer, D., Sevincer, A.T., Stephens, E.J., Pak, H., & Hagenah, M. (2009). Mental contrasting and goal commitment: the mediating role of energization. *Personality and Social Psychology Bulletin, 35,* 608-622.

Olobatuyi, M.E. (2006). *A User's Guide to Path Analysis*. Lanham: University Press of America.

Olusola, O. (2013). Perceived competence, teacher autonomy support and parent attachment as predictors of students' academic achievement. *European Journal of Business and Social Sciences, 1*(12), 133–140.

Otis, N., Grouzet, F.M.E. & Pelletier, L.G. (2005). Latent motivational change in an academic setting: a longitudinal study. *Journal of Educational Psychology, 97(*2), 170–183.

Owens, R.L. & Patterson, M.M. (2013). Positive psychological interventions for children: A comparison of gratitude and best possible selves approaches. *Journal of Genetic Psychology*, *174*(4), 403–426.

Oyserman, D. & Destin, M. (2010). Identity-based motivation: implications for intervention. *Consumer Psychology*, *38*(7), 1001–1043.

Oyserman, D. & James, L. (2011). Possible Identities. In S.J. Schwartz, K. Luyckx, & V.L. Vignoles (Eds.). *Handbook of Identity Theory and Research* pp. 117–145. New York, NY: Springer.

Oyserman, D. & Markus, H.R. (1990a). Self as Social Representation. In U. Flick (Eds.) *The Psychology of the Social* (pp 108–125). Cambridge: Cambridge University Press.

Oyserman, D. (2007). Social identity and self-regulation. In A.W. Kruglanski & E.T. Higgins (Eds.), Social Psychology: *Handbook of Basic Principles 2nd ed,* (pp 432-453). New York: Guilford Press.

Oyserman, D. (2015). Identity-Based Motivation. In R. Scott & S. Kosslyn (Eds). *Emerging Trends in the Social and Behavioral Sciences.* DOI: 10.1002/9781118900772.

Oyserman, D., & Markus, H.R. (1998). Self as social representation. In U. Flick (Ed.), *The Psychology of the Social,* (pp 107-125). Cambridge: Cambridge University Press.

Oyserman, D., Bybee, D. & Terry, K. (2006). Possible selves and academic outcomes: How and when possible selves impel action. *Journal of Personality and Social Science, 91*(1), 188–204.

Oyserman, D., Bybee, D., Terry, K. & Hart-Johnson, T. (2004). Possible selves as roadmaps. *Journal of Research in Personality, 38,* 130–149.

Oyserman, D., Fryberg, S.A., & Yoder, N. (2007). Identity-based motivation and health. *Journal of Personality and Social Psychology,* 93(6), 1011-1023.

Oyserman, D., Gant, L., & Ager, J. (1995). A socially contextualized model of African American identity: possible selves and school persistence. *Journal of Personality and Social Psychology, 69*(6), 1216.

Oyserman, D., Johnson, E., & James, L. (2011). Seeing the destination but not the path: effects of socioeconomic disadvantage on school-focused possible self content and linked behavioural strategies. *Self and Identity, 10*(4), 474-492.

Pallant, J. (2001). *SPSS Survival Manual.* Maidenhead, PA: Open University Press.

Park, C.L. (2010). Making sense of meaning literature: an integrative review of meaning making and its effects on adjustment to stressful life events. *Psychological Bulletin, 136*(2), 257-301.

Park, C.L., & Folkman, S. (1997). Meaning in the context of stress and coping. *Review of General Psychology, 1*(2), 115-144.

Paunesku, D., Walton, G.M., Romero, C., Smith, E.N., Yeager, D.S., & Dweck, C.S. (2015). Mind-set interventions are a scalable treatment for academic achievement. *Psychological Science, 26*(6), 784-793

Pelletier, L.G., Fortier, M.S., Vallerand, R.J. & Brière, N.M. (2001). Associations among perceived autonomy support, forms of self-regulation and persistence: A prospective study. *Motivation and Emotion, 25(4*), 279–298.

Pelletier, L.G., Tuson, K.M., Haddad, N.K. (1997). Client motivation for therapy scale: a measure of intrinsic motivation, extrinsic motivation and amotivation for therapy. *Journal of Personality Assessment, 68*(2), 414-435.

Pesch, K. M., Larson, L. M., & Surapaneni, S. (2016). Parental autonomy support and career well-being: mediating effects of perceived academic competence and volitional autonomy. *Journal of Career Assessment, 24*(3), 497-512.

Phasa, T.N. (2010). Educational resilience among African survivors of child sexual abuse in South Africa. *Journal of Black Studies, 40*(6), 1234-1253.

Piaget, J. (1964). Part 1: cognitive development in children: Piaget development and learning. *Journal of Research in Science Teaching, 2*(3), 176-186.

Pietersen, I., Louw, J. & Dumont, K. (2009). Adjustment to university and academic performance among disadvantaged students in South Africa. *Educational Psychology, 29*(1), 99–115.

Pietersen, J. & Maree, K. (2007). Statistical analysis II: Inferential statistics. In K. Maree, (Ed). *First Steps in Research* pp. 198–213. Pretoria: Van Schaik.

Pigott, T.D. (2001). A review for methods for missing data. *Educational Research and Evaluation: An International Journal on Theory and Practice*, *7*(4), 353–383.

Pintrich, P. R., & Schunk, D. H. (2002). *Motivation in Education: Theory, Research, and Applications.* 2nd ed. New Jersey, NJ: Prentice Hall.

Pintrich, P.R. (2003). A motivational science perspective on the role of student motivation in learning and teaching contexts. *Journal of Educational Psychology, 95*(4), 667-686.

Pizzolato, J.E. (2006). Achieving college student possible selves: navigating the space between commitment and achievement of long-term identity goals. *Cultural Diversity & Ethnic Minority Psychology,* 12(1), 57-69.

Powers, W.T. (1973). Feedback: beyond behaviourism. *Science, 179*, 351-356.

Preacher, K.J. & Hayes, A.E. (2008). Asymptotic and resampling strategies for assessing and comparing indirect effects in multiple mediator models. *Bivariate Research Methods, 40*(3), 879–801.

Prinsloo, C. & Reddy, V. (2010). Educator leave in the South African public schooling system (HSRC policy brief). Pretoria: HRSC Press.

Prymachuck, S. & Richards, D.A. (2007). Look before you leap and don't put all your eggs in one basket: the need for caution and prudence in quantitative data analysis. *Journal of Research in Nursing*, *12* (43), 43–54.

Qualter, P., Gardner, K.J., Pope, D.J., Hutchinson, J.M. & Whiteley, H.E. (2012). Ability emotional intelligence, trait emotional intelligence and academic success in British secondary schools: A 5-year longitudinal study. *Learning and Individual Differences. 22*, 83–91.

Ratelle, C. F., & Duchesne, S. (2014). Trajectories of psychological need satisfaction from early to late adolescence as a predictor of adjustment in school. Contemporary Educational Psychology, 39(4), 388-400.

Ratelle, C., & Duchesne, S. (2014). Trajectories of psychological need satisfaction from early to late adolescence as a predictor of adjustment in school. *Contemporary Educational Psychology, 39,* 388-400.

Ratelle, C.F., Guay, F., Vallerand, R.J., Lacrose, S. & Senecal, C. (2007). Autonomous, controlled and amotivated types of academic motivation: A person-orientated analysis. *Journal of Educational Psychology, 99*(4), 734–746.

Rattansi, A. & Phoenix, A. (2005). Rethinking youth identities: Modernist and postmodern frameworks. *Identity and International Journal of Theory and Research, 5*(2), 97–123.

Raykov, T. & Marcoulides, G.A. (2006). *A First Course in Structural Equation Modelling.* 2nd ed. Mahwah, NJ: Lawrence Erlbaum & Associates.

Reddy, V. (2006). *Mathematics and Science Achievement at South African Schools in TIMSS 2003*. Cape Town: HSRC Press.

Reeve, J. (2006). Teachers as facilitators: what autonomy-supportive teachers do and why their students benefit. *Elementary School Journal, 106*, 225-236.

Reeve, J. (2012). A Self-determination Theory Perspective on Student Engagement. In S.L. Histenson, A.L. Rechly & C. Wylie (Eds.). *Handbook of Research on Student Engagement* pp 149–175. New York, NY: Springer.

Reeve, J., Jang, H., Harde, P., & Omura, M. (2002). Providing a rationale in an autonomy supportive way as a strategy to motivate others during an uninteresting activity. *Motivation and Emotion, 26,* 183-207.

Reis, H.T. & Judd, C.M. (2014). *Handbook of Research Methods in Social and Personality Psychology*. London: Cambridge University Press.

Reker, G.T., & Wong, P.T.P. (1988). Aging as an individual process: toward a theory of personal meaning. In J.B. Biren., & V.L., Bengston (Eds.), *Emerging Theories of Aging,* (pp 214-246). New York: Springer Publishing co.

Reker, G.T., & Wong, P.T.P. (2012). Personal meaning in life and psychosocial adaptation in the later years. In P.T.P. Wong (Ed.), *The Human Quest for Meaning: Theories, Research and application,* (pp 433-456). New York: Routledge Publishers.

Renaud-Dubé, A., Guay, F., Talbot, D., Taylor, G., & Koestner, R. (2015). The relations between implicit intelligence beliefs, autonomous academic motivation, and school persistence intentions: a mediation model. *Social Psychology Education, 18,* 255-272.

Renninger, K.A., & Hidi, S. (2016). *The power of interest for motivation and learning*. New York: Routledge.

Republic of South Africa. (2010*). Millennium Development Goals: Country Report*. Pretoria: Stats South Africa.

Republic of South Africa. (2014). *Budget 2015 People's Guide.* Pretoria: National Treasury.

Reyes, M.R., Brackett, M.A., Rivers, S.E., White, M. & Salovey, P. (2012). Classroom emotional climate, student engagement and academic achievement. *Journal of Educational Psychology, 104*(3), 700–712.

Reyneke, M., Meyer, L. & Nel, C. (2010). School-based assessment: the leash needed to keep the poetic 'unruly pack of hounds' effectively in the hunt for learning outcomes. *South African Journal of Education*, *30*(2), 8–22.

Roeser, R.W. & Peck, S.C. (2009). An education in awareness, self-motivation and self-regulated learning in contemplative perspective. *Educational Psychologist, 44*(2), 119–136.

Roeser, R.W., Peck, S.C., & Nasir, N.S. (2006). Self and identity processes in school motivation, learning and achievement. In P.A. Alexander., P.R. Pintrich & P.H. Winne (Eds.), *Handbook of Educational Psychology 2nd ed,* (pp.391-424). New Jersey: Erlbaum.

Roman, N.V. (2011). Maternal parenting in single and two-parent families in South Africa from a child's perspective. *Social Behaviour and Personality, 39*(5), 577-586.

Roman, N.V., Davids, E.L., Moyo, A., Schilder, L., Lacante, M. & Lens, W. (2015). Parenting styles and psychological needs influences on adolescent life goals and aspirations in a South African setting. *Journal of Psychology in Africa*, *25*(4), 305–312.

Roth, G., Kanat-Maymon, Y., & Bibi, U. (2011). Prevention of school bullying: the important role of autonomy supportive teaching and internalization of pro-social values. *British Journal of Educational Psychology, 81*, 65-666.

Rusbult, C.E. (1980). Commitment and satisfaction in romantic associations: a test of the investment model. *Journal of Experimental Social Psychology, 16,* 172–186.

Rusbult, C.E., Martz, J.M. & Agnew, C.R. (1998). The investment model scale: measuring commitment level, satisfaction level, quality of alternatives and investment size. *Personal Relationships, 5,* 357–391.

Ruvolo, A.P., & Markus, H.R. (1992). Possible selves and performance: the power of self-relevant imagery. *Social cognition, 10*(1), 95—124

Ryan, R.M. & Connell. (1989). Perceived locus of causality and internalisation: examining reasons for acting in two domains. *Journal of Personality and Social Psychology, 57*(5), 749–761.

Ryan, R.M. & Deci, E.L. (2006). Self-regulation and the problem of human autonomy: Does psychology need choice, self-determination and will? *Journal of Personality, 74*(6), 1557–1581.

