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The Relationship between PsyCap and Innovation

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"A research report submitted in partial fulfilment of the requirements for the degree of Masters by coursework and research report in the field of Organisational Psychology in the faculty of Humanities, University of the Witwatersrand, Johannesburg"

Plagiarism Declaration

I declare that this research project is my own, unaided work. It has not been submitted before for any other degree or examination at this or any other university

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Abstract

In today's competitive world innovation is an increasingly important factor for an organisation's survival and effectiveness. However, literature has been limited in determining the psychological processes that underlie employee's innovative behaviour. Therefore, the current study investigated the relationship between psychological capital, innovative characteristics and innovative behaviour. The sample comprised of 485 employees working in the tourism and automotive industries. The study used a non-experimental cross-sectional design. The results suggested that there were strong positive relationships between psychological capital, innovative characteristics and innovative behaviour.

Keywords:

Psychological Capital, Innovative characteristics, Innovative behaviour.

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Introduction

In recent years, increasing attention has been paid to the role of positive psychology in the workplace. Positive psychology is defined as "the study of the strengths and virtues that enable individuals, communities and organisations to thrive" (Sheldon & King, 2001, p. 201). From this movement, Luthans (2002) coined the term 'Positive organisational behaviour', which is the study of positively orientated human resource psychological strengths (Luthans, 2002). Luthans and Youssef (2004, 2007) then developed four constructs (confidence, optimism, hope and resilience), that met the criteria of positive organisational behaviour, which they termed 'Positive Psychological Capital'. Psychological capital has been an important construct for the workplace because it has been linked to increasing production, satisfaction, organisational citizenship behaviours and reducing stress (Avey, Reichard, Luthans & Mhatre, 2011). Although the research on psychological capital has looked at important job outcomes, there has been a limited amount of research on psychological capital and innovation.

Innovation helps an organisation discover and implement novel ideas that sets them apart from their competitors (Gumusluoglu & Ilsev, 2009). This ultimately creates a platform for organisational development and profitability (Gumusluoglu & Ilsev, 2009). Thus, innovation can be crucial for organisational effectiveness (Ortt & Duin, 2008). Although there has been a lot of research on innovation, research on the processes that underlie employee's innovative behaviour has been lacking. This is problematic, as employees are a necessary aspect for an organisation to be innovative because innovation begins with employees engaging in innovative behaviour (Kheng & Mahmood, 2013). Thus, it is crucial to understand the underlying innovative characteristics that contribute to employee innovative behaviour.

Therefore, this research study aimed to provide a clearer understanding of some of the psychological processes that underpin innovative behaviour in organisations by investigating the relationship between psychological capital, innovators' characteristics, and innovative behaviour.

Chapter 1: Literature review

This chapter describes the empirical and theoretical background of this study. It begins by defining the important constructs of psychological capital, innovative behaviour and innovative characteristics. Thereafter, psychological capital and broaden-and-build theory are outlined to give theoretical evidence for the link between psychological capital and innovative behaviour. Lastly, empirical research of psychological capital and innovative behaviour are outlined, which highlights the gap in existing research and the need for this study.

1.1 Psychological capital

Psychological capital (PsyCap) is a theory that was developed from positive organisational behaviour introduced by Luthans and his colleagues (2002). Positive organisational behaviour has been defined as "the study and application of positively orientated human resources strengths and psychological capacities" (Luthans, 2002, p 59). The aim of positive organisational behaviour is to understand employee behaviour to improve organisational performance and employee morale (Luthans, 2002). Luthans and his colleagues (2002) developed positive organisational behaviour based on a set of five criteria. The criteria are: positive organisational behaviour must be measurable, it must contribute to performance, it must be unique, it must be grounded in theory and research, and it must be state-like (Luthans, 2002). Luthans and his colleagues (2002) then identified four constructs that met the criteria of positive organisational behaviour, which they termed positive psychology capital (PsyCap).

Positive psychological capital is defined as "an individual's positive psychological state of development that is characterised by having confidence (self-efficacy), optimism, hope, and resilience" (Luthans, Youssef & Avolio, 2007, p. 3). Each of the four components of PsyCap (self-efficacy, optimism, hope and resilience) have considerable theoretical evidence, which contributes to the integrative theoretical foundation of PsyCap. This theoretical foundation of PsyCap views each construct as "state-like". A state-like construct is more stable than states (feelings) but not as static as personality traits (Luthans, 2002). In other words, a state-like construct is on a continuum that falls between pure states (that change often) and pure traits (that are

based on genetics and are difficult to change) (Luthans, 2002). This state-like component of PsyCap makes this construct unique, as unlike the approaches of positive psychology and human resource management that focuses on personality traits, PsyCap focuses on variables that can be developed (Luthans & Youssef, 2004). PsyCap has also been found to predict unique variance in employee behaviours and attitudes (Avey, Luthans & Youssef, 2010). Lastly, research has demonstrated that each PsyCap construct can be measured validly and improve performance (Luthans & Youssef, 2004).

To have a clearer understanding of psychological capital, it is important to define each construct. In the next paragraph, the first PsyCap construct that will be defined is self-efficacy.

1.2 Self-efficacy

Self-efficacy comes from Bandura's (1977) social cognitive and social learning theory. Self-efficacy refers to an individual's belief or confidence to produce certain outcomes (Bandura, 1977). For example, an individual's confidence to reach a challenging goal. Thus, self-efficacious individuals are more likely to choose difficult tasks and persevere, as they are confident that they will achieve desired outcomes (Bandura, 1977). Self-efficacy can also determine how individuals think and feel (Bandura, 1977). For example, people with low self-efficacy are generally stressed and helpless, while people with high self-efficacy make higher quality decisions and are more likely to achieve academically. Bandura (2012) also outlines ways for individuals to develop self-efficacy for personal and social change. There are four principal sources of self-efficacy; mastery experiences (success in a task will create more confidence), social modeling (seeing people succeed increases belief in own abilities), social persuasion, and emotional state (belief in oneself).

Although Bandura is the main theorist of self-efficacy, Stajkovic and Luthans (1988) expanded on Bandura's definition of self-efficacy. They defined self-efficacy as "an individual's confidence about his or her abilities to mobilize the motivation, cognitive resources and courses of action needed to successfully execute a specific task" (Stajkovic & Luthans, 1998, p. 66). Although, both definitions of self-efficacy used

the term “confidence” when referring to self-efficacy, these constructs are still distinct. Self-efficacy is a specific perceived belief of one’s ability, while confidence reflects a degree of certainty and a broad belief about one’s ability (Bandura, 1997). However, these terms are still used interchangeably in research.

The second PsyCap construct that will be defined is optimism.

1.3 Optimism

Optimism has been defined as “a mood associated with an expectation about the social or material future, one which the evaluator regards as socially desirable” (Tiger, 1979, p. 8). This definition of optimism is not objective, as Tyler (1979) states that what is considered as optimism is dependent on what an individual perceives as desirable. However, what an individual considers as desirable may be unrealistic. Thus, Weinstein and Klein (1996) noted that you can get an unrealistic optimist. An unrealistic optimist is an individual that expects that they will more likely experience a positive outcome and less likely experience a negative outcome compared to others (Weinstein & Klien, 1996). For example, an unrealistic optimist may think they will never die from smoking, even though other people have died from smoking. Although optimism can be viewed in a negative way, dispositional and explanatory style optimism focuses on a realistic optimist.

Dispositional optimism is based on Rotter’s (1954) expectancy theory, which states that people that have optimistic expectations will strive towards achievement, even when faced with difficulties. Dispositional optimism is also based on a personality trait of a general tendency for people to expect positive outcomes (Carver, Scheier & Segerstrom, 2010). Thus, dispositional optimism views optimism as a trait.

Unlike dispositional optimism, optimistic explanatory style views optimism as a state. An optimistic explanatory style is when one views positive events as something pervasive, personal and permanent, and negative events as temporal, external and situation specific (Seligman, 1998). For example, an optimist will take credit if something good happens in their life, while a pessimist will not take credit and when something negative happens, they tend to blame themselves. Seligman’s (1998)

definition is in line with the optimism construct of PsyCap, as it views optimism as a state.

The optimism construct of PsyCap not only views optimism as a state and realistic, but also views optimistic individuals as flexible. Flexible optimistic individuals correctly assess the situation and choose when it is best to use an optimistic or pessimistic explanatory style (Luthans et al., 2007). Thus, flexible and realistic optimistic individuals have strong self-discipline, they can analyze past events and they are contingent planers (Luthans et al., 2007).

The third PsyCap construct that will be outlined is hope.

1.4 Hope

Hope is defined as "a positive motivational state that is based on an interactively derived sense of successful agency and pathways" (Snyder, Irving & Anderson, 1991, p.287). Agency refers to one's motivation and perceived capacity to achieve goals, while pathways refer to one's plan to achieve goals (Snyder, 2002). Snyder's theory of hope can be seen as the most dominant paradigm for understanding what constitutes hope and the consequences of hope (Du & King, 2012). Snyder's (2002) theory of hope regards hope as a cognitive state. This means that a hopeful individual can set challenging goals, be motivated to achieve those goals, and at the same time they are able to identify and generate one or more pathways to reach those goals (Luthans., et al 2007).

Although Snyder's theory of hope has considerable face validity, Bernardo (2010) criticized it for having a very individualistic conceptualization because external factors that may influence hope are not taken into account. Bernardo (2010) expanded on Snyder's theory of hope by including the locus of hope dimension. The locus of hope dimension looks at the importance of significant others and external forces in the experience of hope (Bernardo, 2010). There are two types of locus of hope; peer locus of hope and spiritual locus of hope. A person who has a peer locus of hope believes that their family or peers have the agency and pathways to help them achieve the goal (Bernardo, 2010). A spiritual locus of hope is when an individual believes that God or

something supernatural can help them achieve a goal (Bernardo, 2010). Thus, unlike Snyder's theory of hope that only looked at the individual's experience of hope, Bernardo's theory looked at external forces that might influence an individual's level of hope. However, despite this limitation of Snyder's theory of hope, PsyCap uses Snyder's theory to define hope because Bernardo's theory is still relatively recent and Snyder's theory of hope has empirical evidence (Curry, Snyder, Cook, Ruby & Rehm, 1997; Snyder, 2002).

The last construct of PsyCap that will be discussed is Resilience.

1.5 Resilience

In order to understand the concept of resilience, it is necessary to describe its roots. Resilience was first seen as a rare personality trait because researchers thought that only a small number of people can be resilient (Luthans et al., 2006). Research on schizophrenic mothers and the affects this had on their children played a crucial role in changing the view of childhood resilience (Garmezy, 1971). Garmezy's (1971) study found that a large number of children were able to overcome their difficult childhood and were able to live healthy lives. His study and a few others (Werner & Smith, 1992; Cicchetti & Rogosch, 1997; Luthar, 2015) confirmed that resilience is not something that is rare. Resilience was then defined as "a class of phenomena characterized by patterns of positive adaption in the context of a significant adversity risk" (Masten & Reed, 2002, p.75). This definition of resilience views resilient individuals as people who have sufficient assets and low risk factors (Masten & Reed, 2002). Assets are measurable characteristics that bring about positive outcomes, while risk factors predict negative outcomes (Masten & Reed, 2002). Thus, resilient individuals successfully adapt to adversity when they have access to assets, such as peer support and low risk factors. This definition of resilience also views resilience as a trait.

Although most research in positive psychology treats resilience as a disposition (trait), there has been evidence that shows resilience as state-like (Coutu, 2002). For example, Werner and Smith (1992) did a longitudinal study on resilience and found that resilience can change over time. Based on research such as this, Luthans and his

colleagues (2002) see resilience as a state rather than a trait and define resilience as the capability to 'bounce back' from failure and adversity (Luthans, 2002).

Although resilience is widely studied it also has some limitations. Researchers tend to use different definitions of resilience, which results in them using diverse measurement (Luthar, Cicchetti & Becker, 2000). This leads us to question whether the research on resilience is dealing with the same construct or with different phenomena (Luthar et al., 2000). However, the PsyCap construct of resilience does not have this limitation, as resilience has been clearly defined and operationalized.

Each of the four PsyCap constructs outlined above have common processes that drive behaviour (Luthans et al., 2010). The commonalities between self-efficacy, optimism, hope, and resilience is that they share a sense of control, goal pursuit and intentionality (Luthans, Carolyn & Morgan, 2017). For example, optimistic individuals view their chances of achieving goals to be high, while a self-efficacious individual chooses challenging goals. In the same way, a hopeful individual promotes the generation of pathways toward goals, and resilient individual's recover from setbacks in achieving that goal. Thus, these constructs maintain a sense of control and intentionality to pursue goals. The PsyCap constructs can also influence each other. For example, it is said that optimism, self-efficacy and hope can act as pathways to bring about resilience (Luthans et al., 2006). At the same time, resilient individuals influence hope because if a hopeful individual cannot accomplish a goal, but they have a sense of resilience, it will help them bounce back to find an alternative pathway (Luthans et al., 2010).

Although each PsyCap construct has common processes, they are still distinct. For example, self-efficacy is a belief about one's abilities, while optimism is an expectation of a positive outcome (Luthans, Avery, Avolio & Peterson, 2010) One can also have high self-efficacy but be pessimistic. For example, an employee can have confidence about a specific task within their job, yet they can still be pessimistic and believe that they can be dismissed regardless of their abilities (Luthans et al., 2010). Optimism is also distinct from hope, as an optimist can get stuck if a goal is too difficult for them, but a hopeful individual will be able to produce new pathways to achieve that goal (Snyder, 1995). Resilience also differs from hope, as although the

pathways component of hope can represent resilience in that they both have flexibility, resilience is still distinctively different because a hopeful individual cannot "bounce back" after a disruptive event (Luthans, Vogelgesang & Lester, 2006). Lastly, resilience also differs from optimism, as resilient individuals have a strategic approach when dealing with stress, where optimistic individuals will just brush off the stressful event by thinking positively (Luthans et al., 2006). Thus, resilient individuals tend to adapt better than optimistic individuals (Luthans et al., 2006).

Although the PsyCap constructs are distinct, Luthans, Youssef and Avolio (2007) have provided empirical evidence to support psychological capital as a single construct. For example, they found that each of the four constructs loaded best onto one core factor of PsyCap (Luthans et al., 2007). In addition, research suggests that studying psychological capital as one construct predicts job outcomes better than its individual constructs (Luthans et al., 2007). For example, if an employee is hopeful, optimistic and resilient, they should be more confident to persist in pursuing alternative pathways (Luthans, Avolio, Avey & Normon, 2007). PsyCap has also been shown to better predict job satisfaction, organisational commitment, stress, and performance than its individual constructs. This was revealed in a meta-analysis, which showed a strong significant relationship between PsyCap, desirable employee attitudes (organisational commitment, psychological well-being and job satisfaction,) and performance, compared to PsyCaps individual constructs (Avey, Reichard, Luthans & Mhatre, 2011).

The job outcomes that PsyCap has been shown to influence are important for effective organisational functioning (Avey, 2011). This is because individuals that have positive psychological capital are more likely to take on challenging tasks, cope well under stress when faced with difficulties, come up with alternative solutions, and optimistically take on important tasks. Although the research on psychological capital has looked at important job outcomes, there has been a limited amount of research on psychological capital and innovation. This will be shown later in this chapter.

1.6 Innovation

Before this research study can look at innovation, it is important to first look at its roots from creativity, as creativity forms part of innovation. Creativity refers to one's ability to generate novel and valuable ideas or the ability to create solutions to problems (Amabile, 1983). There has been some debate around the definition of creativity and innovation, as the terms are sometimes used interchangeably, but they are in fact distinct constructs (Zhou & Hoever, 2014). Creativity is essentially a driver of innovation (Gong, Cheung, Wang & Huang, 2012), while innovation is built on creative ideas and has to do with one's ability to implement those creative ideas (King & Anderson, 2002). A formal definition of innovation is presented below.

Innovation can be defined as "the generation, acceptance and implementation of new ideas, processes products or services" (Thompson, 1965, p.2). Van du Ven (1986) stated that innovation is any idea that is perceived as something new. Plessis (2007, p. 21) defined innovation as "the creation of new knowledge and ideas to facilitate new business outcomes". Lastly, Wong, Tjosvold and Lui (2008, p.2), defined innovation as "the effective application of processes and products new to the organisation". Clearly, innovation has been defined in many ways, and is related to many constructs, including products, behaviours, traits and individual characteristics (Kleysen & Street, 2001; Adams, Bessant & Phelps, 2006). This research study will be focusing on innovative behaviour, which has a more standard definition.

Innovative behaviour refers to actions that are directed at generating and implementing novel ideas (Kleysen & Street, 2001). Most of the research on innovation has only assessed one dimension of innovative behaviour, such as, the development of new ideas (Kleysen & Street, 2001). However, Kleysen and Street (2001) have identified more dimensions of innovative behaviours, namely opportunity exploration, application, generativity, championing and formative investigation (Kleysen & Street, 2001).

Opportunity exploration refers to paying attention to opportunities, searching for opportunities to innovate, identifying opportunities, and the ability to gather information about opportunities (Van de Ven, 1988; Kanter, 1988). Application refers to making innovation a regular part of business (Kleysen & Street, 2001). This can be

done by, developing, implementing, modifying and routinizing innovation (Anderson & King, 1993; Rogers, 1983). Generativity refers to generating ideas for the purpose of improvement, generating solutions to opportunities, and generating ideas from different angles (Kanter 1988; Farr & Ford, 1990). Championing involves behaviours related to selling an innovative idea despite setbacks and building coalitions by negotiating and taking risks (Kanter, 1983; Howell & Higgins, 1990). Formative investigation refers to one's ability to formulate, experiment and evaluate ideas and solutions (Amabile, 1988). Therefore, innovative behaviour can be seen as a process of problem recognition, generating ideas, building support and implementation (Kanter, 1988).

Although there have not been many studies that have examined all these innovative behaviour constructs together, there has been a lot of empirical evidence on each of these innovative behaviour constructs (Van de Ven, 1998; Kanter 1998; Far & Ford, 1990; Howell & Higgins, 1990). Therefore, this research study will be using Kleysen and Street (2001) multidimensional construct of innovative behaviour due to its empirical evidence.

Research on innovative behaviour has looked at its importance for organisational effectiveness. (Hakimian, Farid, Ismail & Nair, 2015). For example, Hughes et al., (2018) found that innovative behaviour is positively and significantly related to performance. Other studies have also found that innovative behaviour is positively related to an organisations competitive advantage (Chen, Lin & Chang, 2009; Akis, 2015; Urbancova, 2013). There has also been a fair amount of research that has assessed ways to promote innovative behaviour in the workplace. For example, Hakimian, Farid, Ismail and Nair (2016) found that organisational commitment increased employee's innovative behaviour. Other studies have also found that job satisfaction and a leader's influence can make employees more innovative (Bystead, 2013; Hrnjic & Djidelija, 2018). Subsequent research found that an organisations culture can also influence employees innovative behaviour (Laforet, 2016)

Although research has explored ways to make employees more innovative, research on the processes that underlie employee's innovative behaviour has been lacking.

However, Dyer Gregersen and Christensen (2011) recognized the relationship between innovative characteristics and innovative behaviour. They found that the ability for individuals to generate and implement novel ideas is dependent on an innovator's "DNA" (Dyer et al., 2011). For example, they found that individual's that can make connections across seemingly unrelated ideas, challenge the status quo, embrace change, take risks, experiment with ideas, question ideas, and pay attention to detail have the necessary cognitive and behavioural skills to be innovative (Dyer et al., 2011). The theoretical framework that was based on this study was termed "The innovators' DNA" (Dyer et al., 2011).

Deyer, Gregersen and Christensen (2009) proposed "The innovators' DNA" in the Harvard Business Review (2009), where they reported research from a six-year study to determine how innovative individuals came up with ideas to invent new products or start innovative organisations (Deyer et al., 2009). They did this by looking at five-hundred top innovators of the time. For example, they examined how Scott Cook (founder of Intuit), Jeff Bezos (founder of Amazon), and Steve Jobs (CEO of Apple) came up with new ideas. Once the study was completed, Dyer, Gregerson and Christensen (2009), identified five key innovative characteristics (Associating, Networking, Questioning, Experimenting and Observing) that underpinned these innovators' behaviours.

Associating refers to one's ability to connect problems that are unrelated and connect ideas in new ways (Dyer et al., 2009). Networking is the ability of an individual to devote their time to finding new ideas and then testing these ideas through a network of diverse people with different ideas (Dyer et al., 2009). Questioning is the willingness for individuals to constantly ask questions that challenge the norm and their assumptions (Dyer et al., 2009). Experimenting refers to seeking out new surroundings and having a sense of intellectual exploration. Experimenting individuals also like to try out new ideas and tend to provoke unorthodox responses (Dyer et al., 2009). Lastly, observing is the ability to consciously and consistently

observe small details to help gain insight into new ways of doing things (Dyer et al., 2009).

It must be noted that there has not been much research on this model, partly because there has only been one study (Barak, Watted & Haick, 2019) that developed a questionnaire to measure these constructs. Barak, Watted and Haick (2019) operationalized networking, questioning, experimenting and observing constructs of innovative characteristics. The associating construct of innovative characteristics was not included in the questionnaire. Barak and her colleagues (2019) developed a scale for these innovative characteristics and determined that each of these characteristics loaded onto one construct. This is the only study that has examined the innovators DNA model. Thus, clearly more research is needed. Therefore, this research study tested the innovative characteristics model by determining the factor structure of each innovative characteristic (including associating) and by examining its relation to innovative behaviour.