Ryan, R.M., & Brown, K.W. (2003). Why we don't need self-esteem: on fundamental needs, contingent love, and mindfulness. *Psychological Inquiry, 14*(1), 27-82.

Ryan, R.M., & Deci, E.L. (2011). Multiple identities within a single self: a self-determination theory perspective on internalization within contexts and cultures In M.R., Leary., & J.P. Tangney (Eds.), *Handbook of Self and Identity 3rd ed*, (pp 253-274). New York: The Guilford Press.

Ryan, R.M., Huta, V., & Deci, E.L. (2008). Living well: a self-determination theory perspective on eudaimonia. *Journal of Happiness Studies*, 9, 139-170.

Ryan, R.M., Lynch, M.F., Vansteenkiste, M., & Deci, E.L. (2011). Motivation and autonomy in counselling, psychotherapy, and behavioural change: a look at theory and practice. *The Counselling Psychologist, 39*, 193-260.

Ryan, R.M., Patrick, H., Deci, E.L. & Williams, C. (2008). Facilitating health behavior change and its maintenance: interventions based on self-determination theory. *European Health Psychologist, 10,* 2–18.

Ryan, R.M., Stiller, J.D. & Lynch, J.H. (1994). Representations of relationships to teachers, parents and friends as predictors of academic motivation and self-esteem. *Journal of Early Adolescence, 14*(2), 226–249.

Ryff, C.D. (1989). Happiness is everything, or is it? Explorations on the meaning of psychological well-being. *Journal of Personality and Social Psychology, 57*(6), 1069-1081.

Sapmaz, F., Doğan, T., Sapmaz, S., Temizel, S. & Tel, F.D. (2012). Examining predictive role of psychological need satisfaction on happiness in terms of self-determination theory. *Social and Behavioural Sciences*, *55*, 861–868.

Savickas, M.L. (1991). The meaning of work and love: career issues and interventions. *The Career Development Quarterly, 39*(4), 315-324.

Scheier, M.F., Wrosch, C., Baum, A., Cohen, S., Martire, L.M., Matthews, K.A., Schultz, R., & Zdaniuk, B. (2006). The life engagement test: assessing purpose in life. *Journal of Behavioural Medicine, 29*(3), 291-298.

Schlechty, P. (1994). *Increasing Student Engagement.* Missouri Leadership Academy.

Schlomer, G.L, Bauman, S. & Card, N.A. (2010). Best practices for missing data management in counselling psychology. *Journal of Counselling Psychology*, *57*(1), 1–10.

Schnell, T. (2009). The sources of meaning in life questionnaire (SoMe): relations to demographics and well-being. *The Journal of Positive Psychology, 4*(6), 483-499.

Schuck, D.H. & Zimmerman, B.J. (1998). *Self-Regulated Learning: From Teaching to Self-Reflective Practice.* New York, NY: Guildford Press.

Schüler J, Wegner M, & Knechtle B. (2014). Implicit motives and basic need satisfaction in extreme endurance sports. *Journal of Sport & Exercise Psychology, 36*(3), 293-302.

Schüler, J., & Brandstätter, V. (2013). How basic need satisfaction and dispositional motives interact in predicting flow experience in sport, Journal of Applied Social Psychology, 43(4), 689-705.

Schüler, J., Brandstätter, V., & Sheldon, K. M. (2013). Do implicit motives and basic psychological needs interact to predict well-being and flow? Testing a universal hypothesis and a matching hypothesis. *Motivation And Emotion, 37*(3), 480-495.

Schüler, J., Sheldon, K.M., & Frölich, S.M. (2010). Implicit need for achievement moderates the relationship between felt competence and subsequent motivation. *Journal of Research in Personality, 44*, 1-12.

Schumacker, R.E. & Lomax, R.G. (2012). *A Beginner's Guide to Structural Equation Modelling.* New York, NY: Routledge.

Schunk, D.H. (1995). Self-efficacy and education and instruction. In J.E. Maddux (Ed.), *Self-efficacy, Adaptation, and Adjustment: Theory, Research and Application*, (pp 238-244), New York: Plenum Press.

Schunk, D.H. (2001). Social cognitive learning theory and self-regulated learning. In B.J. Zimmerman & D.H. Schunk (Eds.). *Self-regulated Learning and Academic Achievement: Theoretical Perspectives 2nd ed,* (pp 125-151). New Jersey: Erlbaum.

Schwartz, S.J., Kilmstra, T.A., Luyckx, K., Hale, W.W., Frijns, T., Oosterwegel, A., Van Lier, P.A.C., Koot, H.M. & Meeus, W.H.J. (2010). Daily dynamics of personal identity and self-concept clarity. *European Journal of Personality, 25*(5), 373–385.

Schwartz, S.J., Mullis, R.L., Waterman, A.S., & Dunham, R.M. (2000). Ego identity status, identity style, and personal expressiveness: an empirical investigation of three convergent constructs. *Journal of Adolescent Research, 15*(4), 504-521.

Self-Regulation Questionnaires. (n.d.). Retrieved March 17, 2017, from http://selfdeterminationtheory.org/self-regulation-questionnaires/

Senecal, C., Vallerand, R.J., & Guay, F. (2001). Antecedents and outcomes of work-family conflict: toward a motivational model: *Personality and Social Psychology Bulletin, 27*, 179-186.

Shavelson, R.J., & Marsh, H.W. (1986). On the structure of the self-concept. In R. Schwarzer (Ed.), *Anxiety and Cognitions.* New Jersey: Lawrence Erlbaum.

Sheldon KM, & Schüler J. (2011). Wanting, having, and needing: integrating motive disposition theory and self-determination theory. *Journal of Personality And Social Psychology, 101*(5), 1106-23.

Sheldon, K.M. & Houser- Marko, L. (2001). Self-concordance, goal attainment and the pursuit of happiness: Can there be an upward spiral? *Journal of Personality and Social Psychology*, *80*(1), 152–165.

Sheldon, K.M. & Kasser, T. (1995). Coherence and congruence: Two aspects of personality integration. *Journal of Personality and Social Psychology, 68*(3), 531–543.

Sheldon, K.M. (2002). The self-concordance model of healthy goal-striving: when personal goals correctly represent the person. In E.L. Deci., & R.M. Ryan (Eds.), *Handbook of Self-Determination Research*, (pp 65-86), New York: University of Rochester Press.

Sheldon, K.M. (2009). Providing the scientific backbone for positive psychology: a multi-level conception of human thriving. *Psychological Topics, 2*, 267-284.

Sheldon, K.M. (2014). Becoming oneself: the central role of self-concordant goal selection. *Personality and Social Psychology Review, 18*(4), 349-365.

Sheldon, K.M., & Elliot, A.J. (1999). Goal striving, need satisfaction, and longitudinal well-being: the self-concordance model. *Journal of Personality and Social Psychology, 76*(3), 482-497.

Sheldon, K.M., & Niemiec, C.P. (2006). It's not just the amount that counts: balanced need satisfaction also affects well-being. *Journal of Personality and Social Psychology, 91*(2), 331-341.

Sheldon, K.M., Cheng, C., & Hilpert, J. (2011). Understanding well-being and optimal functioning: applying the multilevel personality in context (MPIC) model. *Psychological Inquiry, 22*, 1-16.

Sheldon, K.M., Elliot, A.J., Kim, Y., & Kasser, T. (2001). What is satisfying about satisfying events? Testing 10 candidate psychological needs. *Journal of Personality and Social Psychology, 80*(2), 325-339.

Sheldon, K.M., Elliot, A.J., Ryan, R.M., Chirkov, V., Kim, Y., Wu, C., Demir, M., & Sun, Z. (2004). Self-concordance and subjective well-being in four cultures. *Journal of Cross Cultural Psychology, 35(*2), 209-223.

Sheldon, K.M., Kasser, T., Smith, K., & Share, T. (2002). Personal goals and psychological growth: testing an intervention to enhance goal attainment and personality integration. *Journal of Personality, 70*(1), 5-31.

Sheldon, K.M., Osin, E.N., Gordeeva, T.O., Suchkov, D.D., Bobrov, V.V., Rasskazova, E.I., & Sychev, O.A. (2015). *Evaluating the Dimensionality of the Relative Autonomy Continuum in US and Russian Samples (Working paper BRP 48/PSY/2015*). National Research University Higher School of Economics.

Sheldon, K.M., Prentice,M., Halusic, M.,& Schüler. (2015). Matches between assigned goal-types and both implicit and explicit motive dispositions predict goal self-concordance. *Motivation and Emotion, 39*, 335-343.

Sheldon, K.M., Ryan, R.M., Deci, E.L., & Kasser, T. (2004). The independent effects of goal contents and motives on well-being: it's both what you pursue and why you pursue it. *Personality and Social Psychology Bulletin, 30*, 475-486.

Sherman, A.C., & Simonton, S. (2012). Effects of personal meaning among patients in primary and specialized care: association with psychosocial and physical outcomes. *Psychology and Health, 27*. 475-490.

Shiefele, U., Krapp, A., & Winteler, A. (1992). Interest as predictor of academic achievment: a meta-analysis of research. In K.A. Renninger, S. Hidi., & A Krapp (Eds.). *The role of interest in learning and development*, (pp. 183-212). New York: Erlbaum.

Shrout, P.E., & Bolger, N. (2002). Mediation in experimental and nonexperimental studies: new procedures and recommendations. *Psychological Methods, 7*(4), 422-445.

Sica, L.S., Crocetti, E., Ragozini, G., Sestito, L.A., & Serafini, T. (2016). Future-oriented or present-focused? The role of social support and identity styles on 'futuring' in Italian late adolescents and emerging adults. *Journal of Youth Studies, 19*(2), 183-203.

Sierens, E., Vansteenkiste, M., Goossens, L., Soenens, B. & Dochy, F. (2009). The synergistic relationship of perceived autonomy support and structure in the prediction of self-regulated learning. *British Journal of Educational Psychology, 79*, 57–68.

Singh, P., Mbokodi, S.M. & Msila, V.T. (2004). Black parental involvement in education. *South African Journal of Education*, *24*(4), 301–307.

Sirin, S.R. (2005). Socioeconomic status and academic achievement: A meta-analytic review of research. *Review of Educational Research, 75,* 417–453.

Skinner, A.E., & Chi, U. (2011). Intrinsic motivation and engagement as active ingredients in garden-based education: examining models and measures derived from self-determination theory. *The Journal of Environmental Education, 43*(1), 16-36.

Skinner, B.F. (1974). *About Behaviourism.* New York, NY: Vintage.

Skowron, E.A., & Friedlander, M.L. (1998). The differentiation of self inventory: development and initial validation. *Journal of Counselling Psychology, 45*(3), 235-245.

Skowron, E.A., Wester, S.R., & Azen, R. (2004). Differentiation of self mediates college stress and adjustment, *Journal of Counselling and Development, 82*, 69-82.

Smith, A., Ntoumanis, N. & Duda, J.L. (2007). Goal attainment and wellbeing: adapting and testing the self-concordance model in sport. *Journal of Sport and Exercise Psychology, 29*(6), 763–782.

Smits, I., Soenens, B., Vansteenkiste, M., Luyckx, K., & Goossens, L. (2010). Why do adolescents gather information or stick to parental norms? Examining autonomous and controlled motives behind adolescents' identity style. *Journal of Youth and Adolescence, 39*, 1343-1356.

Soenens, B. & Vansteenkiste, M. (2005). Antecedents and outcomes of self-determination in 3 life domains: the role of parents' and teachers' autonomy support. *Journal of Youth and Adolescence, 34*(6), 589–604.

Soenens, B. & Vansteenkiste, M. (2011). When is identity congruent with the self? A Self-determination Theory perspective. In S. J. Schwartz, K. Luyckx & V.L. Vignoles (Eds). *Handbook of Identity Theory and Research* pp. 381–404. New York, NY: Springer.

Soenens, B., Berzonsky, M.D., Dunkel, C.S., Papini, D.R. & Vansteenkiste, M. (2011). Are all identity commitments created equally? The importance of motives for commitment for late adolescents' personal adjustment. *International Journal of Behavioural Development. 35*(4), 358–369.

Soenens, B., Berzonsky, M.D., Vansteenkiste, M., Beyers, W., & Goosens, L. (2005). Identity styles and causality orientations: in search of the motivational underpinnings of the identity exploration process. *European Journal of Personality, 19*, 427-442.

Sommer, K.L., Baumeister, R.F., & Stillman, T.F. (2012). The construction of meaning from life events: empirical studies of personal narratives. In P.T.P. Wong (Ed.), *The Human Quest for Meaning: Theories, Research and application,* (pp 297-314). New York: Routledge Publishers.

Sonnetag, T.L. & Barnett, M.A. (2011). Emotional Self-Regulation. In S. Goldstein & J.A. Nagheri (Eds.). *Encyclopaedia of Child Behaviour and Development*. New York, NY: Springer.

Spaull, N. (2011). *A Preliminary Analysis of SACMEQ III South Africa (Working Paper 11/11).* University of Stellenbosch: Bureau for Economic Research.

Spaull, N. (2012). *Poverty & Privilege: Primary School Inequality in South Africa (Working Paper 13/12).* University of Stellenbosch: Bureau for Economic Research.

Spaull, N. (2013). *South Africa's Education Crisis: The Quality of Education in South Africa 1994–2011*. Johannesburg: Centre for Development & Enterprise.

Sperber, A.D. (2004). Translation and validation of study instruments for cross-cultural research. *Gastroenterology*, *126*, 143–156.

Standage, M., Duda, J.L.,& Ntoumanis, N. (2005). A test of self-determination theory in school physical education. *British Journal of Educational Psychology, 75*, 411-433.

Stankov, L., Lee, J., Luo, W., & Hogan, D.J. (2012). Confidence: a better predictor of academic achievemtn than self-efficacy, self-concept and anxiety? Learning and Individual Differences, 22, 747

Statistics South Africa (2012). *Census 2011 Statistical Release*. Pretoria: Statistics South Africa.

Steele, C.M. (1997). A threat in the air: how stereotypes shape intellectual identity and performance. *American Psychologist, 25*(2), 613-629.

Steele, J.P. & Fullagar, J.C. (2009). Facilitators and outcomes of student engagement in a college setting. *Journal of Psychology: Interdisciplinary and Applied*, *143*(1), 5–27.

Steers, R.M., Mowday, R.T., & Shapiro, D.L. (2004). The future of work motivation theory. *Academy of Management Review, 29*(3), 379-389.

Steger, M.F. (2009). Meaning in Life. In S.J. Lopez., & C.R. Snyder (Eds.), *The Oxford Handbook of Positive Psychology (2nd ed*), (pp 679-687). New York: Oxford University Press.

Steger, M.F. (2012). Making meaning in life. *Psychological Inquiry, 23*, 381-385

Steger, M.F., & Frazier, P., Oishi, S., & Kaler, M. (2006). The meaning in life questionnaire: assessing the presence of and search for meaning in life. *Journal of Counselling Psychology, 53*(1), 80-93.

Steger, M.F., & Kashdan, T.B. (2013). The unbearable lightness of meaning: well-being and unstable meaning in life. *The Journal of Positive Psychology: Dedicated to Furthering Research and Promoting Good Practice, 8*(2), 1-13.

Stevens, J. (2002). *Applied Multivariate Statistics for the Social Sciences 4th ed*. New Jersey: Lawrence Erlbaum Associates.

Stevens, R. (2008). *Erik H Erikson: Explorer of Identity and the Life Cycle.* Basingstoke: Palgrave Macmillan.

Struwig, F. W. & Stead, G. B. (2001). *Planning, designing and reporting research.* Cape Town: Pearson Education.

Strydom, M.A.A., Pretorius, P.J. & Joubert, G. (2012). Depression and anxiety among Gr 11 and Gr 12 learners attending schools in central Bloemfontein. *South African Journal of Psychiatry*, *18*(3), 54–68.

Stryker, S. & Burke, P.J. (2000). The past, present and future of identity theory. *Social Psychology Quarterly*, *63*(4), 284–297.

Stryker, S. & Serpe, R.T. (1982). Commitment, identity salience and role behaviour: Theory and research examples. In I. Wickers (Ed.) *Personality, Roles and Social Behaviour* pp 345–382. New York, NY: Springer.

Suh, E.M. (2002). Culture, identity consistency, and subjective well-being. *Journal of Personality and Social Psychology,* 83(6), 1378-1391.

Sullivan, M. (2008). *Fundamentals of Statistics.* 2nd ed. London: Prentice Hall.

Suresh, K.P. & Chandrahekara, S. (2012). Sample size estimation and power analysis for clinical research studies. *Journal of Human Reproductive Sciences*, *5*(1), 7–13.

Swann, W.B. (2012). Self-verification theory. In P.A.M. Van Lange, A.W. Kruglanski & E.T. Higgins (Eds.). *Handbook of Theories of Social Psychology* pp 24–42. London: Sage.

Tavakol, M. & Dennick, R. (2011). Making sense of Cronbach's alpha. *International Journal of Medical Education, 2*(53), 53–55.

Taylor, G., Jungert, T., Mageau, G.A., Schattke, K., Dedic, H., Rosenfield, S. & Koestner, R. (2014). A self-determination theory approach to predicting school achievement over time: The unique role of intrinsic motivation. *Contemporary Educational Psychology, 39*, 342–358.

Taylor, N. (2008). *What's wrong with South African Schools*. Presentation to the What's Working in School Development conference, Pretoria, 28-29 February, 2008.

Taylor, S. & Coetzee, M. (2013). *Estimating the impact of language instruction in South African primary schools: A fixed effects approach. (Working Paper 21/13).* University of Stellenbosch: Bureau for Economic Research.

Teixeira, P.J., Carraça, E.V., Markland, D., Silva, M.N., & Ryan, R.M. (2012). Exercise, physical activity and self-determination theory: a systematic review. *International Journal of Nutrition and Physical Activity, 22*(9), 72-91.

Terre Blanche, M., Durheim, K. & Painter, D. (2006). *Research in Practice*. 2nd ed. Cape Town: UCT Printers.

Thekiso, S.M., Botha, K.F.H, Wissing, M.P. & Kruger, A. (2013). Psychological well-being, physical health and the quality of life of a group of farm workers in South Africa: The FLAGH study. In M.P. Wissing (Ed.). *Well-Being Research in South Africa* pp 293–313. New York, NY: Springer.

Theron, L.C. & Theron, A.M.C. (2014). Education services and resilience processes: Resilient black South African students' experiences. *Children and Youth Services Review, 47*, 297–306.

Thompson, N.J., Coker, J., Krause, J.S., & Else, H. (2003). Purpose in life as mediator of adjustment after spinal cord injury, *Rehabilitation Psychology, 48*(2), 100-108.

Thuen, E., & Bru, E. (2000). Learning environment, meaningfulness of schoolwork and on-task-orientation among Norwegian 9th grade students. *School Psychology International, 21*(4), 393-413.

Tian, L., Chen, H., & Huebner, S. (2014). The longitudinal relationship between basic psychological needs satisfaction at school and school related subjective well-being in adolescents. *Social Indicators Research*, 119, 353-372.

Tinsley, H.E.A., & Brown, S.D. (2000). *Handbook of Applied Multivariate Statistics and Mathematical Modelling.* San Diego: Academic Press.

Tsai,Y., Kunter, M., Lüdtke O., Trautwein, U., & Ryan, R.M. (2008). What makes lessons interesting? The role of situational and individual factors in three school subjects. *Journal of Educational Psychology, 100*(2), 460-472.

Unger, D.G., Brown, M.B., Tressell, P.A., & McLeod, L.E. (2000). Interparental conflict and adolescent mood: the role of family functioning. *Child Psychiatry Human Development, 31*(1), 23-41.

UNICEF (2012). *Children with Disabilities in South Africa: A Situation Analysis 2001–2011*. Pretoria.

UNICEF (2013). *Children's Rights to an Adequate Standard of Living*. Pretoria.

Valentine, J.C., DuBois, D.L., & Cooper, H. (2004). The relation between self-beliefs and academic achievement: a meta-analytical review. *Educational Psychologist, 39*, 111-133.

Vallacher, R.R. & Wegner, D.M. (1989). Levels of personal agency: Individual variation in action identification. *Journal of Personality and Social Psychology, 57*(4), 660–671.

Vallerand, R.J. & Ratelle, C.F. (2002). Intrinsic and extrinsic motivation: A hierarchical model. In E.L. Deci & R.M. Ryan, *Handbook of Self Determination Research* pp 37–58. New York, NY: University of Rochester Press.

Vallerand, R.J. (1997). Toward a hierarchical model of intrinsic and extrinsic motivation. In M. Zanna, *Advances in experimental social psychology,* (pp 271-360). New York: Academic Press.

Vallerand, R.J. (2000). Deci and Ryan's self-determination theory: A view from the hierarchical model of intrinsic and extrinsic motivation. *Psychological Inquiry, 11*(4), 312–318.

Vallerand, R.J., Fortier, M.S. & Guay, F. (1997). Self-determination and persistence in a real life setting: Toward a motivational model of high school dropout. *Journal of Personality and Social Psychology*, *72*(5), 1161–1176.

Van den Berg, S. (2008). How effective are poor schools? poverty and educational outcomes in South Africa. *Studies in Educational Evaluation, 34*, 145-154.

Van den Broeck, A., Vansteenkiste, M., & De Witte, H. (2008). Explaining the relationship between job characteristics, burnout and engagement: the role of basic psychological need satisfaction. *Work and Stress, 22*, 277-294.

Van Ree, E. (2011). *HIV/AIDS Preventative Self-Efficacy and Self-Determination Effect on Risky Sexual Behaviour of South-African Adolescents*. Unpublished master's dissertation. The Netherlands: Utrecht University.

Vansteenkiste, M. & Ryan, R.M. (2012). On psychological growth and vulnerability: Basic psychological need satisfaction and need frustration as a unifying principle. *Journal of Psychotherapy Integration, 23*(3), 263–280.

Vansteenkiste, M., Lens, W., De Witte, H., & Feather, N.T. (2005). Understanding unemployed people's job search behaviour, unemployment experience and well-being: a comparison of expectancy-value theory and self-determination theory. *British Journal of Social Psychology, 44*, 269-287.

Vansteenkiste, M., Lens, W., De Witte, S., De Witte, H.,& Deci, E.L. (2004). The 'why' and 'why not' of job search behaviour: their relation to searching unemployment experience and well-being. *European Journal of Social Psychology, 34*, 345-363.

Vansteenkiste, M., Niemiec, C.P. & Soenens, B. (2010). The development of the five mini-theories of self-determination theory: An historical overview, emerging trends and future directions. *The Decade Ahead: Theoretical Perspectives on Motivation and Achievement, 16*, 105–165.

Vansteenkiste, M., Sierens, E., Goossens, L., Soenens, L., Dochy, F., Mouratidis, A., Aelterman, N., Haerens, L. & Beyers, W. (2012). Identifying configurations of perceived teacher autonomy support and structure: Associations with self-regulated learning, motivation and problem behaviour. *Learning and Instruction, 22,* 431–439.

Vansteenkiste, M., Simons, J., Lens, W., Soenens, B., & Matos, L. (2005). Examining the motivational impact of intrinsic versus extrinsic goal framing and autonomy-supportive versus internally controlling communication style on early adolescents' academic achievement. *Child Development, 2*, 483-501.

Vansteenkiste, M., Zhou, M., Lens, W., & Soenens, B. (2005). Experiences of autonomy and control among Chinese learners: vitalizing or immobilizing. *Journal of Educational Psychology, 97*(3), 468-483.

Vasalampi, K., Salmela-Aro, K., & Nurmi, J. (2009). Adolescents' self-concordance, school engagement, and burnout predict their educational trajectories. *European Psychologist, 14*(4), 124-145.

Vierling, K. K., Standage, M., & Treasure, D. C. (2007). Predicting attitudes and physical activity in an "at-risk" minority youth sample: a test of self-determination theory. *Psychology Of Sport & Exercise, 8*(5), 795-817.

Vignoles, V.L., Schwartz, S.J. & Luyckx, K. (2011). Introduction: towards an integrated view of identity. In S.J. Schwartz, K. Luyckx & V.L. Vignoles (Eds). *Handbook of Identity Theory and Research* pp. 1–27. New York, NY: Springer.