Having described PsyCap, innovative behaviours and innovators' characteristics, it now remains to link them together. In order to give theoretical evidence for the link between psychological capital and innovation, this research study has used psychological capital and broaden-and-build theory, which is outlined below.

1.7 Theoretical Framework

Luthans and his colleagues (2007) argue that the four constructs of PsyCap (self-efficacy, optimism, hope, and resilience) are a strong predictor of positive organisational behaviour. Avey, Nimnicht and Graber (2010) argue that PsyCap predicts organisational behaviour better than other constructs, such as personality dimensions. Innovative behaviour can be seen as a key organisational behaviour. Therefore, PsyCap is expected to predict innovative behaviour, as PsyCap is a strong predictor of organisational behaviour and individuals with high PsyCap have been found to have a higher capability and perseverance to implement innovative ideas (Avey, Luthans & Youssef, 2010).

PsyCap may also be linked to innovation based on the individual PsyCap constructs. The first construct that can be linked to innovative behaviour is self-efficacy.

People that have self-efficacy believe that they can accomplish the task they undertake (Stajkovic & Luthans, 1988). Individuals that believe in their abilities are more motivated to take on challenging tasks and are more persevering when faced by obstacles. Self-efficacious individuals are therefore more likely to be innovative, as they will be motivated to propose new and useful ideas, and they will persevere when faced by setbacks. The ability to be innovative and creative can also be risky because the generation of novel ideas can often fail (Carmeli & Schaubroeck, 2007). Self-efficacious individuals are more prone to taking risks because their belief in their abilities motivates them to promote unorthodox responses (Bandura, 1997). Thus, a self-efficacious individual will more likely produce innovative behaviour, as they are willing to take risks, which forms part of the 'championing' component in innovative behaviours and the 'experimenting' component of innovative characteristics outlined above (Kanter, 1983; Howell & Higgins, 1990).

The second construct that can be linked to innovative behaviour is optimism. Optimistic individuals view negative events as something temporary and external, and positive events as something personal (Seligman, 1998). Thus, optimists will expect and take credit for positive events in their lives, and distance themselves from negative events (Rego, Sousa, Marques & Cunha, 2012). Distancing themselves from negative events decreases the likelihood of self-blame, and depression, while taking credit for positive events increases an optimist's self-esteem (Rego et al., 2012). Thus, an optimistic individual is less likely to give up when faced with difficulties because they believe they have control over events (Luthans, Youssef & Avolio, 2007). Therefore, optimistic individuals will more likely produce innovative behaviour, as they rarely loose hope in finding creative ways to solve problems (which relates to the 'championing' component in innovative behaviours and the 'experimenting' component of innovative characteristics outlined above) (Rego et al., 2012).

The third PsyCap construct that can be linked to innovative behaviour is hope. Luthans, Youssef and Avolio (2007), suggested that hopeful individuals are independent thinkers, risk takers and are less conforming to the ideas of other people. Hopeful individuals also have high willpower (agency) to perform creatively and explore alternative pathways (Snyder, 1995). Therefore, hopeful individuals are more likely to be innovative, as they are motivated to go against the norm (which relates to the 'experimenting' component of innovative characteristics), they are motivated to look for different opportunities to innovate when faced by obstacles (which relates to 'opportunity exploration' of innovative behaviours), and they have the ability to generate new ideas from different angles (which relates to the 'generativity' component of innovative behaviours) (Kanteer 1988; Far & Ford, 1990).

The fourth PsyCap construct that can be linked to innovative behaviour is resilience. Resilient individuals are open to new experiences, adaptable and perseverant (Tugade, Fredrickson & Barrett, 2004). Innovation requires perseverance in order to move beyond setback in trying to implement creative outcomes (Amabile, 1983). Therefore, innovation requires resilience because resilient individuals can provide the mechanisms to be perseverant and 'bounce back' when faced by challenges (Luthans et al., 2007). Resilient individuals are also good at improvising in situations that have a lot of uncertainty (Luthans et al., 2007). Thus, resilient individuals will more likely produce innovative behaviour, as they can develop new ways of doing things when they are faced with unexpected challenges (which relates to the generativity component of innovative behaviours and the 'experimenting' component of innovative characteristics outlined above) (Rego et al., 2012).

Although we can see a potential link between PsyCap and innovative behaviour from the definitions of each construct, the broaden-and build theory of positive emotions can further emphasize this link.

The broaden-and-build theory states that "discrete positive emotions have the ability to broaden people's momentary thought-action repertoires and then build an individuals' personal resources" (Fredrickson, 2001, p. 3). This means that positive emotions can broaden one's attention (increase openness), cognition (cognitive flexibility and creativity) and social cognition (expansion of how we view ourselves

in relation to others) (Fredrickson, 2001). Thus, people with positive emotions tend to experience greater creativity and innovative problem solving. This is due to the fact that positive emotions expand individuals thinking, which increases motivation for individuals to pursue creative novel actions and thought (Fredrickson, 1988).

Luthans, Youssef and Rawski (2011), suggested that individuals that build up their psychological resources, such as the constructs in PsyCap, regularly experience positivity, as the core construct of PsyCap represents one's positive appraisal of circumstances based on motivation and perseverance. Thus, psychological capital can broaden momentary thought-action repertories, which will manifest into innovative performance and creativity. For example, the positive emotions created by hope can broaden the range of hope pathways, which will help develop innovative quality solutions when faced by obstacles. Similarly, optimistic expectations can facilitate this broadening effect and can increase one's desire for innovative outcomes. Therefore, psychological capital should have a positive relationship with innovative behaviour.

This study has further explored whether the relationship between psychological capital and innovation exists by looking at empirical evidence for each PsyCap construct below.

1.8 Research on self-efficacy

Most of the research on self-efficacy has been done in the context of academic achievement (Usher & Pajares, 2008). This research stemmed from Bandura's definition of self-efficacy. For example, Bandura, Zimmerman and Pons (1992) found that if a student has low self-efficacy it affected their perceived self-efficacy for academic achievement. This was shown to influence the student's goals and in turn their academic achievement (Bandura et al., 1992). Many other studies have followed from this study and have found similar results. For example, a review that examined self-efficacy in a school concluded that most of the research shows that self-efficacy can influence academic achievement (Usher & Pajares, 2008). Further research on self-efficacy expanded from this by looking at a teacher's self-efficacy and how this may affect their satisfaction, and their student's achievement (Skaalvik & Skaalvik,

2010; Klassen & Chiu, 2010; Caprara, Barbaranelli, Steca & Malone, 2005). For example, Klassen and Chiu (2010) found that a teacher's low self-efficacy is related to stress, which in turn influenced their satisfaction. Similarly, Caprara et al (2005) found that self-efficacy affected a teacher's job satisfaction, which in turn affected student's academic achievement. Although most studies on self-efficacy have focused on academic achievement, there have been some studies that looked at self-efficacy in the workplace.

Most of the research on self-efficacy in the workplace have been focused on transformational leadership (Liu, Siu & Shi, 2009; Nielson & Munir, 2009; Nielson, Yarker, Randall & Munir, 2009). For example, Lui et al (2009) found that the relationship between transformational leadership, job satisfaction and perceived work stress was mediated by self-efficacy. Nielsen and Munir (2009) further found that the relationship between transformation leadership and well-being was medicated by self-efficacy. There have also been a few studies that looked at self-efficacy, career commitment and employee performance. For example, Olusola (2011) found that self-efficacy, job satisfaction, and motivation predicted job performance. Ballout (2009) further looked at career commitment and self-efficacy. Ballout (2009) found that the relationship between self-efficacy and career commitment influenced employee performance (Ballout, 2009).

There has also been some research on creative self-efficacy in the workplace. Creative self-efficacy refers to one's belief about their ability to achieve creative outcomes (Tierney & Farmer, 2002). Although this is not the same as self-efficacy, creative self-efficacy was derived because there has been evidence that has shown self-efficacy as an essential condition for creative outcomes (Bandura, 1997; Ford, 1996; Tierney & Farmer, 2002). Thus, the link between self-efficacy and creativity brought about the term creative self-efficacy. Although creative self-efficacy is not the same construct that this research study is examining, it can still give us an indication that there can be a link between self-efficacy and an aspect of innovation (creativity). The studies done on creative self-efficacy and creativity will be given below.

One longitudinal study that was built from the framework of self-efficacy, found that as creative self-efficacy increased so did creative performance (Tierney & Farmer,

2011). The advantage of this study was that it was longitudinal. Another study that was cross-sectional collected data from 430 participants and found that the relationship between creative self-efficacy and creative performance was mediated by motivation (Choi, 2004). Similarly, Prabhu, Sutton and Sauser (2008) collected data from 124 participants and found that the relationship between creative self-efficacy and creative performance was meditated by intrinsic motivation.

Although there have been some studies that looked at creative self-efficacy in the workplace, there has been very limited research that investigates the relationship between self-efficacy and innovation. An exception to this, is research undertaken by Kumar and Uzkhurt (2011). Kumar and Uzkurt (2011) collected data from 271 employees using questionnaires and found that there was a positive relationship between self-efficacy and innovation (Kumar & Uzkurt, 2011). This has been the only study on self-efficacy and innovation. Thus, this research study builds on Kumar and Uzkurt (2011) study by examining the relationship between self-efficacy, innovative behaviour and innovative characteristics.

The second construct that will be examined in relation to innovation is optimism.

1.9 Research on optimism

Most of the research on optimism has been on coping strategies and mental well-being. For example, Nes and Segerstorm (2006) found that optimism was significantly related to coping strategies, which reduced and managed an individual's stress. Thus, they also found that optimism was negatively related to avoidant coping strategies (Nes & Segerstorm, 2006). Other studies have directly looked at the relationship between optimism and mental well-being. For example, Hart, Vella and Mohr (2008) found that optimistic individuals did not exhibit depressive symptoms, and Wong and Lim (2009) found that optimism predicted life satisfaction. The research on optimism then expanded from mental well-being to physical well-being. A meta-analytic review that looked at 132 studies found that optimism significantly predicted health outcomes (Rasussmen, Scheier & Greenhouse, 2009). For example, optimists were less likely than pessimists to have pain, coronary heart disease and cancer (Rasussmen et al., 2009).

Most studies in the workplace view optimism as state like because research has found that trait optimism did not predict organisational outcomes (Kluemper, Little & Degroot, 2009). For example, one study found that state optimism was significantly related to job satisfaction, job performance and burnout, while a non-significant relationship was found for trait optimism (Kluemper, Little & Degroot, 2009). The majority of research on optimism in the workplace has looked at performance (Jensen, Luthans, Lebsack & Lebsack, 2007; Medlin & Green, 2009; Luthans, Lebsack & Lebsack, 2008). For example, Luthans et al (2007) found that optimistic nurses had higher customer satisfaction and overall higher work performance.

Although there is a lot of research of optimism in the workplace, no studies directly looked at optimism and innovation. Nevertheless, one study looked at the moderating role of optimism. Hsu, Hou and Fan (2011) found that optimism played a moderating role for creative self-efficacy and innovation (Hsu et al., 2011). Although there is limited research that looks at the relationship between optimism and innovation, there are some studies that looked at the relationship between optimism and creativity. For example, Rego and his colleagues (2012) found that optimism directly predicted creativity, and optimism also predicted creativity when it was mediated by positive affect (Rego et al., 2012). Subsequent research found that individuals that had higher levels of optimism were more likely to be creative (Le, Cropley & Gleaves, 2015). However, this study had a very small sample size (N=66). Thus, the results cannot be generalized (Faber & Fonseca, 2014).

Although there is very limited research on optimism and innovation, studies have shown there is a link between optimism and creativity. Therefore, it is likely that there would also be a link between optimism and innovation. Thus, this research expanded from the studies that looked at creativity to examine if there is a relationship between optimism, innovative behaviour and innovative characteristics.

The third construct that will be examined in relation to innovation is hope.

1.10 Research on hope

There has been a variety of research on hope. However, like self-efficacy most of this research has looked at academic achievement (Snyder, 2002; Rand, Martin & Shea,

2011). This may be due to the key theorist of hope (Snyder) that did a lot of research in this field. For example, Snyder et al (2002) did a six-year longitudinal study that found hope to improve overall grades. Following this, there have been many other studies that have looked at the impact of hope on academic achievement. For example, Rand, Martin and Shea (2011) found that hope did in fact predict academic achievement. Another study found that hope influenced students grade expectations, which in turn influenced their academic performance (Rand, 2009). Some studies have also explored the role of hope and procrastination. Alexander and Onwuegbuzie (2006) found that students that had high levels of hope did not procrastinate as much when studying for exams. Similarly, Bilge (2009) found that hope had a significant negative affect on procrastination.

Research on hope has also looked at athletic achievement and burnout. For example, a study on athletic achievement found that when athletes were more hopeful, they performed significantly better (Curry, Snyder, Cook, Ruby & Rehm, 1997). Subsequent research that looked at athlete burnout found that there was a significant negative relationship between hope and athlete burnout (Gustafsson, Skoog, Podlog, Lundqvist & Wagnsson, 2013; Gustafsson, Hassmen & Podlog, 2010). Lastly, research on hope has also focused on life satisfaction and well-being. For example, Gallagher and Lopez (2009) found that hope was significantly related to eudemonic well-being (personal growth, self-acceptance, and autonomy). Subsequent research found that hope was significantly and positively related with life satisfaction (O'Sullivan, 2011).

It must be noted that most of these studies measured hope as a trait, rather than Luthans 'state-like' definition of hope. Nevertheless, some of the research of hope in the workplace is based on Luthans conceptualization of hope. These studies examined hope, performance and satisfaction. For example, Luthans and Youssef (2007) found that hope had a positive relationship with job satisfaction and performance. Another study found that hopeful leaders were more profitable than leaders that were not hopeful (Peterson & Luthans, 2003). Although some research in the workplace conceptualized hope as state-like, other research measured hope as a trait. For example, Peterson and Byron (2008) measured hope as a trait and found that employees that had more hope had higher performance. Similarly, Combs, Smith and

Nadkarni (2010) measured hope as a trait and found a positive relationship between hope and performance.

The research of hope as an individual construct in the workplace is very limited compared to the other constructs of PsyCap. There has also been no research on hope and innovation. However, there has been some research on hope and creativity. This will be outlined below.

Rego, Machado, Leal and Cunha (2009) investigated hopeful employees and creativity. They found that hope predicted all dimensions of creativity (useful ideas, ideas championing and novel ideas), and that hope predicted creativity when it was mediated by happiness (Rego et al., 2009). However, this study is not very generalizable, as they only had a sample size of 125 participants. Nevertheless, another study that had 507 retail employees and used the same scales, found that hope predicted creativity when it was partially mediated by positive affect (Rego, Sousa, Marques & Cunha, 2012).

Although there have been no studies that looked at the relationship between hope and innovation, these studies show that there is a link between hope and creativity. Therefore, there could be a potential link between hope and innovation, as creativity falls part of innovation. Thus, this research study addressed this gap by examining the relationship between hope, innovative behaviour and innovative characteristics.

The fourth construct that will be examined in relation to innovation is resilience.

1.11 Research on resilience

Research on resilience has been studied by diverse disciplines, such as psychology, sociology, psychiatry, and biological disciplines. The majority of this research has looked at children's resilience to trauma. For example, children living in poverty have been found to be resilient (Howell, 2011). Research has also found that children are resilient when they have substance-abusing parents, parents that have severe psychopathology, and if they have been through abuse (Howell, 2011). Subsequent research has also looked at protective factors that help children to be more resilient. This type of research came from positive psychology, as it moved away from risks of

resilience (Rutter, 2012). For example, a review found that family protective factors (family structure, family cohesion, social support, and supportive parents) helped foster resiliency (Benzies & Mychasiuk, 2008). Other protective factors that have been found in studies are individual characteristics. For example, Benzies and Mychasiuk (2009) found that a child's temperament, health and coping skills increased resilience. The research on resilient protective factors further developed into interventions to help children overcome adversity. Alvord and Grados (2005) looked at various interventions that strengthened assets and protective factors. For example, the intervention included active parent involvement, training in relaxation and self-control techniques (Alvord & Grados, 2005).

Research on resilience in the workplace has been limited. However, there has been some research on nursing (Dobie, Tucker, Ferrari & Rogers, 2016; Halm et al., 2005). For example, Rushton and her colleagues (2015) found that nurses that had high resilience were less likely to feel emotionally exhausted, and they experienced greater personal accomplishment. Another study found that resilience was negatively related to psychological distress and burnout among nurses (Zou et al., 2016). Other studies have looked at resilience and satisfaction. For example, Matos and her colleagues (2010) found that nurses that reported high levels of resilience also reported high levels of job satisfaction. Subsequent research found that resilience increased job satisfaction and decreased turnover among nurses (Hudgins, 2016). Research on the benefits of resilience resulted in interventions to help increase satisfaction and decrease burnout for nurses. For example, Foster, Cuzzillo and Furness (2018) developed a resilience program to help strengthen the mental health of nurses. The nurses found that this intervention taught them useful skills and helped strengthen their resilience (Foster et al., 2018).

Although there has been research on resilience that has looked at satisfaction and burnout amongst nurses, there has been no research on innovation and creativity. However, there has been some links that are embedded in studies that have different aims. For example, Helson (1999) conducted a longitudinal study that looked at creative personality traits in women for 30 years. One of the findings indicated that there was a significant relationship between resilience and a creative personality (Helson, 1999). Other studies have looked at organisational resilience and

organisational innovation. Organisational resilience refers to organisations that deliberately adjust and renew the design of structures and their organisational processes (Christensen, 2006). Organisational innovation refers to the ability for an organisation to make new changes and implement different structures (Mafabi, Munene & Ntaya, 2012). This study found that there was a significant relationship between organisational resilience and organisational innovation (Mafabi et al., 2012). Although these are not the same constructs that this study will be looking at, it can still give an indication that there can be a link between a form of resilience and innovation.

Although research on each PsyCap construct and innovation has been examined, it is also important to examine the research on PsyCap as a whole. This is because research has shown that studying psychological capital as one construct predicts job outcomes better than its individual constructs (Luthans, 2002).

1.12 Research on psychological capital

Research on PsyCap and innovation has been done internationally and not in South Africa. For example, In Iran Ziyae, Mobaraki and Saeediyoun (2015) collected data from 100 participants using a self-report questionnaire. They found that there was a significant relationship between psychological capital and innovation in information technology (Ziyae et al., 2015). In Pakistain Abbas and Rajai (2015) had a sample of 237 participants that was based on supervisor ratings. They also found that individuals who scored high in psychological capital were more likely to be innovative (Abbas & Rajai, 2015). Although both these studies had significant results, they did not have a large sample size. Nevertheless, there have been other studies that looked at creativity that had a bigger sample size. For example, Zubair and Kamal (2015) collected data from 532 employees using a self-report questionnaire. They found that work related flow and psychological capital were significantly and positively associated with creativity (Zubair & Kamal, 2015). Lastly, a study that had even more participants (899), found that psychological capital and each of its constructs were positively related to creative performance (Sweetman, Luthans, Avey & Luthans, 2011).
As can be seen, there has been limited research on psychological capital and innovation. However, the studies that exist, do show a link between psychological

capital and innovation. Thus, this research study has built from these studies, as further research needs to be done. The sample sizes were also not large enough to generalize, especially the sample sizes for the innovation studies as opposed to the studies done on creativity. Therefore, this research study has gathered a larger sample size to see if there is in fact a relationship between psychological capital and innovative behaviour. There have also been no studies that looked at PsyCap and innovation in South Africa. Innovation is important to consider in South Africa because it is a developing country that has a large unemployment rate. Innovation can help increase employment by increasing an organisations competitive advantage, which will create more business. This research study has addressed this gap in research by examining innovation in a South African context.

Having showed that PsyCap and each of its constructs can be linked to innovation, this research study will move on to show why it is important to further examine this relationship.

1.13 Rationale

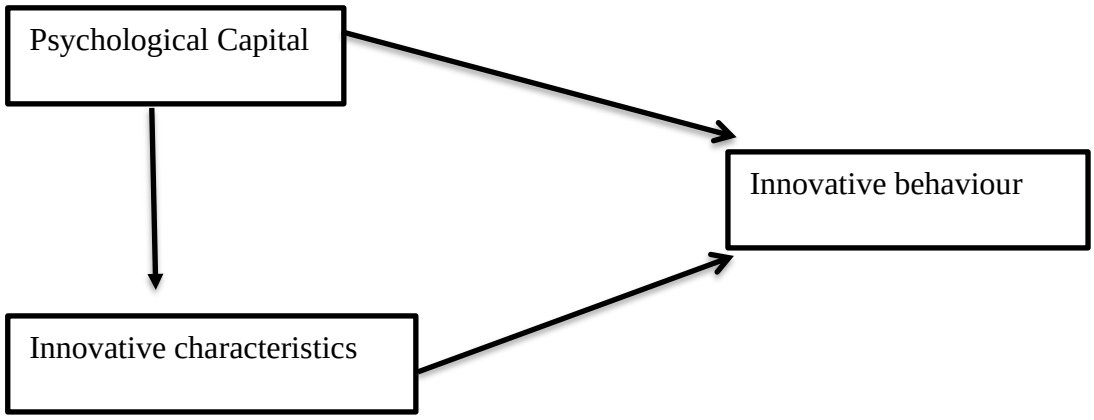
Psychological capital asserts that self-efficacy, optimism, hope and resilience are important because they are strong predictors of positive job outcomes (satisfaction, productivity, organisational citizenship behaviours) (Avey et al., 2011). One form of a positive job outcome that PsyCap has been shown to influence from theoretical and empirical evidence is innovative behaviour. Innovative behaviour is an important construct to consider because it has been linked to increasing productivity and helping organisations maintain a competitive advantage (Ortt & Duin, 2008). The importance of innovative behaviour is key to a developing country like South Africa, as innovation can help create new businesses, which may increase employment opportunities. More innovative organisations may also help develop South Africa's economy because it can enable organisations to enter new markets and gain an international competitive advantage.