Visser, M., Juan, A. & Feza, N. (2015). Home and school resources as predictors of academic performance in South Africa. *South African Journal of Education*, *35*(1), 1–10.

Vogel, F.R., & Human-Vogel, S. (2016). Academic commitment and self-efficacy as predictors of academic achievement in additional materials science. *Higher Education Research and Development,* 35(6), 1298-1310.

Vroom, V.H. (1964). *Work and Motivation*. New York: Wiley.

Vygotsky, L. S. (1978). *Mind in Society: The Development of Higher Psychological processes*. Cambridge, MA: Harvard University Press.

Walsh, S.M. & Hardin, S.B. (1994). An art future image intervention to enhance identity and self-efficacy in adolescents. *Journal of Child and Adolescent Psychiatric Nursing, 7*(3), 24–34.

Waterman, A.S. (1990). Personal expressiveness: philosophical and psychological foundations. *The Journal of Mind and Behaviour, 11*(1), 47-74.

Waterman, A.S. (1993). Two conceptions of happiness: contrasts of personal expressiveness (eudaimonia) and hedonic enjoyment. *Journal of Personality and Social Psychology, 64*(4), 678-678.

Waterman, A.S. (2011). Eudemonic identity theory: identity as self-discovery. In S.J. Schwartz, K. Luyckx, & V.L. Vignoles (Eds). *Handbook of Identity Theory and Research* pp. 357–379. New York, NY: Springer.

Wayne, T. & Collier, V.P. (2002). *A National Study of School Effectiveness for Language Minority Students' Long-Term Academic Achievement*. Centre for Education, Diversity and Excellence. Santa Cruz, CA: University of California.

Wehman-Josefsson, K. Lindwall. M. & Ivarsson, A. (2015). Need satisfaction, motivational regulations and exercise: Moderation and mediation effects. *Physical Activity*, *12*, 67–85.

Weiner, B. (1986). *An Attributional Theory of Motivation and Emotion*. New York: Springer.

Weiner, B. (1992). *Human Motivation: Metaphors, Theories and Research*. Newbury Park: Sage.

Weinstein N., Przybylski A.K., & Ryan R.M. (2013). The integrative process: new research and future directions. *Current Directions in Psychological Science, 22*(1), 69-74.

Weinstein, N., Deci, E.L., & Ryan, R.M. (2011). Motivational determinants of integrating positive and negative past identities. *Journal of Personality and Social Psychology, 100*(3), 527-544.

Weinstein, N., Przybylski, A.K., & Ryan, R.M. (2012). The index of autonomous functioning: development of a scale of human autonomy. *Journal of Research in Personality, 46*, 397-413.

Weinstein, N., Ryan, R.M., & Deci, E.L. (2012). Motivation, meaning and wellness: a self-determination perspective on the creation and internalization of personal meanings and life goals. In P.T.P. Wong (Ed.), *The Human Quest for Meaning: Theories, Research and application,* (pp 81-106). New York: Routledge Publishers.

Whitley, B.E. (2001). *Principles of Research in Behavioural Science*. 2nd ed. Boston: McGraw-Hill.

Wigfield, A. (1994). Expectancy-value theory of achievement motivation: a developmental perspective. *Educational Psychology Review, 6*, 49-78.

Williams, B., Onsman, A., & Brown, T. Exploratory factor analysis: a five-step guide for novices. *Journal of Emergency Primary Health Care, 8*(3), 1-13.

Williams, G.C., & Deci, E.L. (1996). Internalisation of biosphychosocial values by medicine students: a test of self-determination theory. *Journal of Personality and Social Psychology, 70(*4), 767–779.

Williams, G.C., Cox, E.M., Kouides, R. & Deci, E.L. (1999). Presenting the facts about smoking to adolescents. *Paediatric Adolescent Medicine*, *153*, 959–982.

Williams, G.C., Freedman, Z. R. & Deci, E.L. (1998). Supporting autonomy to motivate patients with diabetes for glucose control. *Diabetes Care, 21*(10), 1644–1651.

Williams, G.C., Grow, V. M., Freedman, Z., Ryan, R. M. & Deci, E. L. (1996). Motivational predictors of weight loss and weight-loss maintenance. *Journal of Personality and Social Psychology*, *70*, 115–126.

Williams, G.C., McGregor, H.A., King, D., Nelson, C.C. & Glasgow, R.E. (2005). Variation in perceived competence, glycemic control and patient satisfaction: relationship to autonomy support from physicians. *Patient Education and Counselling,* 57, 39–48.

Williams, G.C., McGregor, H.A., Sharp, D., Levesque, C., Kouides, R.W., Ryan, R.M. & Deci, E.L. (2006). Testing a self-determination theory intervention for motivating tobacco cessation: supporting autonomy and competence in a clinical trial. *Health Psychology, 25(*1), 91–101.

Wolf, S. (2010). *Meaning in Life and why it Matters*. New Jersey: Princeton University Press.

Wong, E., West, D. & Cusick, L. (2002). Perception of autonomy support, parent involvement, competence and self-worth as predictors of motivational orientation and academic achievement: an examination of sixth and ninth grade regular education students. *Adolescence*, *37*(146), 255–266.

Wong, M.M. (2000). The relationship between causality orientations, academic experience, academic performance and academic commitment. *Personality and Social Psychology, 26*(3), 315–326.

Wong, P.T.P. (2012). Toward a dual system model of what makes life worth living. In P.T.P. Wong (Ed.), *The Human Quest for Meaning: Theories, Research and application,* (pp 3-20). New York: Routledge Publishers.

Wood, D., Bruner, J. & Ross, G. (1976). The role of tutoring in problem solving. *Journal of Child Psychology and Child Psychiatry*, *17*, 89−100.

Worington, R.L., & Whittaker, T.A. (2006). Scale development research: a content analysis and recommendations for best practices. *The Counselling Psychologist, 34*(6), 806-835.

Wright, L.S., Frost, C.J., & Wisecarver, S,J. (1993). Church attendance, meaningfulness of religion, and depressive symptomatology among adolescents. *Journal of Youth and Adolescence, 22(*5), 559-568.

Wuisman, J.J.J.M. (2005). The logic of scientific discovery in critical realist social scientific research. *Journal of Critical Realism*, *4*(2), 366–394.

XE currency converter (2017). Retrieved from: http://www.xe.com/currencyconverter/convert/?Amount=1&From=USD&To=ZAR

Yarahmadi, Y. (2011). Students' school performance on the basis of explanation of internal motivational factors with structural functional model. *Contemporary Educational Research Journal, 01*, 1–10.

Young, A.G., & Pearce, S. (2013). A beginner's guide to factor analysis: focussing on exploratory factor analysis. *Tutorials in Quantitative Methods for Psychology, 9*(2), 79-94.

Zhao, X., Lynch, J.G. & Chen, Q. (2010). Reconsidering Baron and Kenny: Myths and truths about mediation analysis. *Journal of Consumer Research*, 37.

Zhou, M., Ma, W. J., & Deci, E. L. (2009). The importance of autonomy for rural Chinese children's motivation for learning. *Learning and Individual Differences*, *19*, 492–498.

Zhu, S., Tse, S., Cheung, S. H., & Oyserman, D. (2014). Will I get there? Effects of parental support on children's possible selves. *British Journal of Educational Psychology, 84*(3), 435-453.

Zulu, B.M., Urbani, G., Van der Merwe, A. & Van der Walt, J.L. (2004). Violence as an impediment to a culture of teaching and learning in some South African schools. *South African Journal of Education, 24*(2), 170–175.

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APPENDICES

Appendix 1
Ethical Clearance Certificate

APPENDIX 1 – ETHICAL CLEARANCE CERTIFICATE

UNIVERSITEIT VAN PRETORIA
UNIVERSITY OF PRETORIA
YUNIBESITHI YA PRETORIA

Faculty of Education
Fakulteit Opvoedkunde
Lefapha la Thuto

RESEARCH ETHICS COMMITTEE

CLEARANCE CERTIFICATE	**CLEARANCE NUMBER :** UP 11/05/07 HUMAN-VOGEL 13-002
DEGREE AND PROJECT	PhD The relation between academic commitment, self-determination and academic achievement in grade 11 and grade 12 learners.
INVESTIGATOR(S)	Jeanne Meiring
DEPARTMENT	Education Psychology
DATE PROTOCOL APPROVED	28 March 2014
DATE CLEARANCE ISSUED	30 October 2015

Please note:

For Masters applications, ethical clearance is valid for 2 years

For PhD applications, ethical clearance is valid for 3 years.

CHAIRPERSON OF ETHICS COMMITTEE: Prof Liesel Ebersöhn

DATE: 30 October 2015

CC: Jeannie Beukes
Liesel Ebersöhn
Prof S Human-Vogel
Dr C Niemiec

This ethical clearance certificate is issued subject to the condition that the approved protocol was implemented. The Ethics Committee of the Faculty of Education does not accept any liability for research misconduct, of whatsoever nature, committed by the researcher(s) in the implementation of the approved protocol.

Please quote the clearance number in all enquiries.

Appendix 2

Permission North West Education Department

APPENDIX 2 – PERMISSION NORTH WEST EDUCATION DEPARTMENT

education
Lefapha la Thuto la Bokone Bophirima
Noord-Wes Departement van Onderwys
North West Department of Education
NORTH WEST PROVINCE

6 Pendoring Street,
Brits, 0250
Private Bag X5082
Brits, 0250
Tel.: (012) 250-1910
Fax.: (012) 250-1904
e-mail: zboikhutso@nwpg.gov.za

OFFICE OF THE AREA MANAGER: MADIBENG AREA OFFICE

Enquiries : *Thema N.M*
Tel : *012 250 1911*
Email : *mosst@webmail.co.za*

To : All school

From : Thema N.M

Date : 29 January 2014

Subject : **DATA COLLECTION**

Cornè Jeanne Meiring is a candidate at the University of Pretoria and she is at a stage where they need to collect data. Her research topic is, to asses learners academic commitments and self-determination, in schools around Madibeng Area.

This communique serves to request the Principals of the affected Schools to allow her to gain entrance to the site and collect the needed data around Madibeng Area Schools and at no cost should the research temper with learners contact time in class.

Your assistance in this regard will be highly appreciated.

DEPARTMENT OF EDUCATION
MADIBENG AREA OFFICE
2014 -01- 29
PRIVATE BAG X5082, BRITS, 0250
TEL: 012 250 1910 FAX: 012 250 1904
NORTH WEST PROVINCE

Thema N.M
ACTING AREA MANAGER

Appendix 3
Questionnaire English

APPENDIX 3 – QUESTIONNAIRE ENGLISH

UNIVERSITEIT VAN PRETORIA
UNIVERSITY OF PRETORIA
YUNIBESITHI YA PRETORIA

Section A: Demographical information

Thank you for participating in this research. Please respond to all questions honestly. Please remember that your specific answers and name will be kept secret.

For office use only

1. Name and surname:…… V1
2. Name of the school you are attending:…… V2
3. How old are you:…….(to the closest year) ?
   V3
4. What average percentage academic mark to you expect to achieve at the end of the first term?:……
   V4
5. Gender (please indicate your gender with a cross, e.g. X): V5

Male	1	Female	2

6. In which grade are you? (please indicate with a cross, e.g. X):

Gr 12	2	Gr 11	1

V6

7. Please indicate which racial group you belong to? (please indicate with a cross, e.g. X): V7

Black	1
White	2
Coloured	3
Indian	4
Asian	5
Other	6

8. How many ***hours*** do you spend on school work ***per week?***: _____ hours V8
9. Please respond Yes or No to the following questions, by making a cross on the appropriate block:

Question:	**Yes (1)**	**No (2)**	
Are you receiving education in your home language?	Yes (1)	No (2)	V9
Do you have a specific future career in mind?	Yes (1)	No (2)	V10
Do you set learning goals for yourself?	Yes (1)	No (2)	V11

10. Please indicate how often the following factors has a negative influence on your academic performance:

	Never	Rarely	Every once in a while	Sometimes	Almost always	For office use	
Extramural activities (e.g. sport)	1	2	3	4	5	V12	
Time spent on either watching television, playing on laptop or/and cellphone	1	2	3	4	5	V13	
Socializing with friends	1	2	3	4	5	V14	
Lack of resources (e.g. not having books or electricity or transport)	1	2	3	4	5	V15	
Feeling that you do not have adequate study skills	1	2	3	4	5	V16	
Obligations at home (e.g. taking care of a sibling or a parent)	1	2	3	4	5	V17	
Not being interested in school work	1	2	3	4	5	V18	

11. Please indicate how often you receive support from the following people in order to achieve academic success:

	Never	Rarely	Every once in a while	Sometimes	Almost always	For office use	
Parents	1	2	3	4	5	V19	
Teachers	1	2	3	4	5	V20	
Friends	1	2	3	4	5	V21	
Siblings or other family members	1	2	3	4	5	V22	
Au pair or other individual taking care of you in the afternoon	1	2	3	4	5	V23	

Section B

Please read each item carefully, thinking about how it relates to your life, and then indicate how true it is for you, by marking the appropriate number next to the response

	Strongly disagree	Moderately disagree	Slightly disagree	Neutral	Slightly agree	Moderately agree	Strongly agree	*For office use*	
I feel that my teachers provide me with choices and options	1	2	3	4	5	6	7	V24	
I feel understood by my teachers	1	2	3	4	5	6	7	V25	
I am able to be open with my attitudes and feelings about my teachers	1	2	3	4	5	6	7	V26	
My teachers convey confidence in my abilities	1	2	3	4	5	6	7	V27	
I feel that my teachers accept me	1	2	3	4	5	6	7	V28	
My teachers are interested in how I understand my life	1	2	3	4	5	6	7	V29	
My teachers encourage me to ask questions when it is appropriate to do so	1	2	3	4	5	6	7	V30	
I feel a lot of trust in my teachers	1	2	3	4	5	6	7	V31	
My teachers answer my questions fully and carefully	1	2	3	4	5	6	7	V32	
My teachers listen to how I like to do things	1	2	3	4	5	6	7	V33	
My teachers handle my emotions very well.	1	2	3	4	5	6	7	V34	
I feel that my teachers care about me as a person.	1	2	3	4	5	6	7	V35	
I do not feel very good about the way my teachers communicate with me	1	2	3	4	5	6	7	V36	
My teachers try to understand how I see things	1	2	3	4	5	6	7	V37	
I feel able to share my feelings with my teachers	1	2	3	4	5	6	7	V38	

Section C

Please read each item carefully, thinking about how it relates to your life, and then indicate how true it is for you, by marking the appropriate number next to the response

	Strongly disagree	Moderately disagree	Slightly disagree	Neutral	Slightly agree	Moderately agree	Strongly agree	*For office use*	
Being a learner allows me to express myself completely.	1	2	3	4	5	6	7	V40	
My approach to my academic activities reflects who I am as a person.	1	2	3	4	5	6	7	V41	
My participation in academic activities contribute to shaping me as a person.	1	2	3	4	5	6	7	V42	
I am the kind of person who thrives on participating in academic activities.	1	2	3	4	5	6	7	V43	
Participating in academic activities is a central aspect of who I am.	1	2	3	4	5	6	7	V44	
Academic activities lends meaning to my life.	1	2	3	4	5	6	7	V45	
I express myself through my participation in academic activities.	1	2	3	4	5	6	7	V46	
Participating in academic activities is an important part of my life.	1	2	3	4	5	6	7	V47	

Section D

Please indicate the extent to which each reason is true for you, using the 7-point scale below.
I partake in academic activities in school (e.g. study for a test, participate in class or do assignments) in school because:

	Strongly disagree	Moderately disagree	Slightly disagree	Neutral	Slightly agree	Moderately agree	Strongly agree	*For office use*	
Others would get mad at me if I did not participate in academic activities at school	1	2	3	4	5	6	7	V49	
It's fun to participate in academic activities at school	1	2	3	4	5	6	7	V50	
I think that participating in academic activities is part of what learners are supposed to do	1	2	3	4	5	6	7	V51	
I value the experience I have when I participate in academic activities at school	1	2	3	4	5	6	7	V52	
It is satisfying to be able to participate in academic activities at school	1	2	3	4	5	6	7	V53	
I would feel guilty if I did not participate in academic activities at school	1	2	3	4	5	6	7	V54	
Others make me feel good about myself when I participate in academic activities at school	1	2	3	4	5	6	7	V55	
I really value how participating in academic activities enriches school experience.	1	2	3	4	5	6	7	V56	
I believe that participating in academic activities is an important part of the school experience	1	2	3	4	5	6	7	V57	
I would feel bad about myself if I did not participate in academic activities at school	1	2	3	4	5	6	7	V58	
I really enjoy participating in academic activities at school	1	2	3	4	5	6	7	V59	
It will reduce my school experience if I did not participate in academic activities	1	2	3	4	5	6	7	V60	

Section E:

Questions about participation in academic activities in school (e.g. study for a test, participate in class or do assignments). Please indicate the extent to which each reason is true for you, using the 7-point scale below.

	Strongly disagree	Moderately disagree	Slightly disagree	Neutral	Slightly agree	Moderately agree	Strongly agree	*For office use*	
I feel confident in my abilities to participate in academic activities at school	1	2	3	4	5	6	7	V66	
I feel capable of participating in academic activities at school	1	2	3	4	5	6	7	V67	
I am able to participate in academic activities at school	1	2	3	4	5	6	7	V68	
I am able to meet the challenge of participating in academic activities at school	1	2	3	4	5	6	7	V69	

Section F:

Please indicate how much you agree with each statement, using the 7-point scale below.

While participating in academic activities…

	Strongly disagree	Moderately disagree	Slightly disagree	Neutral	Slightly agree	Moderately agree	Strongly agree	For office use	
I feel free to be who I am	1	2	3	4	5	6	7	V71	
I feel like a competent person	1	2	3	4	5	6	7	V72	
I feel loved and cared about by others.	1	2	3	4	5	6	7	V73	
I often feel inadequate or incompetent.	1	2	3	4	5	6	7	V74	
I have a say in what happens and can voice my opinion.	1	2	3	4	5	6	7	V75	
I often feel a lot of distance in my relationships with others	1	2	3	4	5	6	7	V76	
I feel very capable and effective	1	2	3	4	5	6	7	V78	
I feel a lot of closeness and intimacy with others	1	2	3	4	5	6	7	V79	
I feel controlled and pressured to be certain ways.	1	2	3	4	5	6	7	V80	

V82

Thank you for participating in this research!

Appendix 4
Questionnaire/Vraelys Afrikaans

APPENDIX 4 – QUESTIONNAIRE/VRAELYS AFRIKAANS

UNIVERSITEIT VAN PRETORIA
UNIVERSITY OF PRETORIA
YUNIBESITHI YA PRETORIA

Deel A: Demografiese inligting

Baie dankie dat jy deelneem aan hierdie navorsing. Wees asseblief so eerlik as moontlik wanneer jy die vrae beantwoord. Onthou asseblief dat al jou spesifieke antwoorde asook jou naam en van 'n geheim sal bly.

Slegs vir kantoor gebruik

1. Naam en van:…… V1 ____

2. Naam van jou skool:…… V2 ____

3. Hoe oud is jy?…….(tot die naaste jaar) V3 ____

4. Watter gemiddelde persentasie punt verwag jy om te behaal aan die einde van die eerste kwartaal?:…… V4 ____

5. Geslag (Dui asseblief jou geslag aan met 'n kruis bv.: X): V5 ____

Manlik	1	Vroulik	2

6. In watter graad is jy? (Dui asseblief met 'n kruis aan bv. X): V6 ____

Gr 12	2	Gr 11	1

7. Wys asseblief aan watter rassegroep jy hoort? (Dui asseblief aan met 'n kruis bv X): V7 ____

Swart	1
Wit	2
Gekleurd	3
Indiër	4
Asiaties	5
Ander	6

8. Hoeveel **ure** spandeer jy aan jou skool werk **per week?**: …….**ure** V8 ____

9. Beantwoord asseblief die volgende vrae deur om die Ja of Nee blokkie te merk met 'n kruis

Vraag:	**Ja (1)**	**Nee (2)**	
Ontvang jy onderrig in jou huistaal?	Ja (1)	Nee (2)	V9 ____
Het jy 'n spesifieke toekomstige beroep in gedagte?	Ja (1)	Nee (2)	V10 ____
Stel jy vir jouself leerdoelwitte?	Ja (1)	Nee (2)	V11 ____

10. Dui asseblief aan hoe gereeld die volgende faktore jou akademiese prestasie negatief beïnvloed:

	Nooit	Baie min	Elke nou en dan	Somtyds	Amper altyd	Vir kantoor gebruik	
Buitemuurse aktiwiteite (bv. sport)	1	2	3	4	5	V12	
Tyd wat bestee word aan om of televisie te kyk, op jou laptop te speel en/of selfoon	1	2	3	4	5	V13	
Om te sosialiseer (kuier) met vriende	1	2	3	4	5	V14	
Die gebrek aan hulpbronne (om bv. nie boeke te hê nie, vervoer of elektrisiteit probleme	1	2	3	4	5	V15	
Jy voel dat jy nie effektiewe leervaardighede het nie	1	2	3	4	5	V16	
Verpligtinge by die huis (bv. om 'n broer of suster of ouer te versorg)	1	2	3	4	5	V17	
Jy stel nie belang in jou skoolwerk nie	1	2	3	4	5	V18	

11. Dui asseblief aan hoe gereeld jy ondersteuning van die volgende individue ontvang om akademiese sukses te bereik

	Nooit	Baie min	Elke nou en dan	Somtyds	Amper altyd	Vir kantoor gebruik	
Ouers	1	2	3	4	5	V19	
Onderwysers	1	2	3	4	5	V20	
Vriende	1	2	3	4	5	V21	
Broers of susters of ander familielede	1	2	3	4	5	V22	
'n "Au pair" of 'n ander mens wat na jou omsien in die middae	1	2	3	4	5	V23	

Deel B

Lees asseblief die volgende items versigtig deur, dink oor hoe dit relevant is tot jou lewe en dui aan hoe waar dit vir jou is. Merk asseblief die relevante nommer langs die item.

	Stem **nie saam nie**	Stem in 'n mate **nie saam nie**	Stem 'n bietjie **nie saam nie**	Neutraal	Stem **'n bietjie saam**	Stem in **'n mate saam**	**Stem saam**	*Vir kantoor gebruik*	
Ek voel dat my onderwysers my keuses en opsies gee.	1	2	3	4	5	6	7	V24	
Ek voel dat my onderwysers my verstaan.	1	2	3	4	5	6	7	V25	
Ek voel dat ek my gevoelens en houdings op 'n openlike manier met my onderwysers kan deel.	1	2	3	4	5	6	7	V26	
My onderwysers dra hulle geloof in my vermoëns oor.	1	2	3	4	5	6	7	V27	
Ek voel dat my onderwysers my aanvaar.	1	2	3	4	5	6	7	V28	
My onderwysers stel belang in hoe ek my lewe verstaan.	1	2	3	4	5	6	7	V29	
My onderwysers moedig my aan om vra te vra wanneer dit reg is om dit te doen.	1	2	3	4	5	6	7	V30	
Ek vertrou my onderwysers baie.	1	2	3	4	5	6	7	V31	
My onderwysers antwoord my vrae deeglik en versigtig.	1	2	3	4	5	6	7	V32	
My onderwysers luister na hoe ek daarvan hou om dinge te doen.	1	2	3	4	5	6	7	V33	
My onderwysers hanteer my emosies baie goed.	1	2	3	4	5	6	7	V34	
Ek voel dat my onderwysers vir my omgee vir my as persoon.	1	2	3	4	5	6	7	V35	
Ek voel **nie baie goed** oor die manier waarop my onderwysers met my kommunikeer nie.	1	2	3	4	5	6	7	V36	
My onderwysers probeer om te verstaan hoe ek dinge insien.	1	2	3	4	5	6	7	V37	
Ek voel dat ek my emosies kan deel met my onderwysers.	1	2	3	4	5	6	7	V38	

Deel C

Lees asseblief die volgende items versigtig deur, dink oor hoe dit relevant is tot jou lewe en dui aan hoe waar dit is vir jou. Merk asseblief die relevante nommer langs die item.