There has also been a limited amount of research that has looked at the underlying processes that make up an innovative individual. This is important because employees are a crucial factor for organisational innovation. Thus, we need to understand the

psychological processes that underpin innovative behaviour to help future research develop effective interventions. This could help employees develop the necessary skills to promote innovation and organisational effectiveness. Thus, this research study addressed this gap from the following research questions:

RQ1: What is the factor structure of the innovative characteristics' measure?
RQ2: Does innovative characteristics relate to innovative behaviour?
RQ3: Does psychological capital relate to innovative characteristics?
RQ4: Does psychological capital relate to innovative behaviour?

Figure 1
PsyCap, innovative characteristics and innovative behaviour model



Chapter 2: Method

This chapter will first describe the research design of this study. Thereafter, the sample and sampling strategy will be discussed. The instruments that were used to collect the data will then be outlined, followed by the procedure that this study followed. Lastly, the ethical considerations, and an overview of the data analysis that was conducted to obtain the results will be discussed.

2.1 Research design

The research design of this study is quantitative, non-experimental, cross-sectional, and correlational. This research study collected numerical data and it was measured statistically, thus it is a quantitative based study. This research study was non-experimental because no variables were manipulated, there was no control group or experimental group, and there was no random assignment. A disadvantage of this design is that it cannot be used to validate theories and no causality can be established (Howitt & Cramer, 2005). However, a non-experimental design can be beneficial because it is an inexpensive approach, and significant relationships can be established (Howitt & Cramer, 2005).

This research study is explanatory, specifically correlational because the aim of this research study is to investigate the strength of the relationship between PsyCap, innovative behaviour and innovative characteristics. A disadvantage of this design is that no casualty can be established, and the results will not indicate why a relationship was found (Stangor, 2011). However, this design can establish a relationship between variables, make predictions, and is easy to implement (Stangor, 2011). Lastly, this research study is cross-sectional, as the data was collected at only one point in time.

In order to determine the strength of the relationship between PsyCap, innovative behaviour and innovative characteristics, this research study gathered an acceptable sample of employees. This sample will be outlined below.

2.2 Sample and sampling

The sampling strategy of this research study was non-probability convenience sampling. A limitation of this sampling strategy is that it does not represent the

population, as no random assignment was used (Acharya et al., 2013). Non-probability sampling also means that there is no way to ensure that everyone had an equal chance of being included in the study (Rosnow & Rosenthal, 2005). However, this sample strategy is appropriate for this research study, as a considerable sample size can be gathered in a short space of time and it is cost effective (Acharya et al., 2013). The sampling strategy was also convenient because it was reliant upon employee's volunteering (Rosnow & Rosenthal, 2005).

The sample of this study comprised of male and female employees in South Africa, and there were no exclusion criteria in terms of race, position, tenure, and so forth. The employees came from a tourism company, an automotive company, and a travel agency. The tourism company has approximately 600 employees, the automotive company has approximately 120 employees, and the travel agency has 14 employees. Ultimately 678 employees answered the questionnaire. However, some employees did not complete all the relevant sections. These employees had to be excluded from the study. The final sample size was 485 employees. This is expected, as a sample size may drop more than half due to people not wanting to participate or incomplete answers that have to be excluded (Bartlett, Kotrlik & Higgins, 2001).

The instruments used to collect the sample for this research study will be outlined below.

2.3 Instruments

This research study collected the data using five questionnaires (self-developed demographic questionnaire, self-report PsyCap measure, self-report innovative behaviour measure, self-report innovative characteristics measure, and a self-report associating subscale measure). The demographic questionnaire (Appendix A) asked the participants about their gender, age, race, language, marital status, job level, job title, job industry, and tenure. The questions on gender, marital status, race, language, and job level were in a multiple-choice format, while the remaining questions required the participants to provide a short answer. These details were used to describe the sample and no identifying information was requested.

Psychological capital was measured using the PsyCap questionnaire developed by Luthans, Avolio, Avey (2007) (Appendix A). This measure is copyrighted. Permission to use the scale was obtained by submitting an application to Mind Garden (Appendix B). This scale has 24 items and is answered on a 6-point likert scale that ranges from one, which states 'strongly disagree' to six, which states 'strongly agree'. A high score indicates high levels of psychological capital, while a low score indicates low levels of psychological capital. This questionnaire has 4 subscales (self-efficacy, optimism, hope and resilience). Items of each subscale were modified by Luthans and his colleagues (2007) from pre-existing instruments. For example, the subscale of self-efficacy was adapted from Parker's (1998) scale; hope was adapted from the State Hope Scale (Snyder et al., 1996); optimism was adapted from the Life orientation test (Scheier & Carver's, 1985), and resilience was adopted from Wagnild and Young's (1993) scale.

Psychological capital is a widely used international measure (Newman, Ucbasaran, Zhu & Hirst, 2014; Jensen & Luthans, 2006; Larson & Luthans, 2006). This scale was found to have high internal consistency reliability (0.89) and a confirmatory factor analysis confirmed that the overall PsyCap measure had a higher-order factor structure (Luthans et al., 2007). The PsyCap subscales were found to have moderate internal consistency reliabilities; hope (0.75), resilience (0.71), self-efficacy (0.75) and optimism (0.74) (Luthans et al., 2007). The PsyCap measure has also been validated in South Africa, and high internal consistency reliability was also found (0.85) (Gorgens-Ekermans & Herbert, 2013).

Innovative behaviour was measured using a self-report measure of innovative behaviour developed by Kleysen and Street (2001) (Appendix A). This scale is 14 items and is answered on a 6-point likert scale that ranges from one, which states 'never', to six, which states 'always'. These 14 items consisted of six innovative behaviours (opportunity exploration, application, generativity, championing and formative investigation). A high score indicates high levels of innovative behaviour, while a low score indicates low levels of innovative behaviour. Kleysen and Street (2001) preformed a factor analysis, which confirmed all the items of the scale loading on one factor. This indicated the suitability of using an overall score. This measure was found to have very high internal consistency reliability (0.94) and good construct

validity (Kleysen & Street, 2001). The innovative behaviour subscales were found to have moderate to high internal consistency reliabilities; opportunity exploration (0.72), generativity (0.72), formative investigation (0.80), championing (0.89) and application (0.79) (Kleysen & Street, 2001). This measure has also been validated by De Jong & Den Hartog (2008), and high internal consistency reliability (0.83) was found. This measure has also been used in South Africa (Steyn, 2019).

Innovative characteristics was measured using a self-report measure of innovative thinking developed by Barak, Watted and Haick (2019) (Appendix A). This measure was copyrighted. Thus, an email was sent to one of the authors, and permission was granted to use the scale (Appendix C). This scale is 13 items and is answered on a 6-point likert scale that ranges from one, which states 'strongly disagree' to six, which states 'strongly agree'. A high score indicates high levels of innovative thinking, while a low score indicates low levels of innovative thinking. This questionnaire has 4 subscales (observing, questioning, networking, and experimenting). The factor analysis confirmed that all the items loaded onto one construct, but the variables were still distinct (Barak et al., 2019). This scale was also found to have moderate internal consistency reliability (0.75) (Barak et al., 2019). The innovative characteristics subscales were found to have moderate to high internal consistency reliabilities; observing (0.79), questioning (0.73), networking (0.81) and experimenting (0.81).

The innovative characteristics scale has been the only scale developed for the Innovators DNA model. Thus, this research study used a factor analysis to test this scale in South Africa. It must also be noted that this measure developed by Barak et al (2019) was designed for students. Therefore, this research study adapted Barak et al (2019) questionnaire for the workplace by replacing certain words. For example, 'learning' was replaced by 'working'.

Although the innovator's thinking scale looked at the four aspects of the innovator's DNA model (observing, questioning, networking, and experimenting), associating was not included. Thus, an additional subscale was used to measure associating.

Associating was measured using the associating sub-scale of the modes of problem-solving scale that was developed by Jabri (1991) (Appendix A). This scale is 9 items

and is answered on a 6-point likert scale that ranges from one, which states 'extremely unlikely to enjoy' to six, which states 'extremely likely to enjoy'. A high score indicates high levels of associating, while a low score indicates low levels of associating. This measure has been used across a variety of studies and has been found to have high internal consistency reliability (0.83-0.87) (Jabri, 1991; Ko & Butler, 2006; Sung & Choi, 2012; Gilson & Shalley, 2004). This measure has also been validated and high internal consistency reliability was also found (Kim, Choi, Sung & Park, 2018).

All these measures used a multiple-choice, closed-ended format. This format requires participants to select from a pre-determined set of choices (White & McBurney, 2013). The advantage of this response format is that a large amount of data can be collected in a short space of time, and it is easier to analyze and interpret (White & McBurney, 2013). However, this response format has disadvantages, as the pre-determined set of choices may be restricted and not suitable for what the participants want to answer, and response bias may occur (White & McBurney, 2013). Nevertheless, this response format is the most appropriate for this research study because it is the most suitable for a quantitative study.

The procedure followed for data collection will be outlined below.

2.4 Procedure

This research study got ethical clearance from the Human Research Ethics Committee (non-medical) (MORG/19/001 1H) (Appendix F) before the data was collected. Once ethical clearance was obtained numerous organisations were contacted to invite them to participate in this study. The organisations were approached through email. The email included all relevant information about the study and a permission letter was attached for the organisations to sign if they wanted to participate in this study. Three organisations granted permission (Appendix D).

Once permission was granted, the HR Manager's distributed an email to all the employees to invite them to participate in this study. This email included a participant information sheet (Appendix E), which outlined the purpose of the study, what participation would entail, that participation was voluntary, that feedback of results

would be available, and there were no disadvantages or advantages for participating. The researcher and supervisor's contact details were also provided in case the participants wanted more information or had any questions. Lastly, a secure encrypted web link of the online questionnaire was provided, and it was made clear that completing the online questionnaire would be taken as informed consent.

At first, the online questionnaire was conducted through an Internet host website called 'Google forms'. However, this was not suitable for all the organisations, as their firewall blocked the link to the questionnaire. Thus, an alternative Internet host website called "Zoho Survey" was used. This survey platform was used because it was secure, encrypted, password protected, and cost effective.

The instruments (demographic questionnaire, PsyCap measure, innovative behaviour measure, innovative characteristics measure, and associating subscale measure) were then imported onto the survey's platform, and it was piloted to make sure the questions were appropriate. It was also made sure that each participant could only complete the questionnaire once. The questionnaire only took approximately 10 minutes to complete, and the link remained open until a sufficient sample was obtained (2 months). Once the data collection was completed, the URL of the questionnaire was closed, and the data was downloaded onto an Excel spreadsheet. The data was then cleaned and assessed for any missing information or errors. Once the data was assessed, it was exported to the statistical package for social sciences (SPSS) computer program (IBM version 25, 2017).

2.5 Data analysis

As discussed, once the data was cleaned it was exported into SPSS. The data that was analyzed first was gender, age, race, language, marital status, job level, job title, job industry, and tenure. This was done using descriptive statistics to provide an overview of the sample. Descriptive statistics are used to organize, summarize or describe data in a meaningful way (Holcomb, 2017). In descriptive statistics the nominal variables were analyzed using frequencies, while the variables that were treated as interval were analyzed by using means, standard deviation, minimum and maximum values.

Once descriptive statistics were established, this research study used an exploratory factor analysis to test the first research question to determine if the scales used to measure innovative characteristics form a coherent factor structure. It was necessary to run an exploratory factor analysis because only one study has examined the factor structure, and this scale has not been used in South Africa. In addition, this measure was previously used on students and had to be altered for employees.

An exploratory factor analysis uses a variable reduction technique to assess which items load on the respective factors (Wold, Esbensen & Geladi, 1987). This factor analysis was suitable for this study because the following assumptions were met: variables measured on a continuous level, sample size greater than 200, linearity, sampling adequacy, suitability for reduction, and no outliers (Field, 2009; Suhr, 2006). Linearity was tested using scatter plots. Sampling adequacy was tested using Kaiser-Meyer-Olkin (KMO) measure of sampling adequacy. This also tests whether there are linear relationships between the variables to determine if the data is suitable to use for a factor analysis (Williams, Onsman & Brown, 2010). The minimum requirement of sampling adequacy is a value of 0.5 (Hair, Anderson, Tatham & Black, 1995). The assumption of suitability for reduction was tested using Bartlett's test of sphericity. Bartlett's test of sphericity determines if there are adequate correlations to reduce a smaller number of components (Hair et al., 1995). This assumption is met when the p value (alpha) is less than 0.05 (significant) (Hair et al., 1995). Lastly, outliers were tested using boxplots

Once these assumptions were met an exploratory factor analysis was conducted using an Orthogonal Varimax rotation. This rotation is one of the most common techniques and it is used to simplify the unrotated factor-loading matrix (Pett, Lackey & Sullivan, 2003). The eigenvalues were then examined to determine the number of factors that were extracted. This technique involves analyzing the eigenvalues greater than one (Hauben, Hung, & Hsieh, 2017). However, this technique may result in under-factoring because it excludes factors that are just below one (Fabrigar, Wegener, MacCallum & Strahan, 1999). Therefore, it has been suggested to use a cut-off of 0.7 and examine Cattel's scree plot (Jolliffe, 1972) Cattel's scree plot includes the number of factors on the x-axis and the eigenvalues on the y-axis (D'agostino &

Russel, 2005). The point on the curve where the slope levels off indicates the number of factors that should be generated (D'agostino & Russel, 2005).

Once the factor structure was established, the reliability of the PsyCap scale, innovative behaviour scale and innovative characteristics scale was assessed using Cronbach Coefficient Alpha. Cronbach Alpha is a measure of internal consistency reliability by calculating how closely related a set of items are as a group (Tavakol & Dennick, 2011). This determines how well the items in the scale measure the same construct (Tavakol & Dennick, 2011). It is suggested that an acceptable Cronbach Alpha is between 0.60 and 0.70 (Bernstein, 1994; McKennel, 1970). Any scores lower than 0.60 are unacceptable and the instrument can be seen as meaningless (Tavakol & Dennick, 2011). Any score higher than 0.95 may suggest that the items are redundant (Bland & Altman, 1997). Cronbach Alpha is suitable to use when there is one administration of the instrument, when there are no alternative forms of the instrument, and when responses are scored on more than three values (Gregory, 2007; Huck, 2012). Cronbach alpha is suitable to use in this research study, as the instruments were only administrated once, and the instruments produced a score along a six-point scale.

A correlation technique was used to test the remaining research questions because it is the best test to determine if a relationship exists between PsyCap, innovative characteristics and innovative behaviour. This research study used the Pearson's product moment correlation. Pearson's product moment correlation is a measure of strength and direction of a linear relationship between two variables (Gregory, 2007). A result is significant when the p value (alpha) is less than 0.05. The Pearson correlation coefficient (r) ranges between -1 and +1 (Stangor, 2011). The closer the coefficient is to one, the stronger the relationship between the two variables (Stangor, 2011). This relationship can be either positive or negative (Stangor, 2011). Evans (1996) stated that a value of 0.00 to 0.19 is a very weak relationship, the value of 0.20 to 0.39 is a weak relationship, the value of 0.40 to 0.59 is a moderate relationship, the value of 0.60 to 0.79 is a strong relationship, and the value of 0.80 to 1 is a very strong relationship. It must be noted that correlation cannot establish temporal precedence (variable x precedes variable y) (Howell, 2008). Therefore, causality cannot be established.

Pearson's product movement correlation was appropriate to use in this research study because the following assumptions were met: random independent sampling, linearity, normality, variables are treated as interval, variables measured on a continuous level, randomly distributed, independence of observations, and homogeneity of variance (Huck, 2012). The normal distribution assumption was tested from Kurtosis and Skewness. Skewness measures the symmetry or lack of symmetry of the distribution of the scores (Kim, 2013). The data will be considered as normally distributed when the results are between +1.00 and -1.00 (DeCarlo, 1997). Kurtosis measures peak or flatness of the distribution (Kim, 2013). The data will be considered as normally distributed when the results are between +1 and -1 (DeCarlo, 1997). Normality can then be confirmed graphically on a histogram. The homogeneity of variance assumption was tested using Levene's test. Levene's test determines if there is an equal variance across the levels of the independent variable (Field, 2000). Homogeneity of variances are equal if the p value (alpha) is less than 0.05 (Field, 2000). Lastly, the linear relationship assumption was tested using scatter plots.

It must be noted that not all these assumptions can be tested statistically. For example, random sampling cannot be completely guaranteed in a research study of this nature. However, this assumption can be assumed because all the employees in the target population (working individuals) had access to an Internet connection and a computer. Thus, the employees had equal chance to contribute to this study. Independence of observations can also be assumed because all the employees could only complete the questionnaire once. Thus, there were only one set of scores that were sampled once. The variables in this study (PsyCap, innovative characteristics and innovative behaviour) can also be recognized as interval data, as with enough items people are likely to begin to intuitively treat the differences between each response as similar in distance.

Multiple regression was also used for the remaining research questions to determine if PsyCap and innovative characteristics can predict innovative behaviour. Multiple regression is used to predict variables based on two variables (Darlington & Hayes, 2017). This is based on two independent variables (predictor), and a dependent variable (outcome) (Darlington & Hayes, 2017). The independent variables predict the dependent variable when the results show a significant relationship (Darlington &

Hayes, 2017). A result is significant when the p value (alpha) is less than 0.05 (Darlington & Hayes, 2017). Multiple regression was appropriate to use in this research study because it met the following assumptions: linearity, independence of observations, normally distributed, independent variable and dependent variable that are continuous, no significant outliers, homoscedasticity and no multicollinearity (Field, 2000). Independence of observations was tested using Durbin-Watson. The Durbin-Watson determines if there is independence of observations by detecting the presence of autocorrelations (Field, 2000). The values in the range of 1.5 to 2.5 indicate independence of observations (Field, 2000). Homoscedasticity was tested using unstandardized and studentized residual plots. These residual plots help determine if the variables have the same finite variance around the regression line (Field, 2000). Lastly, multicollinearity was tested using the collinearity statistics of Tolerance. This determines if the variables are too closely related (Field, 2000). A value tolerance higher than 0.1 indicates no multicollinearity (Field, 2000).

2.6 Ethics

Permission to conduct this research study was obtained from the Human Research Ethics Committee (non-medical) (MORG/19/001 1H) (Appendix F). The requirements for ethical clearance were met. Once ethical clearance was obtained organisations were contacted to get permission to conduct the research study. Three organisations gave permission and signed a consent form (Appendix D). Ethics was also considered with regards to anonymity and confidentiality. Confidentiality was ensured by password protecting the data, and the data was only available to the researcher and the supervisor. To ensure anonymity, the employees' identification was not collected, and IP addresses were hidden. The storage of the data was also considered by password protecting the file and placing the research report on Wiredspace once completed. These ethical considerations were specified in the participation information sheet (Appendix E), and it was clearly stated that submitting the questionnaire would be considered as informed consent.

The participant information sheet also clearly described the purpose of the study. This informed the employees what the study was about before they participated. The participant information sheet also stated that the employees could withdraw from the study at any time up until submitting the questionnaire. The names and numbers of

the researchers were also provided for participants that had any further questions or wanted the results of the study. Before feedback was given to the organisations and the employees that requested it, they were informed that the findings would be presented in a summary report that has general trends. This ensured that no responses could be identified. Lastly, the number of the ethics committee was also provided in case the participants had any ethical concerns.

Chapter 3: Results

This chapter presents statistical results including, frequencies, descriptive statistics, exploratory factor analysis, reliability analysis, Pearson's correlation, and multiple regression. All numbers throughout this chapter have been rounded off to two decimal places.

3.1 Frequencies

As indicated in Table 1, most of the participants were female (77.5%) with a mean age of 37. The majority of the sample were White (39.8%), followed by African (34%), Coloureds (14.8%), and Indians (9.9%). Most of the participants indicated that their home language is English (45.2%), followed by Afrikaans (17.1%), isiZulu (7.4%), and isiXhosa (6%). Most of the participants were in the tourism industry (89.7%), followed by the automotive industry (10.3%). The majority of participants had the job title of 'Travel Consultant' (40.4%), followed by 'Debtors controller' (7%). Most of the participants indicated that they are in an intermediate level (46.4%), while the least number of participants indicated that they were in an executive level (1.6%). Most of the participants have worked at the organisation between one and five years (41.7%), and the least number of participants have worked between eight and ten years (7.8%).