	Stem **nie saam nie**	Stem in 'n mate **nie saam nie**	Stem 'n bietjie **nie saam nie**	Neutraal	Stem **'n bietjie saam**	Stem in **'n mate saam**	**Stem saam**	*Vir kantoor gebruik*	
Leerder-wees laat my toe om myself uit te leef	1	2	3	4	5	6	7	V40	
My benadering tot my akademiese aktiwiteite reflekteer die persoon wat ek is	1	2	3	4	5	6	7	V41	
My deelname aan akademiese aktiwiteite dra by tot my vorming as 'n persoon.	1	2	3	4	5	6	7	V42	
Ek is die tipe persoon wat floreer deur deel te neem aan akademiese aktiwiteite	1	2	3	4	5	6	7	V43	
Om aan akademiese aktiwiteite deel te neem is 'n sentrale deel van ek is	1	2	3	4	5	6	7	V44	
Om aan akademiese aktiwiteite deel te neem gee betekenis aan my lewe	1	2	3	4	5	6	7	V45	
Ek leef myself uit deur my deelname in akademiese aktiwiteite.	1	2	3	4	5	6	7	V46	
My deelname aan akademiese aktiwiteite is 'n belangrike deel van my lewe	1	2	3	4	5	6	7	V47	

Deel D

Dui asseblief aan hoe waar elke rede vir jou is deur om die 7-punt skaal onder te gebruik. **Ek neem deel aan akademiese aktiwiteite by die skool (bv. leer vir 'n toets, neem deel aan klasbesprekings of doen take) omdat:**

	Stem **nie saam nie**	Stem in 'n mate **nie saam nie**	Stem 'n bietjie **nie saam nie**	Neutraal	Stem **'n bietjie saam**	Stem in **'n mate saam**	**Stem saam**	*Vir kantoor gebruik*	
Ander mense sal kwaad raak vir my as ek nie deelneem aan	1	2	3	4	5	6	7	V49	

akademiese aktiwiteite by die skool nie									
Dis lekker om deel te neem aan akademiese aktiwiteite by die skool	1	2	3	4	5	6	7	V50	
Ek dink dat om deel te neem aan akademiese aktiwiteite is deel van wat leerders veronderstel is om te doen op skool	1	2	3	4	5	6	7	V51	
Ek waardeer die ervaring wat kry het wanneer ek deelneem aan akademiese aktiwiteite by die skool	1	2	3	4	5	6	7	V52	
Dit is bevredigend om aan akademiese aktiwiteite by die skool deel te kan neem.	1	2	3	4	5	6	7	V53	
Ek sou skuldig gevoel het as ek nie aan akademiese aktiwiteite by die skool deelgeneem het nie	1	2	3	4	5	6	7	V54	
Ander mense laat my goed voel oor myself as ek deelneem aan akademiese aktiwiteite by die skool	1	2	3	4	5	6	7	V55	
Ek het baie waardering vir hoe die deelname aan akademiese aktiwiteite by die skool die skool ervaring verryk	1	2	3	4	5	6	7	V56	
Ek glo dat om deel te neem aan akademiese aktiwiteite by die skool ‘n belangrike deel is van die skool ervaring	1	2	3	4	5	6	7	V57	
Ek sou sleg gevoel het oor myself as ek nie aan akademiese aktiwiteite deelgeneem het by die skool nie	1	2	3	4	5	6	7	V58	
Ek geniet dit regtig om deel te neem aan akademiese aktiwiteite by die skool	1	2	3	4	5	6	7	V59	
Dit sal my skool ervaring inperk indien ek nie deelgeneem het aan akademiese aktiwiteite by die skool nie	1	2	3	4	5	6	7	V60	

Deel E:

Vrae oor deelname aan akademiese aktiwiteite by die skool (bv. om te leer vir 'n toets of om deel te neem aan klasaktiwiteite of take te doen). Dui asseblief aan hoe waar elke item vir jou is deur om die 7-punt skaal onder te gebruik

	Stem **nie saam nie**	Stem in 'n mate **nie saam nie**	Stem 'n bietjie **nie saam nie**	Neutraal	Stem **'n bietjie saam**	Stem in **'n mate saam**	**Stem saam**	*Vir kantoor gebruik*	
Ek het selfvertroue in my vermoëns om deel te neem in akademiese aktiwiteite by die skool/	1	2	3	4	5	6	7	V66	
Ek voel ek het die vermoë om deel neem aan akademiese aktiwiteite by die skool	1	2	3	4	5	6	7	V67	
Ek het die vermoë om deelneem aan akademiese aktiwiteite by die skool	1	2	3	4	5	6	7	V68	
Ek het die vermoë om die uitdagings te voldoen wat verband hou met die deelname aan akademiese aktiwiteite by die skool.	1	2	3	4	5	6	7	V69	

Deel F:

Dui asseblief aan hoe waar elke item vir jou is deur om die 7-punt skaal onder te gebruik

Wanneer ek deelneem aan akademiese aktiwiteite.....

	Stem **nie saam nie**	Stem in 'n mate **nie saam nie**	Stem 'n bietjie **nie saam nie**	Neutraal	Stem **'n bietjie saam**	Stem in **'n mate saam**	**Stem saam**	*Vir kantoor gebruik*	
Het ek die vrymoedigheid om te wees wie ek is	1	2	3	4	5	6	7	V71	
Voel ek soos 'n bevoegde mens	1	2	3	4	5	6	7	V72	
Voel ek geliefd en versorg deur ander	1	2	3	4	5	6	7	V73	
Voel ek dikwels onvoldoende en onbevoeg	1	2	3	4	5	6	7	V74	
Het ek 'n se oor wat gebeur en kan my opinie lig	1	2	3	4	5	6	7	V75	
Voel ek dikwels afstand in my verhoudings met ander mense	1	2	3	4	5	6	7	V76	
Voel ek baie bekwaam en effektief	1	2	3	4	5	6	7	V78	

Voel ek baie nabyheid en intimiteit met ander mense	1	2	3	4	5	6	7	V79	
Voel ek dat ek beheer word en daar druk op my geplaas word om op 'n sekere te wees.	1	2	3	4	5	6	7	V80	

V82

Baie dankie dat jy deelgeneem het aan die navorsing!

Appendix 5
Invitation Letter Schools

APPENDIX 5 – INVITATION LETTER SCHOOLS

UNIVERSITEIT VAN PRETORIA
UNIVERSITY OF PRETORIA
YUNIBESITHI YA PRETORIA

Dear Mr./Ms./Dr (*Principal surname*) and School Governing Body.

Thank you for having allowed me the opportunity to have met you personally and discuss your potential involvement in my study. The purpose of this letter is to formally invite the participation of your school in this study.

I am currently in the process of completing my PhD degree in Educational Psychology at the University of Pretoria. I am required to complete an independent research study under supervision in a field of my interest in order to complete my degree. The independent research in which I am currently involved with forms part of a larger research project in which Academic Commitment is investigated. My particular study's name is: The Associations among Self Determination, Academic Commitment and Academic Achievement in Gr 11 and 12 Learners in the Madibeng District: a Case Study.

I have obtained ethical approval from the Ethics Committee from the Faculty of Education of the University of Pretoria which bounds me to ethical and fair research practices. I have also obtained permission from the North West Department of Education to approach your school with this research request.

Research is indicative of a relationship between the provision of need support by the schooling environment and academic achievement by learners. The aim of this research is to explore the possible role and effect of basic need satisfaction by the schooling environment and learner academic achievement. A further goal of this research is to gain insight into how autonomous self-regulatory processes (e.g. how learners regulate their academic efforts independently) as well as how committed learners are to their studies (e.g. how meaningful the school curriculum is to the learner) influence the relationship between need support from the school and learner achievement.

This study could potentially contribute to theoretical understanding but also inform school practices in delivering support to learners. Previous studies have indicated the importance of learner support in optimizing academic achievement as well the facilitation of well-being in learners and academic resilience. Results from this study will potentially assist school practitioners (educators, principals as well as government) to explore effective learner support mechanisms. The results obtained from this study will be reported to the school after the completion of this study to allow for the aforementioned benefits to be implemented.

Parents from Gr 11 and Gr 12 learners will be invited to provide informed consent for their children to participate in this research. These learners will also complete informed assent letters before participating in this research. The purpose of these letters is to fulfill ethical requirements by the University of Pretoria as well as to promote fair and informed practices. I will cover all printing or other operational costs.

Learners will be required to complete a questionnaire The questionnaire will consist of a Biographical Questionnaire in which the learner will be expected to provide answers to demographical questions in order for us to get to know the learner better, a Learning Climate

Questionnaire in which we can explore how their basic needs are met, the Academic Commitment scale in order to explore the personal relevance of the school curriculum and the Academic Self-Regulation Scale to explore ways in which academic efforts are regulated by them. The school will also be asked to provide me with the participating learner's average grade of the 1st semester in order to explore how the aforementioned factors influence academic achievement.

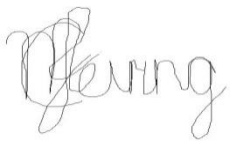
It is estimated that the completion of the questionnaire will take between 15 and 20 minutes. It is requested that these questionnaires be completed by all learners during one specific occasion and that the questionnaire be completed during break time or after school hours in order to prevent any loss of learning time.

The responses of specific learners will not be made available to the school in order to ensure anonymity and truthful responses from learners. An overall presentation of results including correlation between factors investigated in this study will however be presented to the school. The results of the study will be published in the form of a PhD dissertation by the end of 2015 as well as (should results be noteworthy) be published in a peer reviewed journal. The name of your school as well as any other identifying particulars (including the learner's names) will not be included.

Please note that the school's involvement in this research is entirely voluntary and that you as principal or school governing body should not feel obliged or forced to participate. Your careful consideration of your partnership will however be appreciated.

Please do not hesitate to contact me or my supervisors (Prof S Human-Vogel -012 420 2770 and Prof Niemiec from the University of Rochester in New York - niemiec@psych.rochester.edu) if you should have any further questions

Kind Regards



Jeanne Meiring

Educational Psychologist

MEd Educational Psychology (UP)

Appendix 6

Informed Consent Letters (English and Afrikaans)

APPENDIX 6 – INFORMED CONSENT LETTERS (ENGLISH AND AFRIKAANS)

UNIVERSITEIT VAN PRETORIA
UNIVERSITY OF PRETORIA
YUNIBESITHI YA PRETORIA

INVITATION TO PARTICIPATE IN RESEARCH:

The Associations among Self Determination, Academic Commitment and Academic Achievement in Gr 11 and 12 Learners in the Madibeng District: a Case Study.

It is required of students, completing their Doctorate degree in Educational Psychology at the University of Pretoria, to undertake independent research in a field of their interest. This letter contains information regarding one such a research endeavor in order to inform parents of potential participants regarding their choice to participate as well as to provide consent in an informed manner. The researcher undertaking this research is under strict supervision of a senior lecturer at the University of Pretoria, and has received ethical clearance from the Ethics Board of the University of Pretoria, which bounds conduct that is ethical and honest. Permission has also been obtained from the North West Department of Education to approach parents of potential participants.

What is the research about?

Research is indicative of a close association between need support by the school environment and academic achievement by learners. The aim of this research is to explore the possible role and effect of basic need satisfaction by the schooling environment and learner academic achievement. A further goal of this research is to gain insight into how autonomous self-regulatory processes (e.g. how learners regulate their academic efforts independently) as well as how committed learners are to their studies (e.g. how meaningful the school curriculum is to the learner) influence the relationship between need support from the school and learner achievement. This study could potentially contribute to theoretical understanding but also inform school practices in delivering support to learners.

What will be expected from your child?

As a participant in this research, learners will be expected to complete a questionnaire during March 2015. The completion of the questionnaire should take between 15 and 20 minutes. The questionnaire consist of a Biographical Questionnaire in which the learner will be expected to provide answers to demographical questions in order for us to get to know your child better, a Learning Climate Questionnaire in which we can explore how their basic needs are met, the Academic Commitment scale in order to explore the personal relevance of the school curriculum, a Academic Self-Regulation Scale to explore ways in which academic efforts are regulated by them as well as a Perceived Competence Questionnaire.

During a second and final phase of data collection the school will be requested to provide me with your child's average mark for the first quarter in order to understand how the aforementioned factors influence academic achievement.