Table 1
Descriptive data for sample

Variable	Frequency	Percentage
Gender*		
Male	102	21
Female	376	77.5
I prefer not to say	4	0.8
Other	2	0.4
Age*		
20 & younger	3	0.6
21-30	102	22.1
31-40	188	38.8
41-50	132	27.2
51-60	34	7
60 & older	10	2.1
Race*		
African	165	34
Coloured	72	14.8
Indian	48	9.9
White	193	39.8
Other	5	1
Marital status*		
Married	224	46.2
Divorced	46	9.5
Unmarried	211	43.5
Job level*		
Entry level	72	14.8
Intermediate	225	46.4
Junior management	54	11.1
Middle management	100	20.6
Upper management	15	3.1
Executive	8	1.6
Tenure: position*		
Less than a year	72	14.7
More than a year, less than 5 years	153	31.4
More than 5 years, less than 8 years	62	12.8
More than 8 years, less than 10 years	48	9.7
10 years or more	44	29.3
Tenure: organisation*		
Less than a year	89	18.2
More than a year, less than 5 years	203	41.7
More than 5 years, less than 8 years	70	14.4
More than 8 years, less than 10 years	38	7.8
10 years or more	83	16.9

*Note: * not all participants answered this item*

3.2 Descriptive statistics

Descriptive statistics were used to calculate the mean, standard deviation, minimum values and maximum values of the variables that were treated as interval. Skewness and Kurtosis were also calculated to test if the variables were normally distributed to determine if a non-parametric or parametric test should be used for the correlation and regression.

Table 2

Descriptive statistics, skewness and kurtosis coefficients

Variable	N	Min	Max	Mean	Standard Deviation	Skewness Coefficient	Kurtosis Coefficient
PsyCap	485	1	6	4.74	0.52	-0.11	0.62
Self-efficacy	485	2	6	4.89	0.68	-0.16	-0.24
Hope	485	1	6	4.80	0.68	-0.15	0.23
Optimism	485	1	6	4.53	0.63	-0.27	0.38
Resilience	485	1	6	4.71	0.61	-0.23	0.30
Innovative behaviour	485	1	6	4.08	0.97	-0.64	-0.28
Innovative characteristics	485	1	6	4.09	0.82	-0.37	0.42
Observing	485	1	6	4.45	0.89	-0.37	0.36
Questioning	485	1	6	4.26	1.03	-0.54	0.39
Networking	485	1	6	3.91	1.14	-0.37	-0.18
Experimenting	485	1	6	4.11	1.03	-0.31	0.39
Associating	485	1	6	4.16	0.81	-0.42	0.60

As seen from Table 2, PsyCap had a mean of 4.74 and a standard deviation of 0.52. Thus, most of the participants felt that they 'somewhat agree' that they have a sense of self-efficacy, hope, optimism, and resilience. Innovative behaviour had a mean of 4.08 and a standard deviation of 0.97. Similarly, innovative characteristics had a mean of 4.09 and a standard deviation of 0.82. Thus, most of the participants felt that they 'somewhat agree' that they produce innovative behaviour and innovative characteristics. Lastly, associating had a mean of 4.16 and a standard deviation of

0.81. Thus, most participants felt that they are 'slightly more likely to enjoy' associating.

Initially Total PsyCap had a Skewness of -1.08 and Kurtosis of 4.23, and Hope had a Skewness of -1.11 and Kurtosis of 3.54. This indicated that Total PsyCap and Hope were not normally distributed. Thus, a log transformation was conducted, and it resulted in the coefficients falling in the required range of -1 and +1 (Table 2). Normality was also examined through histograms (Appendix G). The histograms indicated that the variables were approximately normally distributed.

Before conducting the statistical analysis, the factor structure was determined.

3.3 Factor Analysis

Before the exploratory factor analysis was undertaken, the assumptions of linearity, sampling adequacy, suitability for reduction and outliers were tested. Linearity was tested using scatter plots (Appendix H). These scatter plots showed that the data was approximately linear. Sampling adequacy was tested using Kaiser-Meyer-Olkin (KMO) measure of sampling adequacy. The results indicated a high value of KMO (0.93) (see Table 3), as the value is close to one (Hair, Anderson, Tatham & Black, 1995). The assumption of suitability for reduction was tested using Bartlett's test of sphericity. This test was significant ($p < 0.05$) (see Table 3), indicating that the data was suitable for reduction. Lastly, outliers were tested using boxplots (Appendix I). Although outliers were identified, none of these outliers were extreme. Thus, it is unlikely that the factor analysis would have been affected by these outliers.

Table 3

KMO and Bartlett's test

KMO	**Bartlett's test**	
0.93	Approx. Chi-Square	6388.96
	df	231
	Sig	.000

Once the assumptions were tested and met, an exploratory factor analysis with varimax rotation was conducted using the innovative characteristics scale (13 items) and the associating scale (9 items). The results of the eigenvalues from the factor analysis is presented in Table 4 and Figure 2.

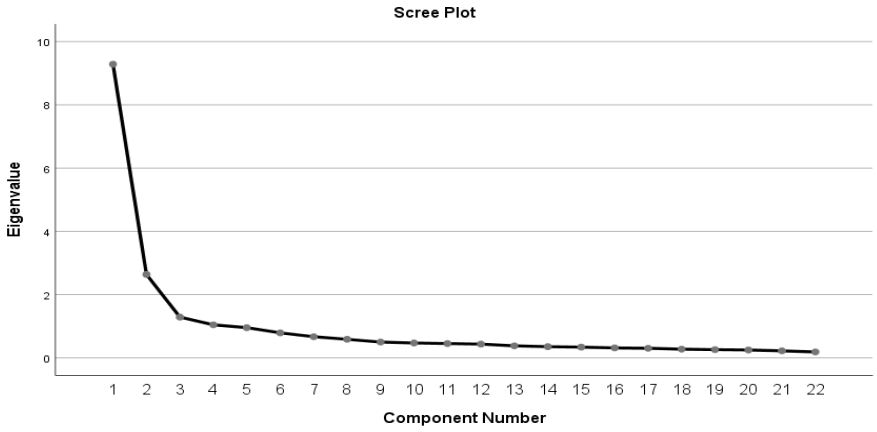
Table 4

Eigenvalues and proportion of variance

	Eigen values	Variance
Factor 1	9.28	42.19
Factor 2	2.64	11.99
Factor 3	1.29	5.86
Factor 4	1.05	4.75
Factor 5	0.96	4.34

Figure 2

Exploratory factor analysis scree plot



Four factors were extracted based on the assumption that eigenvalues must be greater than one (Kaiser, 1971). This is shown in the scree plot (Figure 2) and Table 4. As seen, factor 1 accounted for the largest portion of variance (42.19%), followed by factor 2 (11.99%), factor 3 (5.86%), and factor 4 (4.75%). Table 5 shows how these factors were extracted.

Table 5

Factor structure of innovative characteristics

	Factor 1	Factor 2	Factor 3	Factor 4
Q1: Observing	0.65			
Q2: Observing	0.69			
Q3: Observing	0.63			
Q1: Questioning	0.75			
Q2: Questioning	0.74			
Q3: Questioning	0.68			
Q1: Networking		0.79		
Q2: Networking		0.76		
Q3: Networking		0.61		
Q4: Networking		0.47	0.62	
Q1: Experimenting			0.74	
Q2: Experimenting			0.73	
Q3: Experimenting			0.75	
Q1: Associating				0.66
Q2: Associating				0.74
Q3: Associating				0.71
Q4: Associating				0.65
Q5: Associating				0.79
Q6: Associating				0.72
Q7: Associating				0.78
Q8: Associating				0.74
Q9: Associating				0.72

As seen in Table 5, the factors that were extracted indicated that observing and questioning formed one factor structure. Networking (item 1-3) formed the second factor structure. Networking (item 4) and experimenting formed the third factor structure and associating formed the fourth factor structure. This factor structure was not in line with Barak et al (2019) study because each innovative characteristic had its own factor (Observing, Questioning, Networking, Experimenting). However, as seen

in Table 4, the fifth factor was very close to the eigenvalue of 1. A visual inspection of Figure 2 also shows that factor five was very close to factor four (1.045). Therefore, it was decided to extract five factors, as this was in line with Jolliffe (1972) who suggested that Kaiser's (1971) criterion of greater than one is too large and using a cut off of 0.7 is sufficient. The revised factor structure is shown in Table 6.

Table 6

Revised factor structure of innovative characteristics

	Factor 1	Factor 2	Factor 3	Factor 4	Factor 5
Q1: Associating	0.66				
Q2: Associating	0.74				
Q3: Associating	0.71				
Q4: Associating	0.65				
Q5: Associating	0.79				
Q6: Associating	0.72				
Q7: Associating	0.78				
Q8: Associating	0.74				
Q9: Associating	0.72				
Q4: Networking		0.70			
Q1: Experimenting		0.73			
Q2: Experimenting		0.75			
Q3: Experimenting		0.75			
Q1: Observing			0.73		
Q2: Observing			0.79		
Q3: Observing			0.76		
Q1: Questioning				0.72	
Q2: Questioning				0.81	
Q3: Questioning				0.75	
Q1: Networking					0.81
Q2: Networking					0.79
Q3: Networking					0.56

As seen in Table 6, the factor structure is in line with Barak et al (2019) study, as each innovative characteristic has its own factor (Observing, Questioning, Networking, Experimenting). However, item 4 of networking was extracted on the experimenting scale. Therefore, this research study included item 4 of the networking scale with the experimenting scale. Once the factor structure was established, internal consistency reliability of each instrument was measured.

3.4 Reliability

In the table below (Table 7), the Cronbach alpha of each scale and subscale are presented.

Table 7

Internal consistency reliability

Variable	Cronbach Alpha
Psychological Capital	0.90
Self-efficacy	0.82
Hope	0.83
Optimism	0.71
Resilience	0.68
Innovative behaviour	0.95
Innovative characteristics	0.93
Observing	0.87
Questioning	0.82
Networking	0.84
Experimenting	0.88
Associating	0.90

Psychological capital had an excellent internal consistency (0.90). The subscales of PsyCap varied from good (0.83) to acceptable internal consistency (0.68). Although a preferred Cronbach Alpha is 0.70, a Cronbach Alpha of 0.60 is an acceptable level of internal consistency within the Social Sciences (McKennel, 1970).

Innovative behaviour had an acceptable high internal consistency (0.95). Innovative characteristics had an excellent internal consistency (0.93), and the subscales of innovative characteristics all had good internal consistency. These results indicate that the scales and subscales of the instruments had acceptable to excellent internal reliability consistency. Thus, the items in each scale measure the same construct (Tavakol, & Dennick, 2011).

3.5 Pearson's Correlation

Once normality and internal reliability consistency was established, the assumptions of Pearson's correlation were tested. The data met all the assumptions of Pearson's correlation, as the data was normally distributed, it was linear (Appendix H), it had no extreme outliers (Appendix I), and homogeneity of variance was met. Homogeneity of variance was tested using Levene's test and a significant result was found ($p < 0.05$). Therefore, there is an equal variance across the levels of the independent variables. Pearson correlation was used both to determine the independence of the subscales of PsyCap and innovative characteristics, and to test the strength of the relationships between PsyCap, innovative behaviour and innovative characteristics. The results of the correlations are shown in Table 8.

Table 8

Pearson's correlation for subscales of PsyCap and Innovative behaviour

Subscale	Self-efficacy	Hope	Optimism	Resilience	Total PsyCap	Innovative behaviour
Self-efficacy	1	0.63**	0.48**	0.53**		
Hope	0.63*	1	0.64**	0.55**		
Optimism	0.48**	0.64**	1	0.51**		
Resilience	0.53**	0.55**	0.51**	1		
Total PsyCap	0.82**	0.87**	0.79**	0.78**	1	
Innovative behaviour	0.48**	0.45**	0.41**	0.33**	0.52**	1

** *Correlation is significant at the 0.01 level (2 tailed)*

As seen in Table 8, all the correlation coefficients are positive significant correlations that ranged from a strength of strong to moderate (Evans, 1996). Self-efficacy had a strong correlation with hope (0.63), and a moderate correlation with optimism (0.48) and resilience (0.53). Hope had a strong correlation with optimism (0.64) and a moderate correlation with resilience (0.55). Lastly, Optimism had a moderate correlation with resilience (0.51). These correlations are in line with the literature, as while these constructs are conceptually distinct, they have underlying links (Sweetman et al., 2011).

Psychological capital had a positive significant moderate correlation with innovative behaviour (0.52). This suggests that the more PsyCap an individual has, the more innovative behaviour they will have. The correlations between each PsyCap construct ranged from moderate to weak correlations. Self-efficacy (0.48), hope (0.45) and optimism (0.41) had moderate positive correlations with innovative behaviour, while resilience (0.33) had a weak correlation. Thus, the more self-efficacy, hope, optimism and resilience an individual has, the more innovative behaviour they will have.

The effect sizes (Table 9) for innovative behaviour and PsyCap was also calculated. The effect size determines the magnitude of the relationships (Rubin, 2009). The effect sizes indicated that self-efficacy explains 23% of the variability in innovative behaviour, hope explains 20%, optimism explains 17%, resilience explains 11%, and total PsyCap explains 27% of the variability in innovative behaviour.

Table 9

Effect sizes for Innovative behaviour and PsyCap

Subscale	Effect size
Self-efficacy	0.23
Hope	0.20
Optimism	0.17
Resilience	0.11
Total PsyCap	0.27

Table 10

Pearson's correlation for subscales of Innovative characteristics and Innovative behaviour

Subscale	Observing	Questioning	Networking	Experimenting	Associating	Total Innovative characteristics	Innovative behaviour
Observing	1	0.59**	0.55**	0.61**	0.43**		
Questioning	0.59**	1	0.50**	0.57**	0.45**		
Networking	0.55**	0.50**	1	0.63**	0.43**		
Experimenting	0.61**	0.57**	0.63**	1	0.50**		
Associating	0.43**	0.45**	0.43**	0.50**	1		
Total Innovative characteristics	0.75**	0.74**	0.75**	0.82**	0.83**	1	
Innovative behaviour	0.64**	0.55**	0.57**	0.68**	0.45**	0.70**	1

*** Correlation is significant at the 0.01 level (2 tailed)*

As seen in Table 10, all the correlation coefficients are positive significant correlations that ranged from a strength of strong to moderate. Observing had a strong correlation with experimenting (0.61), and a moderate correlation with questioning (0.59), networking (0.55) and associating (0.43). Questioning had a moderate correlation with networking (0.50), experimenting (0.57) and associating (0.45). Networking had a strong correlation with experimenting (0.63), and a moderate correlation with associating (0.43). Lastly, experimenting had a moderate correlation with associating (0.50). These correlations are also in line with the literature, as Barak et al (2019) stated that the constructs of innovative characteristics are distinct but related.

Innovative characteristics was found to have strong positive significant correlation with innovative behaviour (0.70). Thus, the more innovative characteristics an individual has, the more innovative behaviour they will have. The correlations between each innovative characteristic and innovative behaviour ranged from strong to moderate. Observing (0.64) and experimenting (0.68) had a strong correlation with innovative behaviour, while questioning (0.55), networking (0.57) and associating (0.45) had a moderate correlation with innovative behaviour.

The effect sizes of innovative behaviour and innovative characteristics are shown in Table 11. Observing explains 41% of the variability of innovative behaviour, questioning explains 30%, networking explains 32%, experimenting explains 42%, associating explains 20% and total innovative characteristics explains 49% of the variability of innovative behaviour.

Table 11

Effect sizes for Innovative behaviour and Innovative characteristics

Subscale	Effect size
Observing	0.41
Questioning	0.30
Networking	0.32
Experimenting	0.42
Associating	0.20
Total Innovative characteristics	0.49

Table 12

Pearson's correlation for subscales of PsyCap and Innovative characteristics

Subscale	Observing	Questioning	Networking	Experimenting	Associating	Total Innovative characteristics
Self-efficacy	0.45**	0.39**	0.38**	0.39**	0.33**	0.48**
Hope	0.67*	0.37	0.38**	0.41**	0.29	0.46**
Optimism	0.45**	0.29**	0.40**	0.38**	0.31**	0.45**
Resilience	0.37**	0.30**	0.30**	0.28**	0.33**	0.40**
Total PsyCap	0.53**	0.42**	0.45**	0.45**	0.39**	0.55**

*** Correlation is significant at the 0.01 level (2 tailed)*

As seen in Table 12, all the correlation coefficients are positive significant correlations that ranged from a strength of strong to weak. Self-efficacy (0.48), hope (0.46), optimism (0.45) and resilience (0.40) had moderate correlations with total

innovative characteristics. This suggests that as an individual has more self-efficacy, hope, optimism, and resilience they should have more innovative characteristics.

The correlations of self-efficacy and each innovative characteristic ranged from moderate to weak. Self-efficacy had a moderate correlation with observing (0.45), and a weak correlation with questioning (0.39), networking (0.38), experimenting (0.39) and associating (0.33). The correlations of hope and each innovative characteristic ranged from strong to weak. Hope had a strong correlation with observing (0.67), a moderate correlation with experimenting (0.41), and a weak correlation with questioning (0.37), networking (0.38) and associating (0.29). The correlations of optimism and each innovative characteristic ranged from moderate to weak. Optimism had a moderate correlation with observing (0.45) and networking (0.40), and a weak correlation with questioning (0.29), experimenting (0.38) and associating (0.31). Resilience had weak correlations with observing (0.37), questioning (0.30), networking (0.30), experimenting (0.28) and associating (0.33). Lastly, Total PsyCap had moderate correlations with observing (0.53), questioning (0.42), networking (0.45) and experimenting (0.45), and a weak correlation with associating (0.39).

The effect sizes of total innovative characteristics and PsyCap are shown in Table 13. Self-efficacy explains 23% of the variability of innovative characteristics, hope explains 21%, optimism explains 20%, resilience explains 16%, and total PsyCap explains 30% of the variability of innovative characteristics.

Table 13

Effect sizes for Total Innovative characteristics and PsyCap

Subscale	Effect size
Self-efficacy	0.23
Hope	0.21
Optimism	0.20
Resilience	0.16
Total PsyCap	0.30

3.5 Multiple regression

Once the correlations for PsyCap, innovative characteristics and innovative behaviour were determined, a regression analysis was conducted. However, before a multiple regression was conducted, the assumptions of independence of observations, linearity, homoscedasticity, no multicollinearity, outliers, and normality were tested. Independence of observations was tested using the Durbin-Watson statistic (Table 14). The Durban-Watson statistic for each model was acceptable, as it is suggested that values in the range of 1.5 to 2.5 indicate independence of observations (Field, 2009). In multiple regression it is suggested that linearity should be tested by plotting the unstandardized predictive values against the studentized residuals and using partial regression plots. Both plots indicated that the data is approximately linear (Appendix J). Homoscedasticity was also tested using the unstandardized and studentised residual plots. The results showed there was homoscedasticity (Appendix J). Multicollinearity was tested using the collinearity statistics of Tolerance. The results indicated that all the variables had a tolerance value higher than 0.1, which means that there is no multicollinearity (Table 15). As seen previously, there were no extreme outliers (Appendix I). This was further confirmed by determining if there are any studentised residuals above 3. Lastly, the data was normally distributed as seen with skewness, kurtosis and histograms (Appendix G). This was also confirmed by looking at the P-P plot of Regression Standardized Residual (Appendix J).

Table 14

Durban Watson analysis

Regression Model	Durban Watson Statistic
PsyCap subscales	1.75
Innovative characteristics subscales	1.89
PsyCap subscales and Innovative characteristics subscales	1.89
Total PsyCap and Total Innovative characteristics	1.79

Table 15

Collinearity statistics

Variables	Tolerance values
Observing	0.51
Questioning	0.57
Networking	0.54
Experimenting	0.47
Associating	0.69
Self-efficacy	0.55
Hope	0.43
Optimism	0.56
Resilience	0.61
Total PsyCap	0.69
Total Innovative characteristics	0.69

Once the assumptions of multiple regression were tested and met, four regression analyses were calculated with PsyCap and innovative characteristics as the independent variables, and innovative behaviour as the dependent variable. These variables were entered using a 'forced-entry' approach.

Table 16

PsyCap subscales model

Df	F	Sig (p-value)	Adjusted R^2
4	47.71	0.00	0.28
480			

Table 17

Coefficients of PsyCap subscales

	B	Sig
(Constant)	2.39	0.00
Self-efficacy	0.86	0.00
Hope	0.44	0.01
Optimism	0.58	0.00
Resilience	-0.009	0.96

As seen in Table 16, the p-value is smaller than 0.05. Therefore, the regression model of PsyCap subscales is statistically significant, F (4, 480) = 47.71, p<0.05. Thus, this regression model significantly predicts innovative behaviour (i.e it is a good fit for the data). This model accounts for 28% (small effect size) of the variance of innovative behaviour (Field, 2009).

In Table 17, we can see which PsyCap subscales statistically significantly predict innovative behaviour. It was found that self-efficacy, hope and optimism were statistically significant (p< 0.05). Therefore, for every one-unit increase in self-efficacy, hope, and optimism, there is a predictive increase in innovative behaviour.

Table 18

Innovative characteristic subscales model

Df	F	Sig	Adjusted R^2
5 479	121.99	0.00	0.55

Table 19

Coefficients of Innovative characteristics subscales

	B	Sig
(Constant)	-0.06	0.81
Observing	1.39	0.00
Questioning	0.47	0.22
Networking	0.64	0.00
Experimenting	1.34	0.00
Associating	0.13	0.85

As seen in Table 18, the p-value is smaller than 0.05. Therefore, the regression model of innovative characteristics subscales statistically significantly predicts innovative behaviour, F (5, 479) = 121.99, p<0.05. This model accounts for 55% (large effect size) of the variance of innovative behaviour (Field, 2009).

In Table 19, we can see that observing, networking, and experimenting were statistically significant ($p<0.05$). Therefore, for every one-unit increase in observing, networking, and experimenting there is a predictive increase in innovative behaviour

Table 20

PsyCap subscales and Innovative characteristic subscales Model

Df	F	Sig (p-value)	Adjusted R^2
9	72.69	0.00	0.57
475			

Table 21

Coefficients of PsyCap subscales and Innovative characteristic subscales

	B	Sig
(Constant)	-0.25	0.41
Self-efficacy	0.38	0.00
Hope	0.12	0.36
Optimism	0.09	0.48
Resilience	-0.09	0.49
Observing	1.17	0.00
Questioning	0.39	0.05
Networking	0.52	0.01
Experimenting	1.28	0.00
Associating	0.11	0.16

As seen in Table 20, the p-value is smaller than 0.05. Therefore, the regression model of PsyCap and innovative characteristics subscales is statistically significant, $F (9, 475) = 72.69$, $p< 0.05$. Thus, this regression model statistically significantly predicts innovative behaviour. This model accounts for 57% (a large effect size) of the variance of innovative behaviour (Field, 2009).

Table 21 indicates that self-efficacy was the only PsyCap construct that had a predictive effect on innovative behaviour. However, the innovative characteristics

subscales of observing, networking and experimenting were also found to have a predictive effect on innovative behaviour.

Table 22

Total PsyCap and Total Innovative characteristics model

Df	F	Sig (p-value)	Adjusted R^2
2	259.31	0.00	0.52
482			

Table 23

Coefficients of Total PsyCap and Total Innovative characteristics

	B	Sig (p-value)
(Constant)	-0.32	0.23
Total PsyCap	0.18	0.00
Total Innovative characteristics	0.57	0.00

As seen in Table 22, the p-value is smaller than 0.05. Therefore, the regression model of PsyCap and innovative characteristics is statistically significant, F (2, 482) = 259.31, p< 0.05. Thus, this regression model significantly predicts innovative behaviour. This model accounts for 52% (a large effect size) of the variance of innovative behaviour (Field, 2009).

Table 23 indicates that PsyCap and innovative characteristics are both significant in predicting innovative behaviour. Thus, for every one-unit change in PsyCap and innovative characteristics there is a predicted increase in innovative behaviour.

3.6 Summary of Results

The results revealed that the scales had acceptable internal consistency reliability and that the data was normally distributed. The exploratory factor analysis revealed that the factor structure was in line with Barak et al (2019) study on innovative characteristics, except for one item of networking. The correlations of PsyCap, innovative behaviour and innovative characteristics were all significant ranging from

a moderate to high strength. Lastly, the multiple regression analysis revealed that PsyCap and innovative characteristics accounted for 52% of the variance of innovative behaviour.

Chapter 4: Discussion

The current study explored the relationship between PsyCap, innovative characteristics and innovative behaviour. This chapter will discuss the results of each research question and link these results to other studies to contribute or challenge the findings.

4.1 Factor structure of Innovative Characteristics measure

The results of the factor analysis were in line with Barak et al (2019) study except for one item of networking that fell part of experimenting. This item stated, "I participate in diverse professional forums". This item may have been problematic for a South African context, as some people may not know what is meant by a professional forum because this notion is not very common in South Africa. Thus, the participants may have not answered this question in accordance to its meaning. Therefore, this may have hampered the results, which in turn affected the factor analysis.

The results of the factor analysis also revealed that the scale used for associating (Jabri, 1991) formed one coherent factor structure with Barak et al (2019) innovative characteristics scale (observing, questioning, networking and experimenting). This was consistent with the reliability analysis. The reliability analysis found an excellent internal consistency reliability. Therefore, associating could be considered to form part of innovative characteristics.

4.2 Psychological Capital and Innovative Behaviour

The results of total PsyCap revealed that PsyCap was moderately correlated with innovative behaviour and it was found to predict innovative behaviour. This is consistent with empirical evidence that has shown PsyCap to be a strong predictor of organisational behaviour (Luthans, 2007). This is also in line with Avey and his colleagues (2010), as they acknowledged that individuals with high PsyCap should have higher perseverance to implement innovative ideas. These results are consistent with Ziyae et al (2015) because they found that PsyCap was moderately correlated with innovative behaviour and it predicted innovative behaviour. This result is also consistent with Sweetman et al (2011), as they asserted that individuals with high PsyCap are more likely to exhibit innovative behaviour than their low PsyCap

counterparts. However, this was not found in Abbas and Raja's (2015) study. Abbas and Raja (2015) found a weak correlation with PsyCap and innovative behaviour. This may be due to Abbas and Raja (2015) sample of employees that are government workers and bank workers. These workers may be less innovative because their work does not require as much innovation as opposed to the travel industry (which is the majority of the sample of this research study). This concern was also addressed by Abbas and Raja (2015).

The results based upon the r^2 correlations revealed that total PsyCap explained the most variance in innovative behaviour (27%) compared to each PsyCap construct. This is consistent with Luthans's (2007) and his colleagues', as they found PsyCap to predict job outcomes better than its individual components. This is also in line with Ziyae et al (2015), Zubair and Kamal (2015), and Abbas and Raja (2015) study, as they found that total PsyCap predicted innovative behaviour better than each construct. Each PsyCap construct was also found to be significantly correlated with innovative behaviour. The first PsyCap construct that will be discussed is self-efficacy.

Self-efficacy moderately correlated with innovative behaviour and it was found to predict innovative behaviour. This is consistent with the conceptual understanding of self-efficacy. Self-efficacious individuals believe in their abilities and do not give up (Bandura, 1977). The confidence that comes with self-efficacy motivates individuals to take on challenging tasks. Therefore, self-efficacious individuals are more likely to be innovative, as they are persevering and are willing to take risks to implement innovative ideas. This significant relationship is also in line with previous studies (Kumar & Uzkurt. 2011; Ziyae et al., 2015). However, Kumar and Uzhurt (2011) only found a weak significant correlation of self-efficacy and innovative behaviour. Similarly, Ziyae et al (2015) also found a weak significant relationship, and they found that self-efficacy did not predict innovation. These differences in findings may be due to the differences in the sample. Ziyae et al (2015) study had a sample of 100 IT (information technology) employees, while this research study had 485 employees that was mainly based in the tourism industry. Thus, these differences in findings

could be attributed to the IT industry exhibiting less self-efficacy than the tourism industry because the IT industry involves a process of elimination to be successful (Aksoy & DeNardis, 2008). In the IT industry the process of elimination involves rejecting each possible choice until one solution is found. This could make the employees less confident in their abilities when they struggle to find a solution (Aksoy & DeNardis, 2008).

The findings of this research study may have also differed from Kumar and Uzkhurt (2011) study because they measured consumer innovation, as oppose to employee innovation. This can explain the differences in findings, as Kumar and Uzkhurt (2011) measured a different construct to this study. The sample size could also explain the differences in results, as the larger the sample size the more accurate the results (Faber & Fonseca, 2014).

Optimism was also found to have a moderate significant correlation with innovative behaviour, and it was found to predict innovative behaviour. This is in line with the conceptual understanding of optimism. Optimistic individuals are known to use effective problem-solving strategies, take risks, and produce a self-fulfilling prophecy (Le et al., 2015; Sweetman et al., 2010). Thus, optimistic individuals are more likely to be innovative, as they persevere when looking for innovative ways to solve problems because they have optimistic expectations when faced with obstacles (Rego et al., 2012). The significant relationship that was found is also consistent with the research on optimism and creativity. For example, Rego et al (2012) and Le et al (2015) found that optimism directly predicted creativity. However, the results are not consistent with Ziyae et al (2015) study that looked at optimism and innovation. Similar to self-efficacy, Ziyae et al (2015) found a weak correlation of optimism and innovative with no predictive effect. These findings can also be attributed to the sample of Ziyae et al (2015) study, as employees in the IT industry may be less optimistic because of the nature of the IT industry as previously discussed (Aksoy & DeNardis, 2008).

Hope was found to have a moderate significant correlation with innovative behaviour, and it was found to predict innovative behaviour. This is in line with the conceptual understanding of hope. Hopeful individuals are risk-takers, independent thinkers, and use alternative pathways when faced with obstacles (Luthans et al., 2007; Rego et al., 2009). Therefore, hopeful individuals are more likely to be innovative, as they can generate novel ideas from different angles and go against the norm. This is consistent with the studies on hope and creativity. For example, Rego et al (2009) found that hope predicted useful ideas, ideas championing and novel ideas. The significant moderate correlation of hope and innovative behaviour is also consistent with Ziyae et al (2015), as they also found a moderate correlation. However, Ziyae et al (2015) found that hope did not predict innovative behaviour, which is not consistent with the findings of this study. These differences in findings could be attributed to Ziyae et al (2015) sample of 100 IT employees.

Resilience was found to have a weak significant correlation with innovative behaviour, and it did not predict innovative behaviour. Although a significant correlation was found, this result was unexpected because the correlation was weak, and no predictive effect was found. This is not in line with Ziyae et al (2015) study, as they found that resilience had a moderate correlation with a significant predictive effect on innovative behaviour. These differences in findings may be due to the differences in sample. Ziyae et al (2015) collected data from the IT industry, while this research study collected data mainly in the tourism industry. Employees in IT may need to be more resilience than the employees in the tourism industry, as they constantly monitor mistakes and need to "bounce" back and fix those mistakes (Taras, Bennet & Townsend, 2009).

The non-predictive effect of resilience on innovative behaviour could also be explained by the possibility that the variance of resilience was taken up by the other three PsyCap constructs (self-efficacy, hope, and optimism). Research has found that self-efficacy, hope and optimism can act as pathways to bring about resilience (Luthans et al., 2006). Therefore, it can be said that self-efficacy, hope and optimism hold an element of resilience. For example, self-efficacious individuals' ability to believe in oneself can bring about resilience, as despite setbacks a self-efficacious individual will preserve. In a similar way an optimistic individual will also preserve

because of their optimistic expectations. Lastly, hopeful individuals can be resilient, as they are able to come up with alternative pathways when they are faced with challenges. Therefore, self-efficacious, optimistic and hopeful individuals are unlikely to give up in challenging situations, which enables them to 'bounce back'.

An alternative explanation for this unexpected result could be due to the nature of resilience. Although the conceptual understanding of resilience can be linked to innovative behaviour because of the perseverant nature of resilience, resilient individuals may not take as much risks as the other PsyCap constructs (Luthans et al., 2006). Resilient individuals tend to reduce risks and increase their assets to sustain their resiliency (Luthans et al., 2006). Therefore, resilient individuals are unlikely to take as many risks as the other PsyCap constructs. This can explain the non-predictive effect of resilience on innovative behaviour because risk-taking has been found to be key for innovative behaviour (Kanter, 1983).

4.3 Innovative Characteristics and Innovative Behaviour

Total innovative characteristics was found to have a strong correlation with innovative behaviour, and it was found to predict innovative behaviour. This is in line with Dyer et al (2009), as they found an association between innovative characteristics and innovative individuals. This is consistent with the literature, as studies have shown that an innovative mental process can stimulate the realization of creative ideas and outcomes (Anderson, Potocnik & Zhou, 2014; Patternson, Kerrin & Gatto-Roissard, 2009).

The results also indicated that innovative characteristics accounted for the most variance of innovative behaviour (49%) compared to each innovative characteristic construct. Therefore, like PsyCap, innovative characteristics predicts innovative behaviour better than its individual components. A discussion of each innovative characteristic and innovative behaviour will be outlined. The first construct that will be discussed is observing.

Observing was found to have a strong correlation with innovative behaviour and it was found to predictive innovative behaviour. This is consistent with Dyer et al (2009) study, as they also found observing to influence an individual's innovation.

Although there has only been one study that has looked at innovative characteristics, this relationship can be understood conceptually from the literature of innovative behaviour. Studies have found that in order to be innovative, one needs to first recognize the problem (Kanter, 1988; Scott & Bruce, 1994). Thus, observing is important for innovative behaviour, as without observing individuals will struggle to identify small details to understand the problem and find new ways of doing things (Kanter, 1988; Dyer et al., 2009).

Questioning was found to have a moderate correlation with innovative behaviour, but it did not predict innovative behaviour. This non predictive effect could be attributed to questioning not being a key factor for innovative behaviour because questioning is not directly involved in the innovative process of problem recognition, generating ideas, building support and implementation (Kanter, 1988). However, questioning was still found to be moderately correlated with innovative behaviour. Thus, even though questioning may not be directly involved in creating innovative behaviour, it may still contribute to innovation. For example, studies have shown that when individuals are more curious and ask more questions to challenge their assumptions it allows for exploration of novel ideas (Kashdan, Rose & Finchman, 2004). Questioning individuals are also more open to new ideas and enjoy the process of discovering and thinking (Mussel, 2013). Therefore, questioning may enhance innovative behaviour, rather than predict innovation, as it permits individuals to discover ideas from different angles and challenge the norm.

Networking was also found to have a moderate correlation with innovative behaviour, and it was found to predict innovative behaviour. This is consistent with the literature. Studies have shown that a key process of innovative behaviour is idea promotion (Kanter, 1988; Mumford, Scott, Gaddis & Strange, 2002). Individuals need to be able to build a network of diverse people that can contribute to novel ideas, and give approval of those ideas (Kanter, 1988). Therefore, networking is important for innovative behaviour, as without networking individuals will not gain approval to produce those innovative ideas, and individuals will be unable to test the innovativeness of their ideas (Kanter, 1998; Dyer et al., 2009).

Experimenting was found to have a strong correlation with innovative behaviour, and it was found to predict innovative behaviour. This is in line with the literature. Studies have shown that innovative behaviour involves evaluating and experimenting with novel ideas to produce the most innovative outcome (Amabile, 1998). Individuals are also more innovative when they can take risks while experimenting with new ideas. (Kanter, 1983; Howell & Higgins, 1990). Therefore, experimenting is a key contributor to innovative behaviour, as without experimenting individuals will struggle to generate and evaluate novel ideas.

Associating was found to have a moderate correlation with innovative behaviour, but it did not predict innovative behaviour. This finding may be due to the nature of associating. Dyer, Gregerson and Christensen (2011) stated that observing, questioning, networking and experimenting trigger associative thinking (the ability to connect unrelated ideas). Thus, associating is essentially the overarching innovative characteristic (Dyer et al., 2009). For example, the process of frequently asking questions, observing small details, actively searching for new ideas and testing ideas will provoke insights that will help individuals connect different ideas. Thus, associating may not necessarily be an innovative characteristic on its own, rather it is an outcome of the four other innovative characteristics. This is in line with Barak et al (2019), as they did not include associating as part of the innovative characteristic measure.

4.4 Psychological Capital and Innovative Characteristics

The results revealed that PsyCap had a moderate significant correlation with total innovative characteristics. PsyCap also explained the most variance in innovative characteristics (30%) compared to each PsyCap construct. Although there is no research that has looked at these constructs, we can understand this relationship from the conceptual understanding of PsyCap and innovative characteristics. This relationship will be examined by looking at each PsyCap construct. The first construct that will be discussed is self-efficacy.

Self-efficacy was found to have a moderate significant correlation with innovative characteristics. Self-efficacy is expected to be correlated with innovative

characteristics because of the nature of a self-efficacious individual. A self-efficacious individual's belief in their cognitive resources, and perseverance will promote innovative thinking, as they will be confident enough to ask questions, experiment with different ideas and network with diverse people (Stajkovic & Luthans, 1988). This self-confidence will also translate to a self-efficacious individual not giving up, which will enhance their ability to challenge the status quo.

Optimism was found to have a moderate significant correlation with innovative characteristics. This is in line with the conceptual understanding of optimism. Optimistic individuals have positive expectations and feel in-control of their destiny (Rego et al., 2012; Sweetman et al., 2010). This could enhance an individual's innovative characteristics because when faced with setbacks an optimistic individual will take matters in their own hands by trying out new ideas. Individuals that have positive expectations are also good at influencing others and are more likely to take risks (Le et al., 2015). This will enhance one's ability to network and experiment with ideas in unconventional ways.

Hope was found to have a moderate significant correlation with innovative characteristics. This is in line with the conceptual understanding of hope. Hopeful individuals are motivated, independent thinking's, and use more than one pathway to reach goals (Luthans et al., 2007). A hopeful individual's motivation is associated with innovative characteristics because it gives individuals the willpower to devote their time in finding new ideas. At the same time, a hopeful individuals independent thinking and ability to generate more than one pathway can help individuals connect problems in unrelated ways and experiment with alternative ideas.

Resilience was found to have a moderate significant correlation with innovative characteristics. This is in line with the literature on resilience. Resilient individuals are good at improvising in unexpected situations, they are curious and can 'bounce back' when faced with challenges (Tugade et al., 2004; Luthans et al., 2007). These qualities are associated with innovative characteristics, as resilient individuals are more likely to come up with alternative ideas when faced by setbacks and connect ideas in new ways.

4.5 Psychological Capital, Innovative Characteristics and Innovative behaviour

The regression analysis revealed that PsyCap and innovative characteristics statistically significantly predicted innovative behaviour. This model accounted for 52% of the variance of innovative behaviour. This large effect size was expected, as although PsyCap has been shown to predict innovative behaviour alone, it did not account for as much variance (28%). Thus, the combination of PsyCap and innovative characteristics is a stronger predictor. This is in line with the literature and previous results of this current study. It has been shown that PsyCap predicts innovative behaviour. For example, a hopeful individual is more likely to be innovative because of their ability to come up with alternative ideas. At the same time, innovative characteristics also predicts innovative behaviour. For example, an individual that can network is more likely to be innovative because of their ability to promote and test their ideas with other people. It has also been shown that an individual's confidence, optimism, hopefulness and resilience is associated with innovative characteristics, as these attributes can enhance one's ability to question, network, observe, experiment and associate. Therefore, when an individual has high PsyCap they are likely to have innovative characteristics, which in combination is a strong predictor of innovative behaviour.

The regression analysis that included each PsyCap construct and innovative characteristic construct revealed that self-efficacy was the only PsyCap construct that could predict innovative behaviour. Self-efficacy may be seen to predict innovative behaviour the most because of the nature of this construct. Self-efficacy has been shown to be a necessary condition for creative outcomes because an individual may only be able to achieve creative outcomes when they believe in their ability (Ford, 1996; Bandura, 1997, Tierney & Farmer, 2002). Therefore, self-efficacy may be necessary for innovative behaviour because without self-efficacy individuals will not have the motivation or confidence to come up with alternative outcomes. The fact that only one PsyCap construct was found to predict innovative behaviour is in line with Luthans et al (2007) theory of psychological capital, as it has been noted that overall PsyCap is bigger than the combination of its elements. This is not necessarily the case for innovative characteristics, as the regression analysis revealed that observing, networking and experimenting could all predict innovative behaviour.

4.6 Overall findings

In essence, the majority of the results were consistent with the literature. PsyCap was related to innovative behaviour and predicted innovative behaviour. However, resilience was not found to predict innovative behaviour, which may be due to the nature of resilience. Innovative characteristics was also related with innovative behaviour and predicted innovative behaviour. However, questioning did not predict innovative behaviour because it may not be directly related to the innovative process. Associating also did not predict innovative behaviour, which may be due to the nature of associating as an overarching innovative characteristic. PsyCap was also related to innovative characteristics, which is consistent with the conceptual understanding of both constructs. Lastly, the regression analysis revealed that overall PsyCap and innovative characteristics are strong predictors of innovative behaviour.

4.7 Theoretical and Practical implications

This research study explored the relationship between PsyCap, innovative characteristics and innovative behaviour. The findings demonstrated a potential theoretical framework that can contribute to innovative behaviour. This adds to South African research and international research on innovation. This theoretical framework can help future researchers test the joint impact of PsyCap and innovative characteristics on innovative behaviour. The exploratory factor analysis that was conducted also adds to research, as it demonstrates that the innovative characteristics measure created by Barak et al (2019) and the associating sub-scale derived from Jabri (1991) formed one coherent factor structure and is a reliable measure that can be used in South Africa. Using Fredrickson's broaden-and-build theory as a theoretical framework, the results of this research study also suggests that broadening thought action repertories due to positive psychological capital can potentially enhance innovative behaviour. Future researchers can then determine the impact of a positive mindset and a positive environment on innovative behaviour.

This research study also has important practical implications. PsyCap and innovative characteristics can both be viewed as state-like. Research on PsyCap has demonstrated that PsyCap is not a trait, rather it is something that can be developed over time. This is also evident with innovative characteristics, as Dyer et al (2011) revealed that innovative characteristics are not simply a generic trait, rather it can be

developed. Therefore, PsyCap and innovative characteristics are receptive to development and performance management. This has been demonstrated in research. For example, research has shown that self-efficacy, optimism, hope and resilience can be developed through training interventions (as little as one to three hours of training) (Luthans, Avey & Patera, 2008; Luthans, Avey, Avolio & Peterson, 2010). Similarly, Dyer et al (2011) demonstrated different ways to master the skills of innovative characteristics. Therefore, future researchers can use the significant relationships found in this research study as a framework to come up with training interventions to increase one's PsyCap and innovative characteristics, and then test the effectiveness of these interventions on innovative behaviour.