Participation in this research is entirely voluntary and you should not feel forced to provide permission for your child to participate in this research in any way. You or your child can at any time decide to withdraw any contribution to the study and your wishes will be respected, and all information will be withdrawn from the study. Parents and learners are also urged to ask questions and gain clarity about any aspect unclear to them throughout the process

Confidentiality and anonymity:

All information provided to the researcher will be kept in the strictest confidence and will only be used for the purpose of research. The researcher will not divulge any contact or identifying information

to any other third party (e.g. School or any other third party). Learners are required to provide their names but pseudonyms will be used when necessary in reporting the findings.

Presentation of results:

The findings of this study will be presented in the form of a PHd dissertation at the end of 2015. Should this study provide valid and noteworthy insight, the possibility does exist for it to be published in a peer-reviewed journal. The information gathered for this research becomes the property of the University of Pretoria and may be used for further research in the future

Thank you for your interest in allowing your child to participate in this research. Please do not hesitate contacting me (Jeanne Meiring – 0829406225) or my supervisor (Prof. Salome Human-Vogel 012 420 2770 or Prof Niemiec from the University of Rochester in New York - niemiec@psych.rochester.edu) if you are unsure about any aspect regarding this research. Kindly fill out the following letter in order to provide informed consent for your child to participate in the research.

LETTER OF INFORMED CONSENT

By signing underneath I acknowledge that I have read the above mentioned information and would like to voluntarily provide permission for my child to participate in this research. I am aware of what will be expected from my child and the school, and that I have the right to withdraw my child's participation at any time should I or my child feel in any way uncomfortable or mislead. By signing this form I give consent to record information relevant to this research study. Furthermore, I am acknowledging the fact that I am providing consent for my child to participate in this research out of my own free will and have not been forced, or mislead into taking part.

_____

Name of Learner

_____ _____

Signature Parent or Legal Guardian Date

_____

Signed – Researcher Date

_____

Signature Supervisor

Prof S Human-Vogel

UNIVERSITEIT VAN PRETORIA
UNIVERSITY OF PRETORIA
YUNIBESITHI YA PRETORIA

UITNODIGING OM DEEL TE NEEM AAN NAVORSING:

Die verhouding tussen selfbeskikking, akademiese toewyding en akademiese prestasie in Gr 11 en 12 leerders in die Madibeng Distrik: 'n gevallestudie.

Dit word van studente verwag wat hul Doktorsgraad in Opvoedkundige Sielkunde aan die Universiteit van Pretoria voltooi, om onafhanklike navorsing te onderneem in 'n studierigting waarin hulle belangstel. Hierdie brief bevat inligting oor 'n navorsingsprojek om ouers van voornemende deelnemers ten opsigte van hul keuse om deel te neem, in te lig sowel as om toestemming te verleen op ‘n ingeligte wyse. Die navorsingsprojek is onder streng toesig van 'n senior dosent aan die Universiteit van Pretoria, en het etiese klaring ontvang van die Etiek Raad van die Universiteit van Pretoria, wat verbind is tot etiese en eerlike navorsingspraktyke. Toestemming is ook verkry van die Noordwes Departement van Onderwys om ouers van voornemende deelnemers te nader.

Waaroor gaan die navorsing?

Navorsing dui aan dat daar ‘n noue verband is tussen leerders se persepsies oor behoefte ondersteuning deur die skoolomgewing en akademiese prestasie deur leerders. Die doel van hierdie navorsing is om die moontlike rol en invloed van die leerder se persepsies oor basiese behoefte bevrediging te ondersoek en ook hoe dit leerders se akademiese prestasie beïnvloed. 'n Verdere doel van hierdie navorsing is om insig te verkry in hoe outonome self-regulerende prosesse (soos hoe leerders hul eie akademiese pogings benader) asook hoe toegewyd leerders aan hul studies is (soos hoe leerders hul skool omgewing vir hulself betekenisvol maak) die verhouding tussen behoefte ondersteuning en leerderprestasie beïnvloed. Hierdie studie kan moontlik bydra tot die teoretiese uitbreiding, maar ook op ‘n praktiese wyse help om meer inligting te verkry oor leerderondersteuning.

Wat sal van jou kind verwag word?

As 'n deelnemer aan hierdie navorsing sal daar van leerders verwag word om 'n vraelys gedurende Maart 2015 te voltooi Die voltooiing van die vraelys sal tussen 15 en 20 minute neem. Die vraelys bestaan uit 'n biografiese vraelys waar daar van die leerder verwag sal word om demografiese vrae te beantwoord, 'n leerklimaatvraelys waarin ons kan evalueer wat leerders se persepsies is oor basiese behoeftes voorsiening, die akademiese verbintenisskaal om die persoonlike relevansie van die akademiese aktiwiteite te bepaal, 'n self-reguleringskaal om maniere waarop akademiese pogings gereguleer word te ondersoek sowel as hul eie persepsie oor vaardigheidvraelys om die leerder se persepsies oor hul vaardighede te ondersoek.

Tydens 'n tweede en finale fase van data-insameling sal die skool gevra word om jou kind se gemiddelde punt vir die eerste kwartaal aan my te voorsien om ten einde te verstaan hoe die bogenoemde faktore akademiese prestasie beïnvloed.

Deelname aan hierdie navorsing is heeltemal vrywillig en u moet nie gedwing voel om toestemming vir u kind se deelname aan die navorsing te gee nie. U of die kind kan enige tyd besluit om enige bydrae tot die studie te onttrek en jou wense sal gerespekteer word. Alle inligting sal uit die studie onttrek word indien jy dit so sou verkies. Ouers en leerders word ook aangemoedig om vrae te vra om duidelikheid te verkry oor enige aspek waaroor hulle onseker is.

Vertroulikheid en anonimiteit:

Alle inligting wat deur die navorsingsprojek versamel word sal streng vertroulik gehou word en sal slegs gebruik word vir navorsingsdoeleindes. Die navorser sal nie enige kontak- of identifiseringsbesonderhede aan enige derde party gee nie (bv. skool of enige ander derde party).

Aanbieding van resultate:

Die bevindinge van hierdie studie sal in die vorm van 'n PhD-proefskrif aan die einde van 2015 verskyn. Indien hierdie studie tot geldige en noemenswaardige bevindinge lei kan dit moontlik gepubliseer word in ‘n wetenskaplike, portuurbeoordeelde tydskrif. Die inligting wat ingesamel is vir hierdie navorsing word die eiendom van die Universiteit van Pretoria en kan gebruik word vir verdere navorsing in die toekoms

Dankie vir jou belangstelling in die moontlike deelname van jou kind in die navorsing. Moet asseblief nie huiwer om my (Jeanne Meiring - 0829406225) of my studieleiers (Prof. Salome Human-Vogel 012 420 2770 of prof Niemiec van die Universiteit van Rochester in New York - niemiec@psych.rochester.edu) te kontak indien u onseker is oor enige aspek oor die navorsing nie. Vul asseblief die volgende brief in om ten einde ingeligte toestemming te gee vir u kind se deelname aan die navorsing.

BRIEF VAN INGELIGTE TOESTEMMING

Ek erken dat ek die bogenoemde inligting gelees het en graag vrywillige toestemming wil gee sodat my kind kan deelneem aan die navorsing. Ek is bewus wat van my kind en die skool verwag word, en dat ek die reg het om my kind se deelname op enige tyd te onttrek indien ek of my kind op enige manier ongemaklik of mislei voel. Deur die ondertekening van hierdie vorm gee ek toestemming dat inligting wat verband hou met die navorsingsprojek versamel mag word. Verder erken ek dat vrywilliglik toestemming gee vir my kind om deel te neem aan die navorsing en dat niemand my gedwing het nie.

_____

Naam van leerder

_____ _____

Handtekening Datum

Ouer of wettige voog

_____ _____

Onderteken – Navorser Datum

_____ _____

Handtekening Studieleier Datum

Prof S Human-Vogel

Appendix 7

Informed Assent Letters (English and Afrikaans)

APPENDIX 7 – INFORMED ASSENT LETTERS (ENGLISH AND AFRIKAANS)

UNIVERSITEIT VAN PRETORIA
UNIVERSITY OF PRETORIA
YUNIBESITHI YA PRETORIA

INVITATION TO PARTICIPATE IN RESEARCH:

The Associations among Self Determination, Academic Commitment and Academic Achievement in Gr 11 and 12 Learners in the Madibeng District: a Case Study.

My name is Jeanne Meiring and I am a student at the University of Pretoria completing a Doctorate degree. In order for me to complete the degree, I need to do research on a specific topic that I find interesting. The purpose of this letter is to provide you the opportunity to consider being a part of my research.

What is the research about?

I am also an Educational Psychologist and one aspect of my job is to find out which factors may help learners such as yourself reach high marks at school. We already know from research that has been done previously that academic achievement (or obtaining high marks at school) may be the result of support from your school. But we also want to know about what you think about schoolwork and what you are supposed to learn and how this influences your marks. If we had more information about this, we would know how to make school environments more supportive for learners such as yourself as well as answer some important other questions.

What will be expected from you?

You will be expected to complete a questionnaire during March 2015, should you agree to be a part of this research. It should take you between 15 and 20 minutes to complete the questionnaire. The questionnaire consists of aspects in which we will ask you things such as your age and race and other aspects which will look into your ideas about schoolwork and the school environment. We will also ask your school to give us your average marks at the end of the second quarter so that we can see how all of the factors mentioned earlier influence your marks

It is your own choice whether you want to participate or not

Your participation in this research is absolutely voluntary. We have sent a letter to your parents to give permission for you to be a part of the research, but it remains your decision whether you want to be a part of the research or not. You can stop being a part of the research at any stage if you want to. Please ask any questions if you are unsure of anything.

Will anyone know that it was me filling out the questionnaire?

We will ask you to write down your name. But we will not tell your school what you specifically wrote on the questionnaire. We will also not write your name in any book or article. Your name and specific answers will be kept a secret.

Thank you for considering to be part of this research. Please do not hesitate contacting me (Jeanne Meiring – 0829406225) or my supervisor (Prof. Salome Human-Vogel 012 420 2770 or Prof Niemiec from the University of Rochester in New York - niemiec@psych.rochester.edu) if you are unsure about anything related to this research. Kindly fill out the following letter to give your own permission to be a part of this research.

LETTER OF INFORMED CONSENT

By signing underneath I agree that I have read the letter and would like to be a part of this research out of my own free will. I understand what will be expected from me and my school and that I can stop being a part of this research at any time if I want to or feel that I need to. By signing this form I give permission to record personal information important to this research study.

Signed – Researcher Date

_____ _____

Signature Supervisor Date

Prof S Human-Vogel

_____ _____

Learner/Participant Date

UNIVERSITEIT VAN PRETORIA
UNIVERSITY OF PRETORIA
YUNIBESITHI YA PRETORIA

UITNODIGING DEEL TE NEEM AAN NAVORSING:

Die verhoudings tussen selfbeskikking, akademiese toewyding en akademiese prestasie in Gr 11 en 12 leerders in die Madibeng Distrik: 'n gevallestudie.

My naam is Jeanne Meiring, ek is 'n student by die Universiteit van Pretoria en ek voltooi 'n doktorsgraad. Om ten einde die graad te voltooi, moet ek navorsing te doen oor 'n spesifieke onderwerp wat ek interessant vind. Die doel van hierdie brief is om jou die geleentheid te gee om te oorweeg of jy deel van die navorsing wil wees.

Wat is die navorsing oor?

Ek is ook 'n Opvoedkundige Sielkundige en een aspek van my werk is om uit te vind watter faktore leerders kan help om hoë punte by die skool te kry. Ons weet reeds uit navorsing wat voorheen gedoen is dat akademiese prestasie (of die verkryging van 'n hoë punte op skool) kan veroorsaak word deur die hoeveelheid ondersteuning wat jy voel jy ontvang. Maar ons wil ook weet wat jy dink oor jou skoolwerk en wat jy veronderstel is om te leer en hoe dit jou punte beïnvloed. As ons meer inligting oor hierdie kry, sal ons weet hoe skoolomgewings meer ondersteunend vir leerders te maak asook ‘n paar ander interessante vrae kan beantwoord.

Wat sal van jou verwag word?