4.8 Limitations

Although this research study has contributed to research and found significant results, there are limitations that should be acknowledged when interpreting the results. These will be outlined below.

This research study has methodological limitations. A non-experimental cross-sectional quantitative design was used, which means no casual relationships could be established (Cook & Cook, 2008). Therefore, the results cannot be used to validate theories, and there is no indication as to why certain relationships were found (Cook & Cook, 2008). Convenience sampling was also used in this research study to gather a large amount of data in a short space of time. However, this sampling method does have limitations because it is a non-probability technique. A non-probability technique makes it difficult for the sample to represent the population, as there is no way to ensure that everyone had an equal chance of participating, and the participants that volunteered to participate may have different characteristics from the general population (Acharya et al., 2013). Therefore, the results of this study cannot be generalized to other South African organisations. Furthermore, the sample was not balanced in terms of race and gender, as 77.5% of the participants were female and 39.8% of the participants were White. These characteristics are not representative of the South African population, as in South Africa women make up 51% of the population and Africans make up 80.7% of the population (StatsSA, 2019). Thus, it is not appropriate to generalise these results.

Another limitation of this study is the self-report questionnaire that was used. Self-report questionnaires may cause social desirability response bias. Social desirability bias occurs when individuals provide responses that they believe the researcher wants, rather than being honest (Salkind, 2010). Although it is not possible to fully eliminate social desirability bias, this research study tried to combat the effects by communicating to the participants that they will be anonymous and confidential. This could also potentially eliminate employees responding in a way the employer wants.

The likert type scales that were used could have also been problematic, as the pre-determined set of choices may be restrictive and not suitable for what the participants want to answer (White & McBurney, 2013). The participants may have also interpreted the anchors on the likert scales differently because it is impossible for the anchors to be equidistant (Hartley, 2014). The participants could have also avoided choosing an "extreme" option on the scale because "extremists" are associated with negative implications, even if the extreme option would have been most accurate (Hartley, 2014). Another potential limitation is the measure that was used for associating. Unlike the innovative characteristics measure adopted from Barak et al (2019), the associating measure was not based on Dyer et al (2009) innovators DNA model. Therefore, this measure may not necessarily be measuring the associating construct of Dyer et al (2009) innovators DNA model, which may have affected the results.

Despite the limitations of this study, there are some advantages to this study. This research study was anonymous, confidentiality and non-experimental. Thus, no researcher bias occurred. This research study also had a large sample size. Thus, the results could have been more accurate than studies that had a small sample size (Faber & Fonseca, 2014). This research study can also contribute to future research. This will be discussed below.

4.9 Directions for future research

Research on PsyCap and innovative behaviour is very limited, and there has been no research that has examined innovative characteristics since Dyer et al (2009) study. Therefore, this research study has contributed to our understanding of what may

influence innovative behaviour, which can help future researchers develop effective training interventions. This research study also demonstrated the reliability of the innovative characteristics measure in South Africa. Thus, future researchers can use this measure.

It is recommended that future researchers develop an associating measure that is in line with Dyer et al (2009) study. This will help determine the true influence and predictive effect associating may have on innovative behaviour. It is also recommended that future researchers expand on this research by measuring innovative behaviour experimentally. However, it is recommended that this experimental study should be done in the workplace, rather than in a laboratory setting, as this will build a true reflection of the casual relationship between PsyCap, innovative characteristics and innovative behaviour. In a similar vein, it is recommended that future researchers use a longitudinal study to investigate the casual relationship between PsyCap, innovative characteristics and innovative behaviour to ensure accurate results.

This research study also provides valuable insight for future researchers to examine the performance outcomes of innovative behaviour. Future researchers can also determine if innovative characteristics or PsyCap plays a moderating role in influencing innovative behaviour. Lastly, the results of this research study can help future researchers come up with a fully-fledged theoretical framework of what contributes to innovative behaviour. A theoretical framework of innovative behaviour will help develop effective training interventions and increase organisational effectiveness.

4.10 Conclusion

In conclusion, this research study provides valuable insight of innovative behaviour in the workplace, and what might contribute to employee's innovative behaviour. The results of this study revealed that there is a significant relationship between PsyCap, innovative characteristics and innovative behaviour. The results also revealed that PsyCap and innovative characteristics significantly predicted innovative behaviour. These results provide a unique contribution to the literature by examining both PsyCap and innovative characteristics in relation to innovative behaviour. This will

help practitioners and researchers have a clearer understanding of the psychological processes that underpin innovative behaviours in the workplace.

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Appendix

Appendix A: Instruments

Demographic questionnaire

1. What is your gender?
   - ☐ Male
   - ☐ Female
   - ☐ Other
   - ☐ I prefer not to say

2. What is your age in years?
   - ☐ 20 & younger
   - ☐ 21-30
   - ☐ 31-40
   - ☐ 41-50
   - ☐ 51-60
   - ☐ 60 & older

3. What is your race? *(Please note that race is only used to determine the number of people from different race groups within the sample)*
   - ☐ African
   - ☐ Indian
   - ☐ Coloured
   - ☐ White
   - ☐ Other, please specify _____

4. What is your marital status?
   - ☐ Married
   - ☐ Unmarried
   - ☐ Divorced

5. Please indicate your home language
    - ☐ English
    - ☐ Afrikaans
    - ☐ isiZulu
    - ☐ isiXhosa
    - ☐ isiNdebele
    - ☐ Sesotho
    - ☐ Sepedi
    - ☐ Setswana
    - ☐ siSwati
    - ☐ Tshivenda
    - ☐ Xitsonga
    - ☐ Other, please specify _____

6. Please indicate your job level
    - ☐ Entry level
    - ☐ Intermediate
    - ☐ Junior management
    - ☐ Middle management
    - ☐ Upper management
    - ☐ Executive
    - ☐ Other, please specify _____

7. Please indicate job industry in which you work (i.e. insurance, banking, marketing etc.)

_____

8. Please indicate your job title

_____

9. How long have you worked for this organisation?

_____

10. How long have you worked in your current position?

_____

Psychological Capital questionnaire

	Psychological Capital (PsyCap) *Instructions:* Below are statements that describe how you think about yourself **right now.** Please be as honest as possible	**Strongly Disagree**	**Disagree**	**Somewhat Disagree**	**Somewhat Agree**	**Agree**	**Strongly Agree**
1	I feel confident analyzing a long-term problem to find a solution	1	2	3	4	5	6
2	If I should find myself in a jam at work, I could think of many ways to get out of it	1	2	3	4	5	6
3	When I have a setback at work, I have trouble recovering from it, moving on	1	2	3	4	5	6
4	I feel I can handle many things at a time at this job.	1	2	3	4	5	6

**note: items have been left out due to copyright*

Innovative behaviour questionnaire

	Innovative Behaviour *Instructions:* Rate the questions below for how accurately they reflect the way you generally feel and behave	**Never**	**Almost Never**	**Sometimes**	**Fairly Often**	**Very Often**	**Always**
	In your current job, how often do you:						
1	Look for opportunities to improve an existing process, technology, product, service, or work relationship?	1	2	3	4	5	6
2	Recognise opportunities to make a positive difference in your work, department, organisation, or with customers?	1	2	3	4	5	6
3	Pay attention to non-routine issues in your work, department, organisation, or the marketplace	1	2	3	4	5	6
4	Generate ideas or solutions to address problems?	1	2	3	4	5	6
5	Define problems more broadly in order to gain greater insight into them?	1	2	3	4	5	6
6	Experiment with new ideas and solutions?	1	2	3	4	5	6
7	Test out ideas or solutions to address unmet needs?	1	2	3	4	5	6
8	Evaluate the strengths and weaknesses of new ideas?	1	2	3	4	5	6
9	Try to persuade others of the importance of a new idea or solution?	1	2	3	4	5	6
10	Push ideas forward so that they have a chance to become implemented?	1	2	3	4	5	6
11	Take the risk to support new ideas?	1	2	3	4	5	6
12	Implement changes that seem to be beneficial?	1	2	3	4	5	6
13	Work the bugs out of new approaches when applying them to an existing process, technology, product, or service?	1	2	3	4	5	6
14	Incorporate new ideas for improving an existing process, technology, product, or service into daily routines?	1	2	3	4	5	6

Innovative characteristics questionnaire

	Innovative Characteristics *Instructions:* Rate the questions below for how accurately they reflect the way you generally feel and behave	**Strongly Disagree**	**Disagree**	**Somewhat Disagree**	**Somewhat Agree**	**Agree**	**Strongly Agree**
1	While working, I think of new ideas that come through the observing world	1	2	3	4	5	6
2	While working, I often ask questions that challenge the status quo	1	2	3	4	5	6
3	I have a network with which I interact to get new ideas	1	2	3	4	5	6
4	When working, I actively search for new ideas through experimenting	1	2	3	4	5	6

**note: items have been left out due to copyright*

Associating questionnaire

	Jabri's (1991) Modes of problem-solving scale *Instructions:* Please indicate the extent to which you are the kind of person who is likely or unlikely to enjoy the following activities. Please be as honest as possible	**Extremely unlikely to enjoy**	**Unlikely to enjoy**	**Slightly Unlikely to enjoy**	**Neutral**	**Slightly Likely to enjoy**	**Likely to enjoy**	**Extremely likely to enjoy**
1	Being confronted with a maze of ideas which may, or may not, lead me somewhere.	1	2	3	4	5	6	7
2	Pursuing a problem particularly if it takes me into areas, I don't know much about.	1	2	3	4	5	6	7
3	Linking ideas which stem from more than one area of investigation.	1	2	3	4	5	6	7
4	Being fully occupied with what appear to be novel methods of solution	1	2	3	4	5	6	7
5	Making unusual connections about ideas even if they are trivial	1	2	3	4	5	6	7
6	Searching for novel approaches not required at the time.	1	2	3	4	5	6	7
7	Struggling to make connections between apparently unrelated ideas	1	2	3	4	5	6	7
8	Spending time tracing relationships between disparate areas of work.	1	2	3	4	5	6	7
9	Being 'caught up' by more than one concept, method, or solution.	1	2	3	4	5	6	7

Appendix B: Permission to use PsyCap scale

Nadia Criticos

Permission to use the PCQ is for the following research project:

Project title:

The relationship between psychology capital and innovation

Research focus:

The aim of this research is to examine the relationship between psychology capital and innovation

Key hypotheses:

There is a relationship between psychology capital and innovation

Sample characteristics:

The sample I will be using is diverse employees. Male and female.

Research method:

This study is quantitative, cross sectional and Correlational

Organizational characteristics:

The organisation will consist of diverse employees

Organization domain:

Travel Industry

Other domain:

Automotive

Country/Countries:

South Africa

I will be conducting this study in English:

Yes

Language:

English

You requested permission to reproduce the number of copies of the PCQ stated below. The copyright holder has agreed to grant a license to reproduce this number of copies of the PCQ within one year of the date listed on the cover page of this document.

Exact number of reproductions being requested for this research project: 1

You agreed to all the conditions of use outlined in this document by electronically signing the Research Permission for the Psychological Capital Questionnaire form.

Electronic signature: Nadia Criticos
Date of signature: 4th of April

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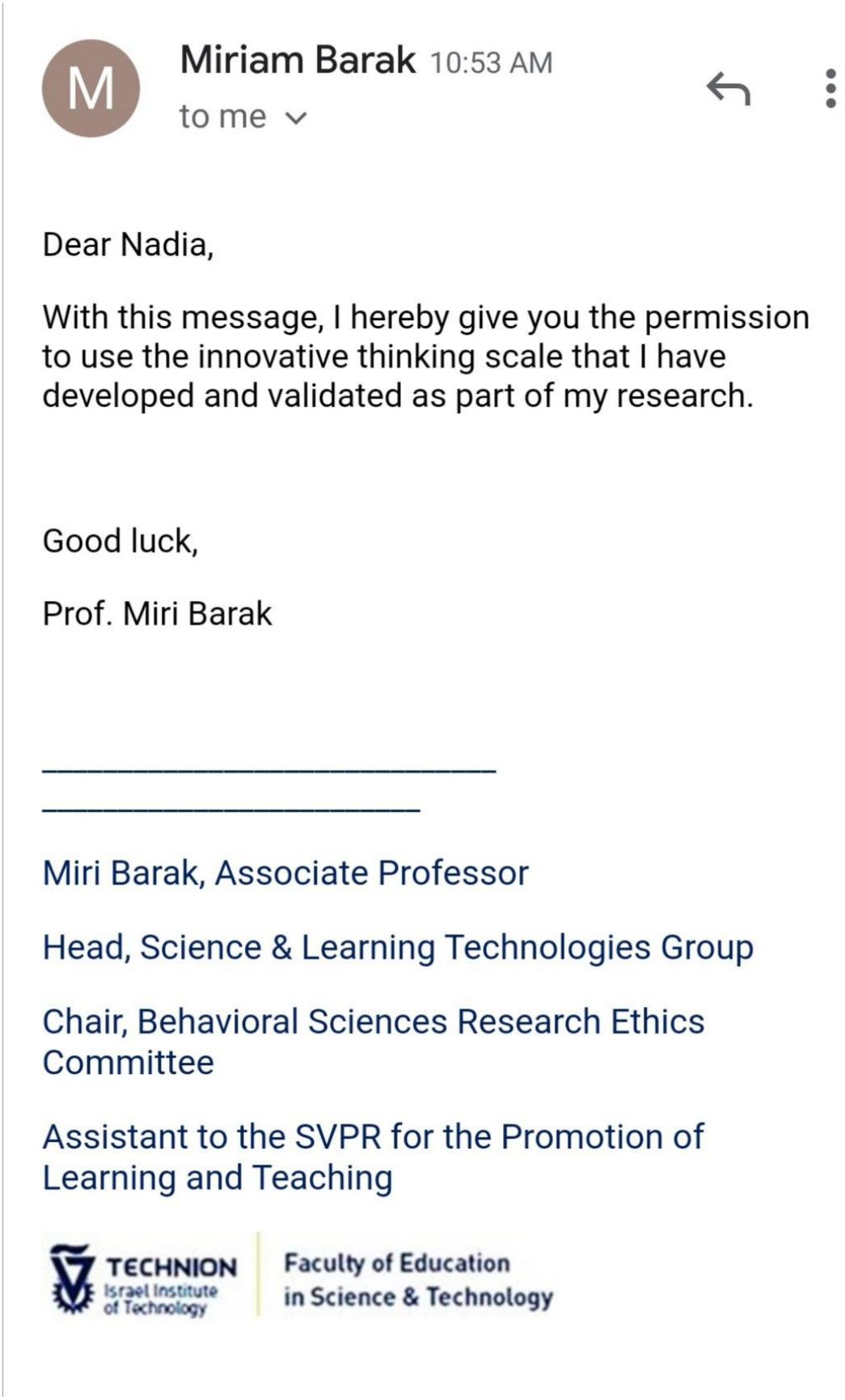
Appendix C: Permission to use Innovative Characteristics scale



Miriam Barak 10:53 AM

to me

Dear Nadia,

With this message, I hereby give you the permission to use the innovative thinking scale that I have developed and validated as part of my research.

Good luck,

Prof. Miri Barak

Miri Barak, Associate Professor

Head, Science & Learning Technologies Group

Chair, Behavioral Sciences Research Ethics Committee

Assistant to the SVPR for the Promotion of Learning and Teaching

TECHNION Israel Institute of Technology | Faculty of Education in Science & Technology

Psychology department
School of Human and Community Development
University of the Witwatersrand
Private Bag 3, WITS, 2050
Tel: (011)717 4500 Fax: (011) 717 4559

Appendix D: Organisation consent

Dear Sir/Madam

My name is Nadia Criticos and I am a Master's Student at the University of Witwatersrand. As part of my studies I have to conduct a research project. I am investigating the relationship of psychological capital and innovation. This will be done by specifically looking at the constructs of psychological capital (hope, self-efficacy, optimism and resilience), innovative behaviour and innovative characteristics.

This research study can give your organisation more insight as to why certain employees are innovative. This will also help future researchers come up with effective innovative training programs.

Participation will involve your employees answering an online questionnaire on Google forms. In the demographic part of the questionnaire I will ask about gender, age, race, language, marital status, job level, job title, job industry, and tenure. In the second part of the questionnaire there will be the psychological capital scale, an innovative behaviour scale and an innovative characteristics scale. It will only take approximately 10 minutes to answer the questionnaire. You are welcome to have access to this questionnaire before you consent to distribute it.

This research study has ethical clearance from the University of Witwatersrand. The questionnaire will also be completely anonymous and confidential, as we do not require any identification and the data will be password protected that only the researchers will have access to.

I would like to request your permission to conduct this study at your organization and if possible, I would appreciate it if you can help distribute an email to your employees with a link to the questionnaire.

This study will be written as a research report and I will provide your organization with a summary of this report that you can distribute to your employees.

I look forward to hearing from you

Masters student: Nadia Criticos
nadia.criticos@gmail.com
+ 27 (82) 572 8773

Supervisor: Karen Milner
Karen.milner@wits.ac.za
+ 27 (11) 717 8663

For any information regarding the ethics of this study you may contact Shaun Schoeman from the University's Ethics Committee (HREC)

shaun.schoeman@wits.ac.za

+27 (11) 717 1408

Psychology department

School of Human and Community Development
University of the Witwatersrand
Private Bag 3, WITS, 2050
Tel: (011)717 4500 Fax: (011) 717 4559

I Anil Narain do/~~do not~~ consent for Nadia Criticos to conduct a research study at my organisation. I understand that the employee's participation is completely voluntary and all details will be anonymous and confidential

Signed: _____

Date: 26/7/2019

Psychology department
School of Human and Community Development
University of the Witwatersrand
Private Bag 3, WITS, 2050
Tel: (011)717 4500 Fax: (011) 717 4559

I CAROL do/~~do not~~ consent for Nadia Criticos to conduct a research study at my organisation. I understand that the employee's participation is completely voluntary and all details will be anonymous and confidential

Signed: _____

Date: 20/05/2014

Psychology department
School of Human and Community Development
University of the Witwatersrand
Private Bag 3, WITS, 2050
Tel: (011)717 4500 Fax: (011) 717 4559

I Lara Casasola do/do not consent for Nadia Criticos to conduct a research study at my organisation. I understand that the employee's participation is completely voluntary and all details will be anonymous and confidential

Signed:

Date: 15/06/19

Psychology department
School of Human and Community Development
University of the Witwatersrand
Private Bag 3, WITS, 2050
Tel: (011)717 4500 Fax: (011) 717 4559

Appendix E: Participation information sheet

Dear Sir/Madam

My name is Nadia Criticos and I am a Master's Student at the University of Witwatersrand. As part of my studies I have to conduct a research project. I am investigating the relationship of psychological capital and innovation. This will be done by specifically looking at the constructs of psychological capital (hope, self-efficacy, optimism and resilience) innovative behaviour and innovative characteristics.

I would like to invite you to participate in this study by taking part in an online questionnaire. In the demographic part of the questionnaire I will ask about gender, age, race, language, marital status, job level, job title, job industry, and tenure. In the second part of the questionnaire there will be the psychological capital scale, an innovative behaviour scale and an innovative characteristics scale.

This will only take approximately 10 minutes to complete. I would really appreciate your participation but there are no disadvantages or advantages for not participating and you may withdraw at any time before data collection.

The questionnaire will be completely anonymous and confidential, as we don't require any identification and the data will be password protected that only the researchers will have access to.

This study will be written as a research report and I will provide your organization with a summary of this report to email to you once the study is completed. If you have any questions during or after this research or feel any distress, please do not hesitate to contact me from the details provided below.

If you wish to participate please click on the link of the questionnaire. Clicking this link will indicate your consent is given to participate in this study

Thank you so much

Masters student: Nadia Criticos
nadia.criticos@gmail.com
+27 (82) 572 8773

Supervisor: Karen Milner
karen.milner@wits.ac.za
+27 (11) 717 8663

For any information regarding the ethics of this study you may contact Shaun Schoeman from the University's Ethics Committee (HREC)

shaun.schoeman@wits.ac.za
+27 (11) 717 1408

Appendix F: Ethics approval

UNIVERSITY OF THE WITWATERSRAND, JOHANNESBURG

HUMAN RESEARCH ETHICS COMMITTEE (SCHOOL OF HUMAN & COMMUNITY DEVELOPMENT

CLEARANCE CERTIFICATE	**PROTOCOL NUMBER: MORG/19/001 IH**
PROJECT TITLE:	The relationship between psychological capital and innovation
INVESTIGATORS	Criticos Nadia
DEPARTMENT	Psychology
DATE CONSIDERED	01/07/19
DECISION OF COMMITTEE*	Approved

This ethical clearance is valid for 2 years and may be renewed upon application

DATE: 01 July 2019

CHAIRPERSON
(Dr Colleen Bernstein)

cc Supervisor:

Prof. Karen Milner
Psychology

DECLARATION OF INVESTIGATOR (S)

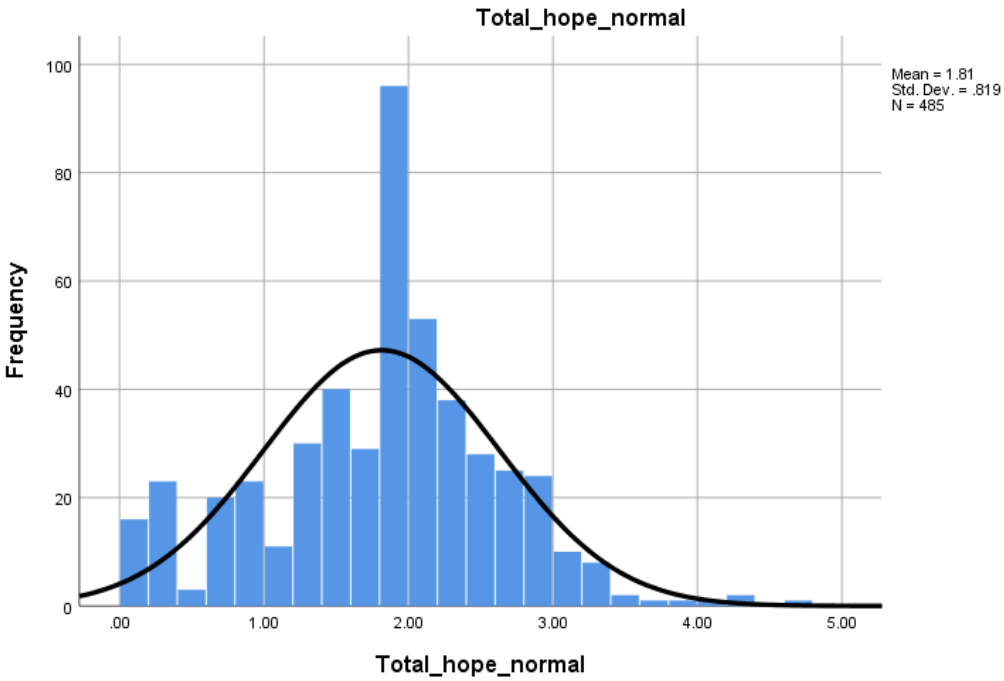
To be completed in duplicate and **one copy** returned to the Secretary, Room 100015, 10th floor, Senate House, University.

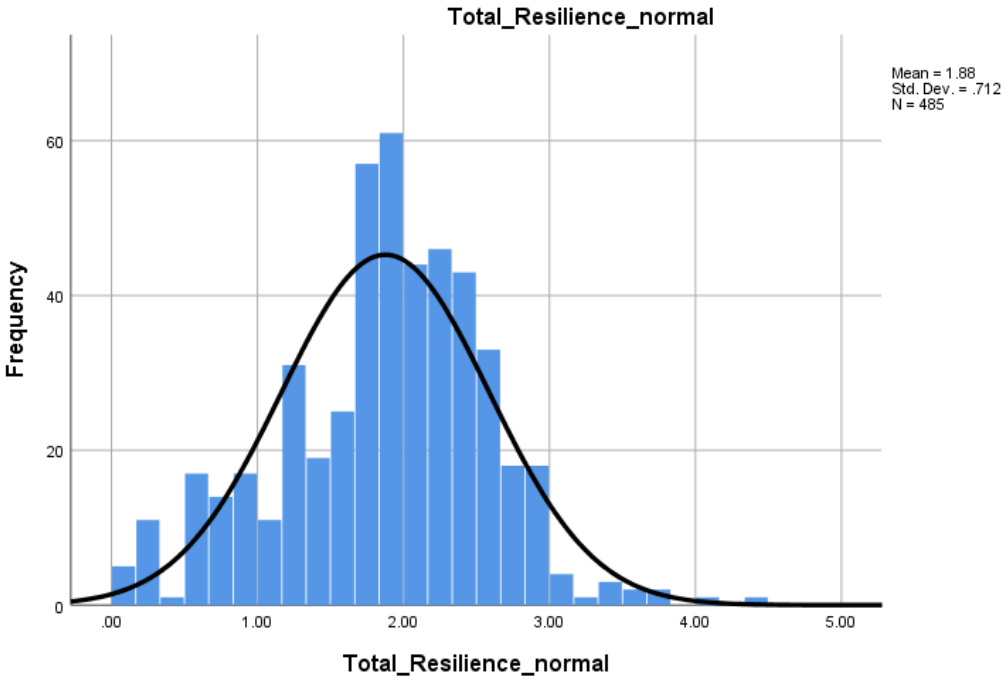
I/we fully understand the conditions under which I am/we are authorized to carry out the abovementioned research and I/we guarantee to ensure compliance with these conditions. Should any departure be contemplated from the research procedure, as approved, I/we undertake to submit a revised protocol to the Committee.

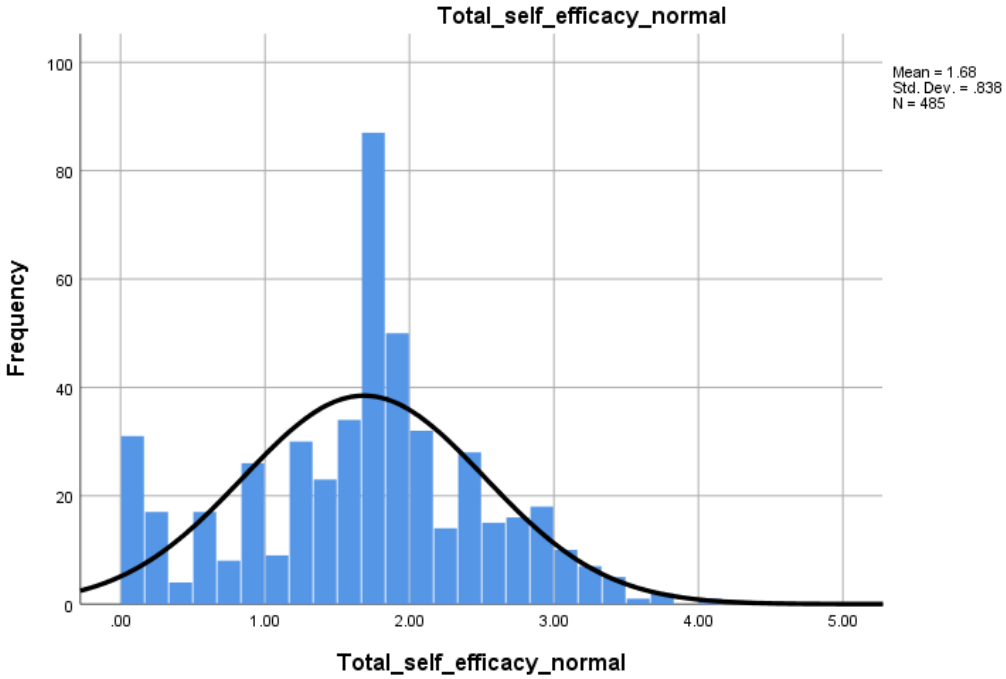
This ethical clearance will expire on 31 December 2021