Daar sal van jou verwag word sal verwag word om 'n vraelys gedurende Maart 2015 te voltooi. Dit behoort jou tussen 15 en 20 minute te neem om die vraelys te voltooi. Jy sal gevra word om die volgende inligting te gee: ouderdom, geslag en skool ook asook watter idees jy het oor jou skoolomgewing en skoolwerk. Ons sal ook jou skool vra om ons jou gemiddelde punte aan die einde van die eerste kwartaal te gee, sodat ons kan sien hoe al die faktore wat vroeër genoem is leerders se punte beïnvloed

Dit is jou eie keuse of jy wil deelneem of nie

Jou deelname aan hierdie navorsing is absoluut vrywillig. Ons het 'n brief aan jou ouers gestuur om toestemming te gee vir jou om deel van die navorsing te wees, maar dit bly jou besluit of jy wil 'n deel van die navorsing wees of nie. Jy kan onttrek van die navorsing op enige stadium as jy wil. Vra asseblief enige vrae as jy onseker is oor enige iets.

Sal enigiemand weet wat my antwoorde op die vraelys is?

Ons sal jou vra om jou naam neer te skryf. Maar ons sal nie jou skool vertel wat jy spesifiek geskryf het op die vraelys nie. Ons sal ook nie jou naam skryf in 'n boek of artikel nie. Jou naam en spesifieke antwoorde sal ‘n geheim bly.

Dankie vir die oorweging om deel van hierdie navorsing te wees. Moet asseblief nie huiwer om my te kontak (Jeanne Meiring - 0829406225) of my studieleiers (Prof. Salome Human-Vogel 012 420 2770 of prof Niemiec van die Universiteit van Rochester in New York - niemiec@psych.rochester.edu) indien jy onseker is oor enigiets wat verband hou met hierdie navorsing. Vul asseblief die volgende brief in om jou eie toestemming te gee om deel van die navorsing te wees.

BRIEF van ingeligte toestemming

Ek stem saam dat ek die brief gelees het en dat ek graag uit my eie vrye wil sal deelneem aan hierdie navorsing. Ek verstaan wat van my en my skool verwag word en dat ek enige tyd kan ophou om deel te wees van hierdie navorsing. Deur die ondertekening van hierdie vorm gee ek toestemming dat my persoonlike inligting gebruik mag word vir bogenoemde navorsing.

Onderteken – Navorser

Datum

Handtekening Studieleier

Datum

Prof S Human-Vogel

Leerder handtekening

Datum

Appendix 8

The Original Rotated Pattern Matrix for the Autonomous Self-Regulation Questionnaire and Meaningful Commitment Scale, Including all Items.

APPENDIX 8 – THE ORIGINAL ROTATED PATTERN MATRIX FOR THE AUTONOMOUS SELF-REGULATION QUESTIONNAIRE AND MEANINGFUL COMMITMENT SCALE

			Component 1	Component 2	Component 3
V40	Meaningful commitment	Being a learner allows me to express myself completely.	***.57***	.06	-.12
V41	Meaningful commitment	My approach to my academic activities reflects who I am as a person.	***.72***	-.03	-.04
V42	Meaningful commitment	My participation in academic activities contribute to shaping me as a person.	***.59***	.16	.02
V43	Meaningful commitment	I am the kind of person who thrives on participating in academic activities.	***.79***	.08	.04
V44	Meaningful commitment	Participating in academic activities is a central aspect of who I am.	***.81***	.05	.09
V45	Meaningful commitment	Academic activities lend meaning to my life.	***.72***	.05	.12
V46	Meaningful commitment	I express myself through my participation in academic activities.	***.81***	.07	.00
V47	Meaningful commitment	Participating in academic activities is an important part of my life.	***.62***	.22	.05
V50	Intrinsic regulation	It's fun to participate in academic activities at school	.30	***.63***	-.16
V52	Identified regulation	I value the experience I have when I participate in academic activities at school	.01	***.90***	-.13
V53	Intrinsic regulation	It is satisfying to be able to participate in academic activities at school	.14	***.80***	-.05
V56	Identified regulation	I really value how participating in academic activities enriches school experience.	.12	***.67***	.15
V57	Identified regulation	I believe that participating in academic activities is an important part of the school experience	.05	***.74***	.12
V59	Intrinsic regulation	I really enjoy participating in academic activities at school	.34	***.60***	-.03
V49	External regulation	Others would get mad at me if I did not participate in academic activities at school	.20	-.46	***.73***
V51	Introjected regulation	I think that participating in academic activities is part of what learners are supposed to do	.04	***.73***	.06

V54	Introjected regulation	I would feel guilty if I did not participate in academic activities at school	-.19	.24	***.81***
V55	External regulation	Others make me feel good about myself when I participate in academic activities at school	.14	.15	***.54***
V58	Introjected regulation	I would feel bad about myself if I did not participate in academic activities at school	-.07	.22	***.76***
V60	External regulation	It will reduce my school experience if I did not participate in academic activities	-.01	***.47***	***.45***

Appendix 9

The Rotated Pattern Matrix for the Autonomous Self-Regulation Questionnaire and Meaningful Commitment Scale, Excluding Both V60 and V51.

APPENDIX 9 – THE ROTATED PATTERN MATRIX FOR THE AUTONOMOUS SELF-REGULATION QUESTIONNAIRE AND MEANINGFUL COMMITMENT SCALE, EXCLUDING BOTH V60 AND V51.

			Component 1	Component 2	Component 3
V40	Meaningful commitment	Being a learner allows me to express myself completely.	***.60***	.03	-.13
V41	Meaningful commitment	My approach to my academic activities reflects who I am as a person.	***.73***	-.04	-.05
V42	Meaningful commitment	My participation in academic activities contribute to shaping me as a person.	***.58***	.17	.02
V43	Meaningful commitment	I am the kind of person who thrives on participating in academic activities.	***.77***	.11	.03
V44	Meaningful commitment	Participating in academic activities is a central aspect of who I am.	***.79***	.07	.08
V45	Meaningful commitment	Academic activities lend meaning to my life.	***.73***	.06	.11
V46	Meaningful commitment	I express myself through my participation in academic activities.	***.80***	.11	.00
V47	Meaningful commitment	Participating in academic activities is an important part of my life.	***.63***	.21	.05
V50	Intrinsic regulation	It's fun to participate in academic activities at school	.28	***.63***	-.09
V52	Identified regulation	I value the experience I have when I participate in academic activities at school	-.00	***.90***	-.09
V53	Intrinsic regulation	It is satisfying to be able to participate in academic activities at school	.09	***.83***	-.03
V56	Identified regulation	I really value how participating in academic activities enriches school experience.	.10	***.69***	.17
V57	Identified regulation	I believe that participating in academic activities is an important part of the school experience	.07	***.69***	.15
V59	Intrinsic regulation	I really enjoy participating in academic activities at school	.33	***.62***	-.02
V49	External regulation	Others would get mad at me if I did not participate in academic activities at school	.22	-.47	***.72***
V54	Introjected regulation	I would feel guilty if I did not participate in academic activities at school	-.20	.23	***.83***

V55	External regulation	Others make me feel good about myself when I participate in academic activities at school	.08	.22	***.55***
V58	Introjected regulation	I would feel bad about myself if I did not participate in academic activities at school	-.07	.22	***.78***

Appendix 10

Correlation Matrix Including Autonomous and Controlled Motivation (excluding Both V 51 and V60)

APPENDIX 10 – CORRELATION MATRIX INCLUDING AUTONOMOUS AND CONTROLLED MOTIVATION (EXCLUDING BOTH V 51 AND V60)

	Need support	Meaningful commitment	Autonomous motivation	Controlled motivation	Perceived competence	Need satisfaction	Academic achievement
Need support	**1**	**.48****	**.46****	**.19****	**.37****	**.47****	**.17****
Meaningful commitment		1	**.75****	**.43****	**.48****	**.46****	.10
Autonomous motivation			1	**.50****	**.57****	**.46****	**.14****
Controlled motivation				1	**.26****	**.15***	.04
Perceived competence					1	**.45****	**.29****
Need satisfaction						1	**.16****
Academic achievement							1

Correlation significance levels: * p < .05, ** p < .01 (2-tailed)

Appendix 11

Correlation Matrix Including Autonomous and Controlled Motivation (Excluding V60)

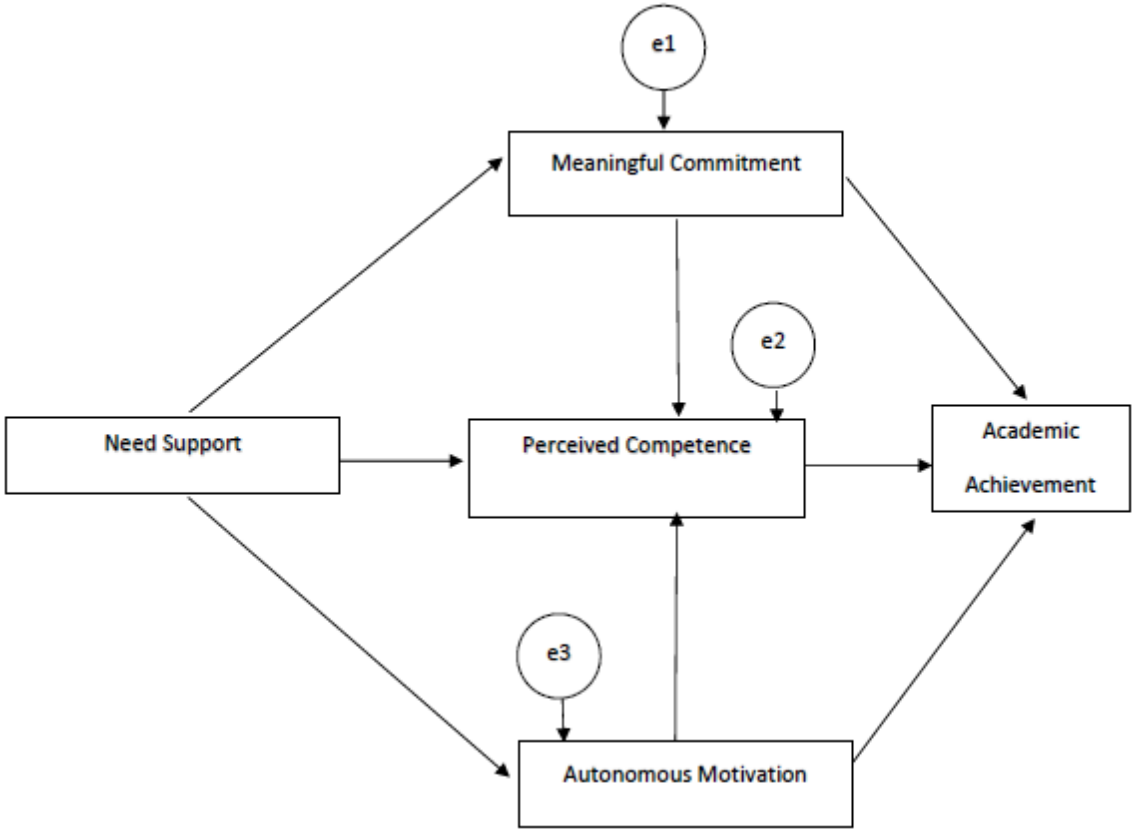
APPENDIX 11 – CORRELATION MATRIX INCLUDING AUTONOMOUS AND CONTROLLED MOTIVATION (EXCLUDING V60)

	Need support	Meaningful commitment	Autonomous motivation	Controlled motivation	Perceived competence	Need satisfaction	Academic achievement
Need support	**1**	**.48****	**.46****	**.25****	**.37****	**.47****	**.17****
Meaningful commitment		1	**.75****	**.51****	**.48****	**.46****	.10
Autonomous motivation			1	**.61****	**.57****	**.46****	**.14****
Controlled motivation				1	**.34****	**.18****	.07
Perceived competence					1	**.45****	**.29****
Need satisfaction						1	**.16****
Academic achievement							1

Appendix 12

Original Model 3 Version with Poor fit-indices

APPENDIX 12 – ORIGINAL MODEL 3 VERSION WITH POOR FIT-INDICES



Model-fit indices for the original model 3 version:

	(x^2)	RMSEA	IFI	AGFI	CFI
Model	215.61	.55	.62	.36	.62
Acceptable ranges		<.06	>.90	>.90	>.90

---oooOooo---