PLEASE QUOTE THE PROTOCOL NUMBER IN ALL ENQUIRIES

Appendix G: Histogram



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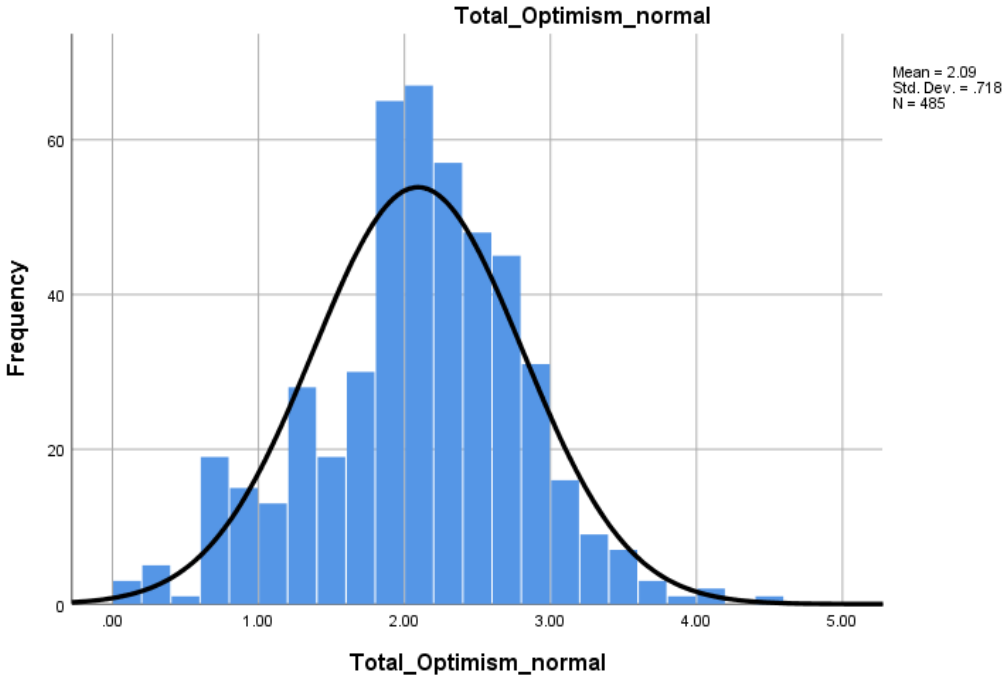
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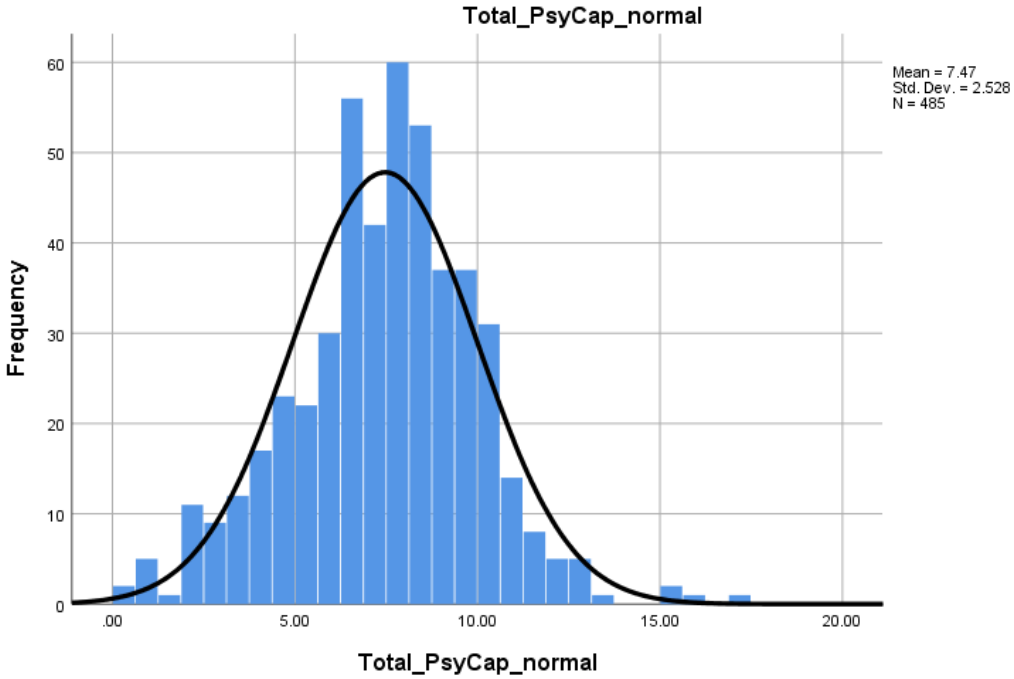
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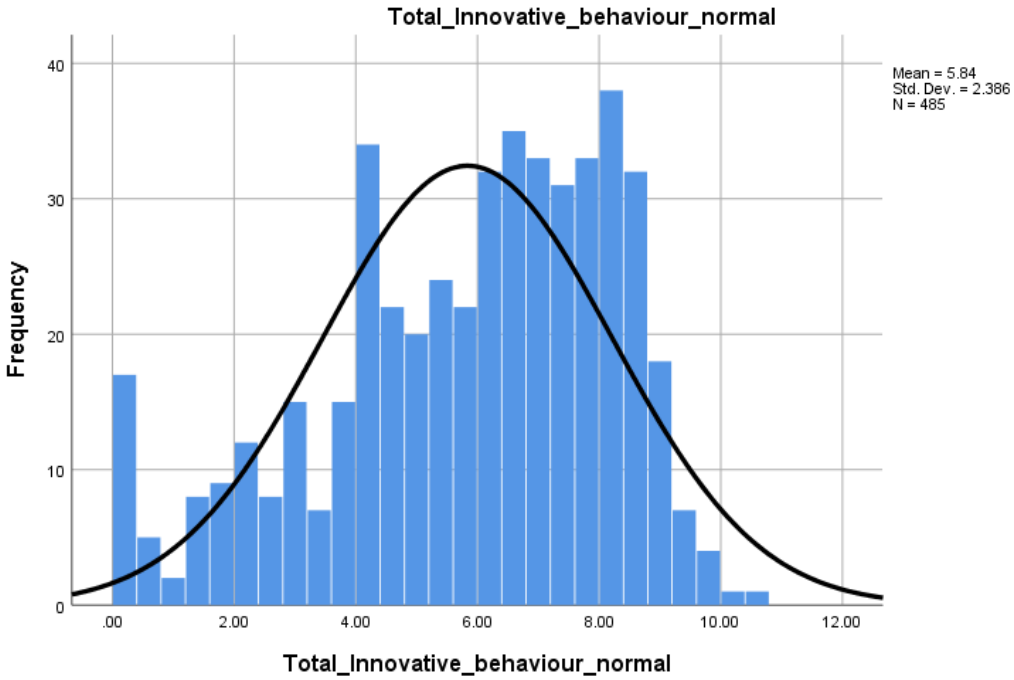
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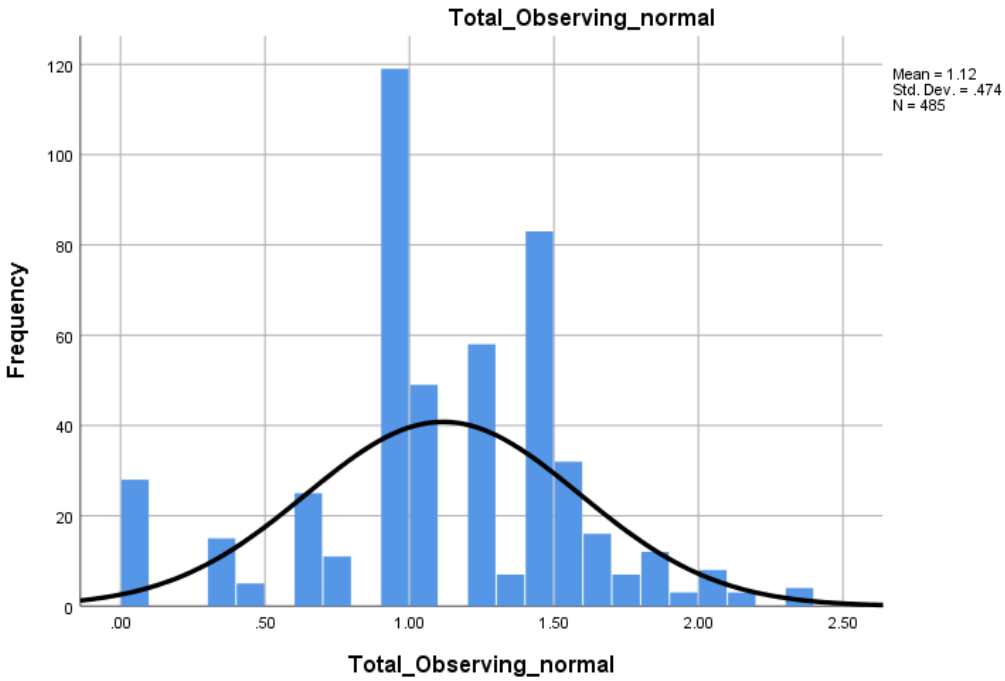
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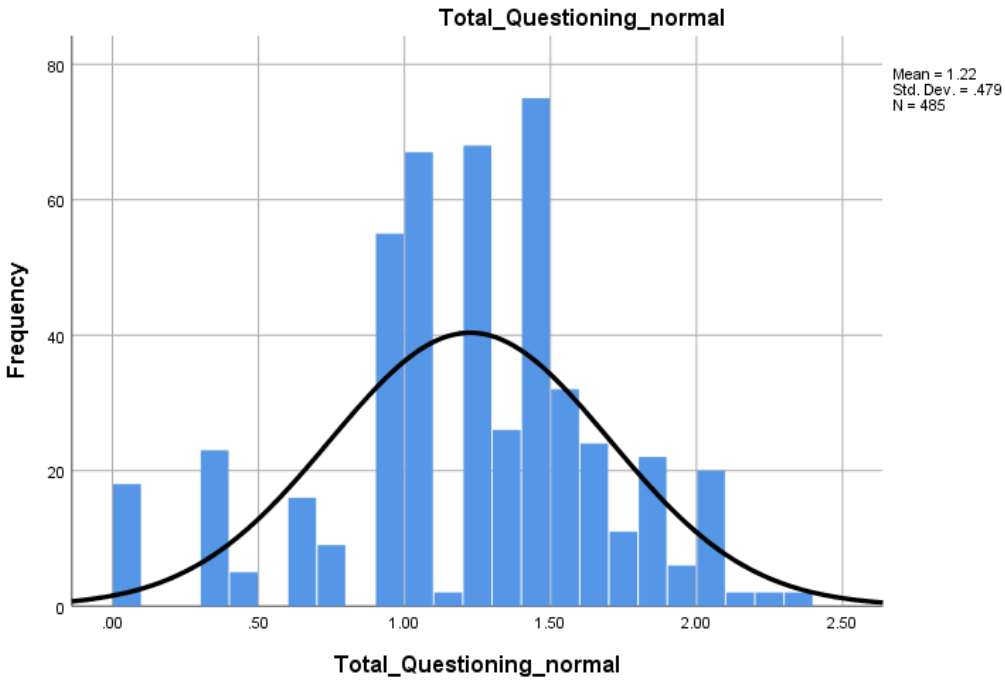
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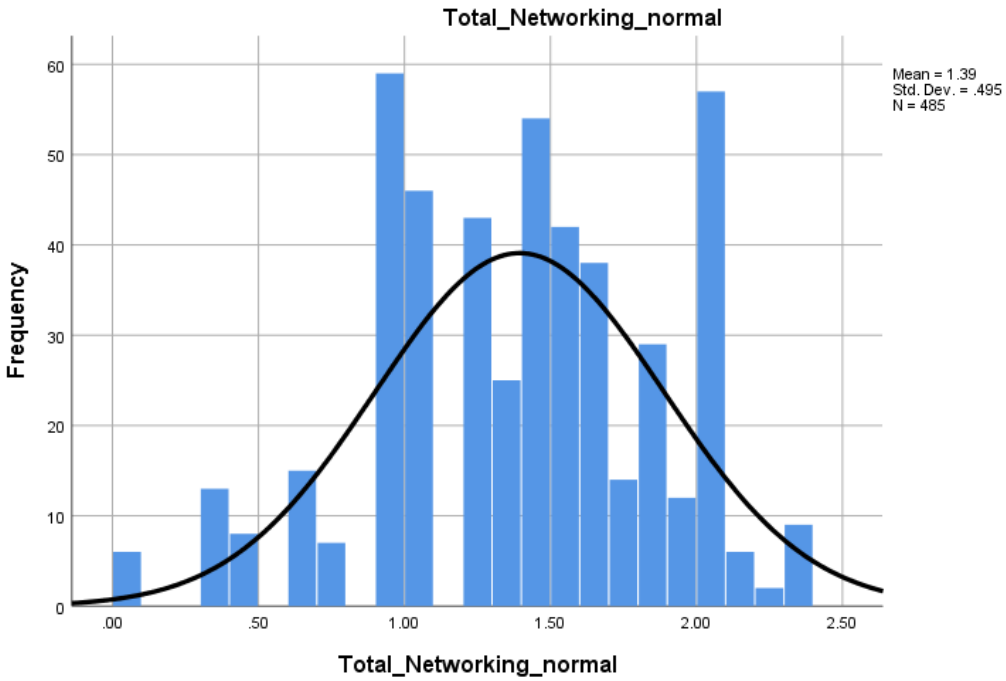
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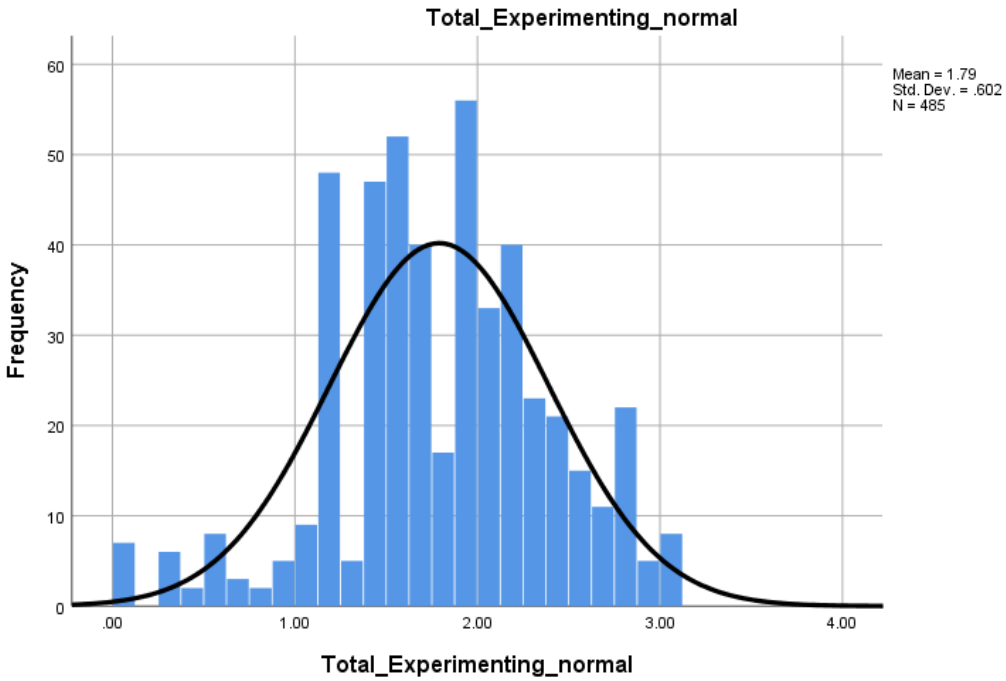
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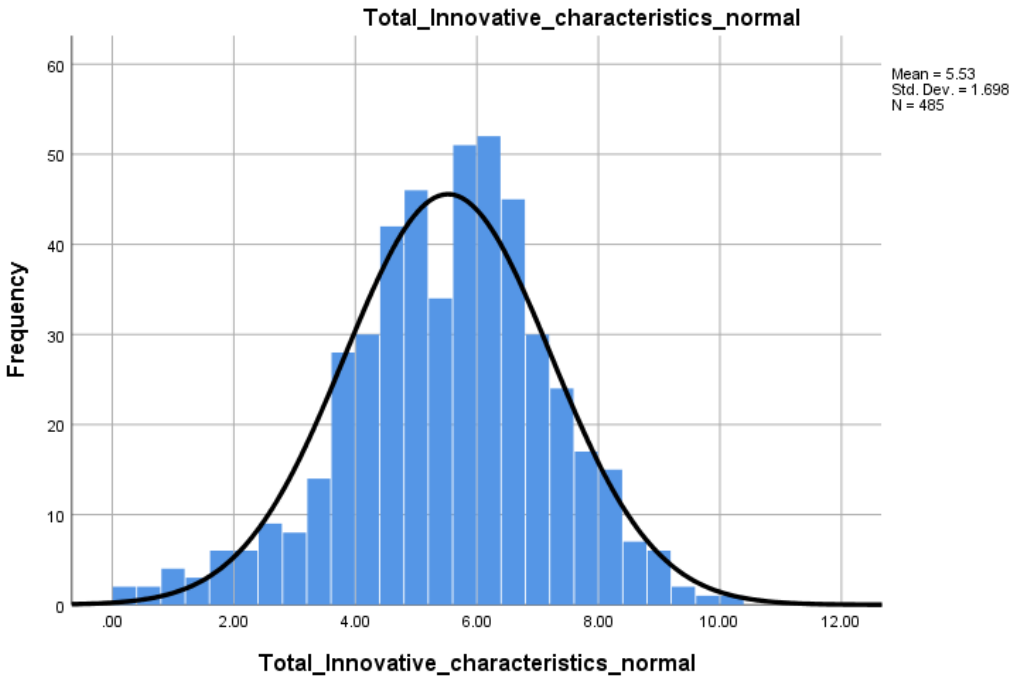
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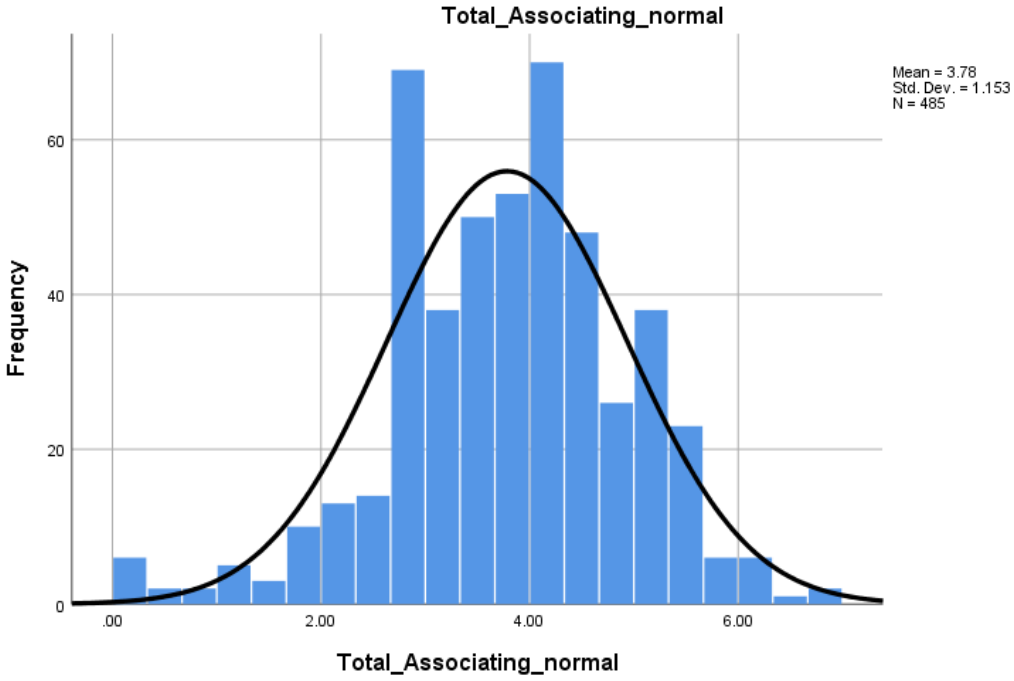
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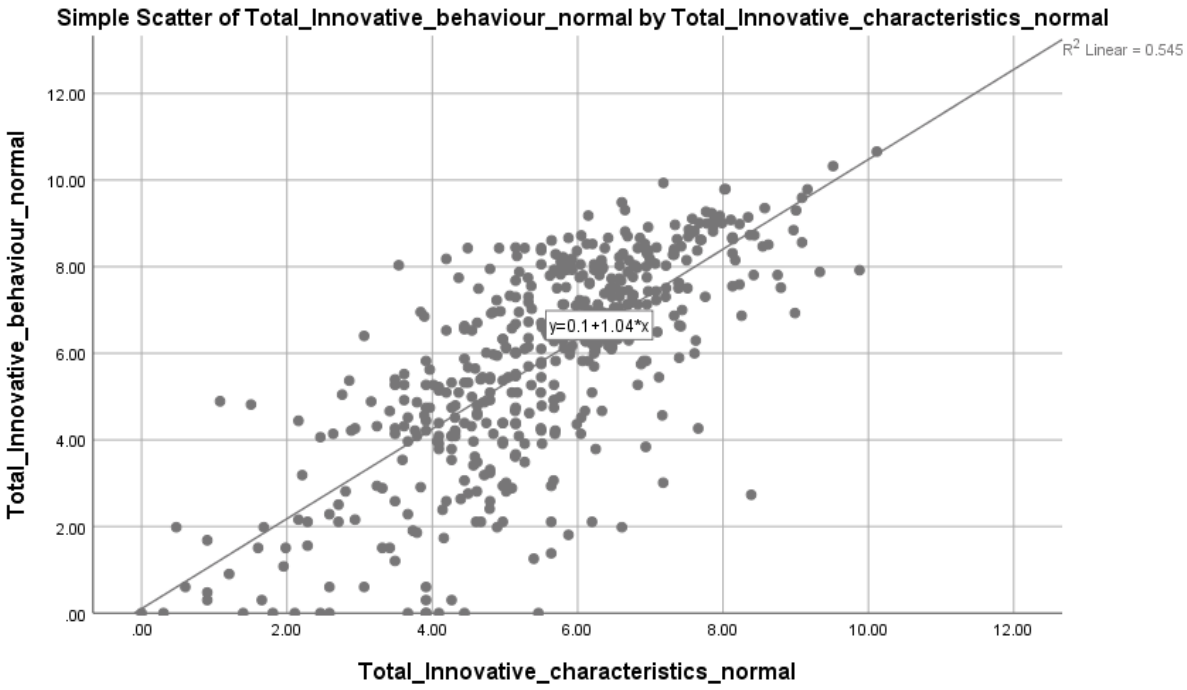
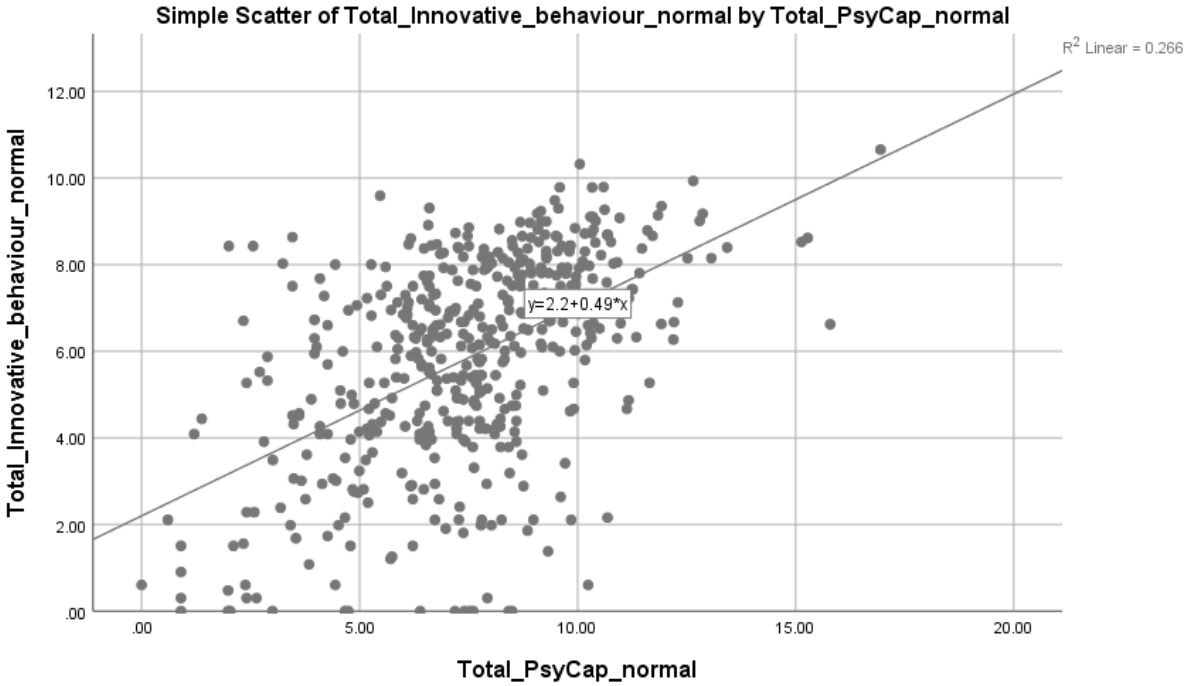
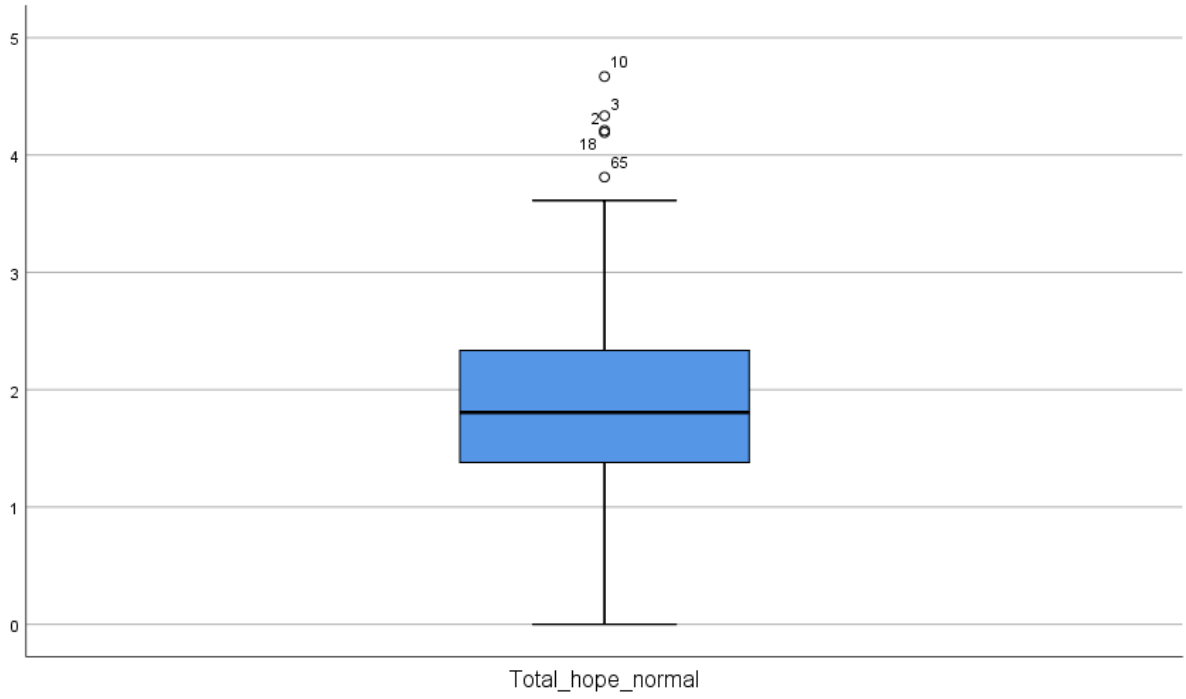
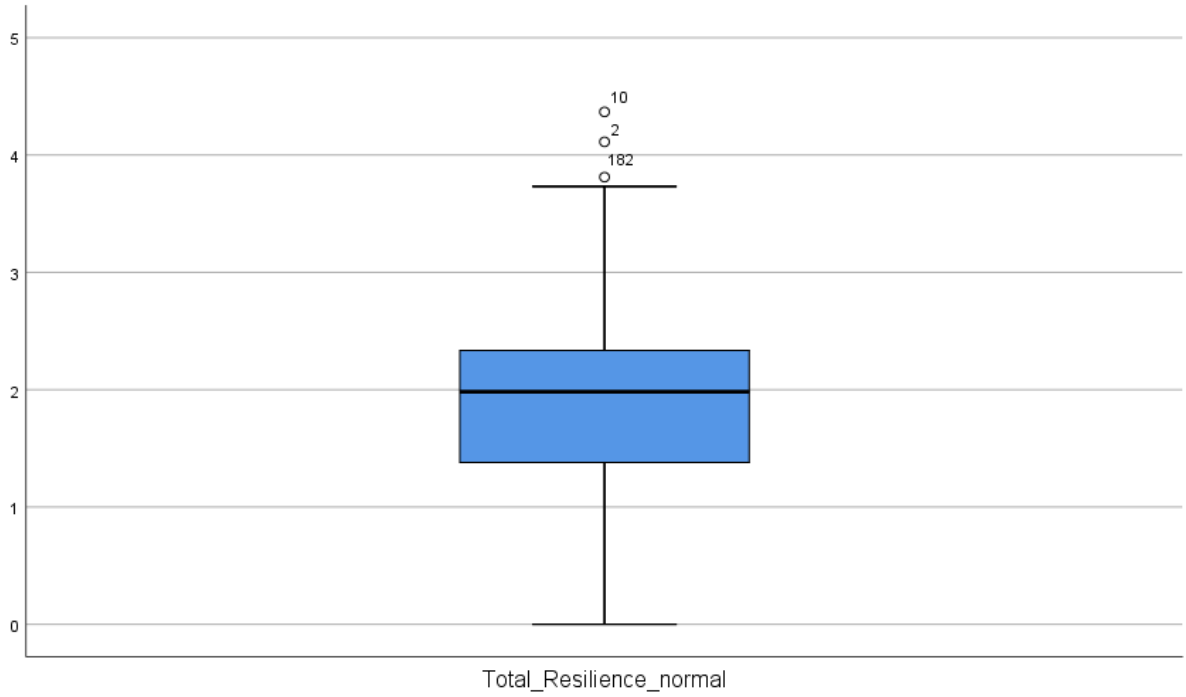
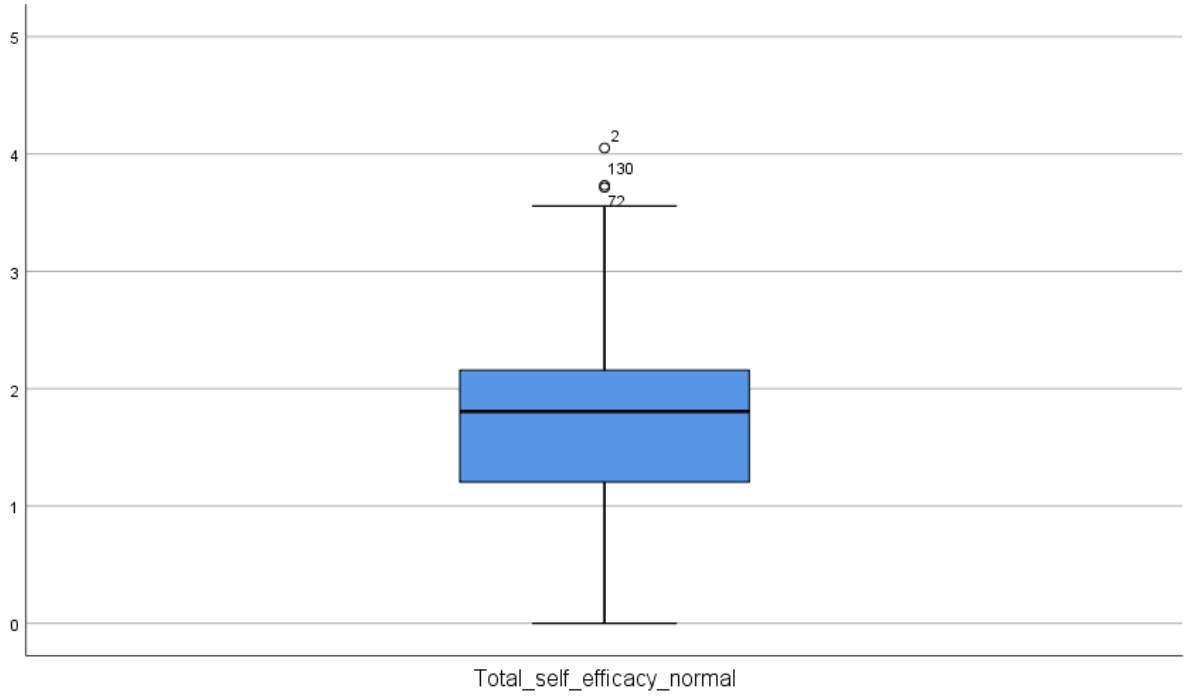


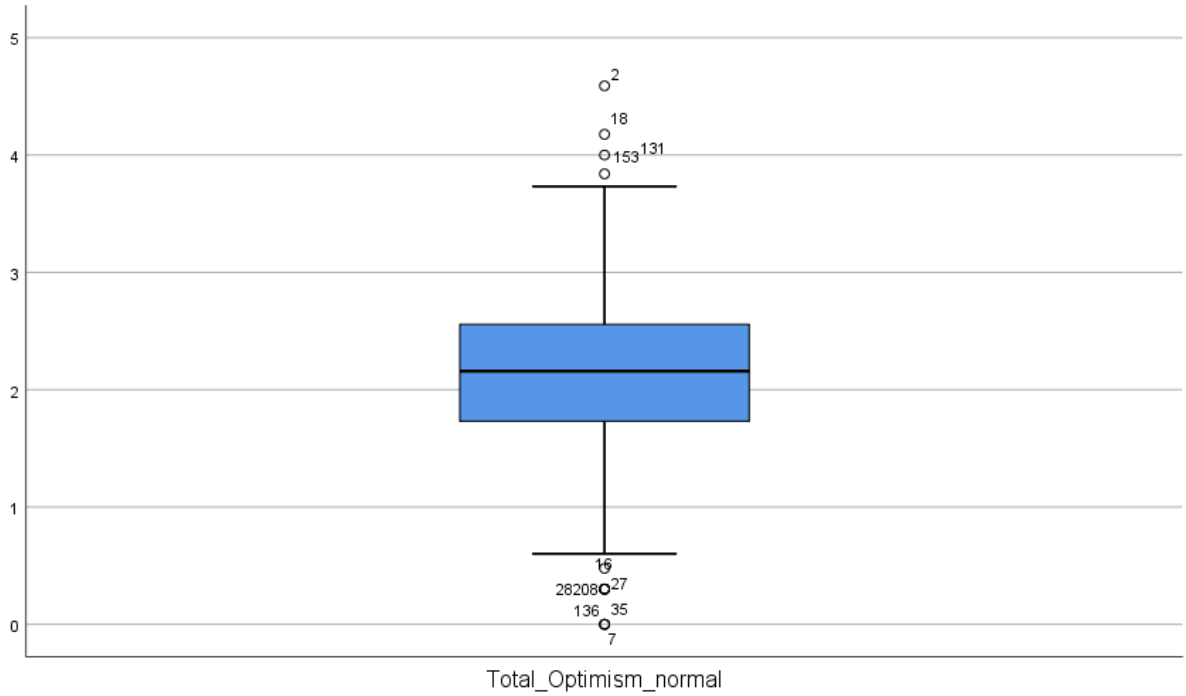


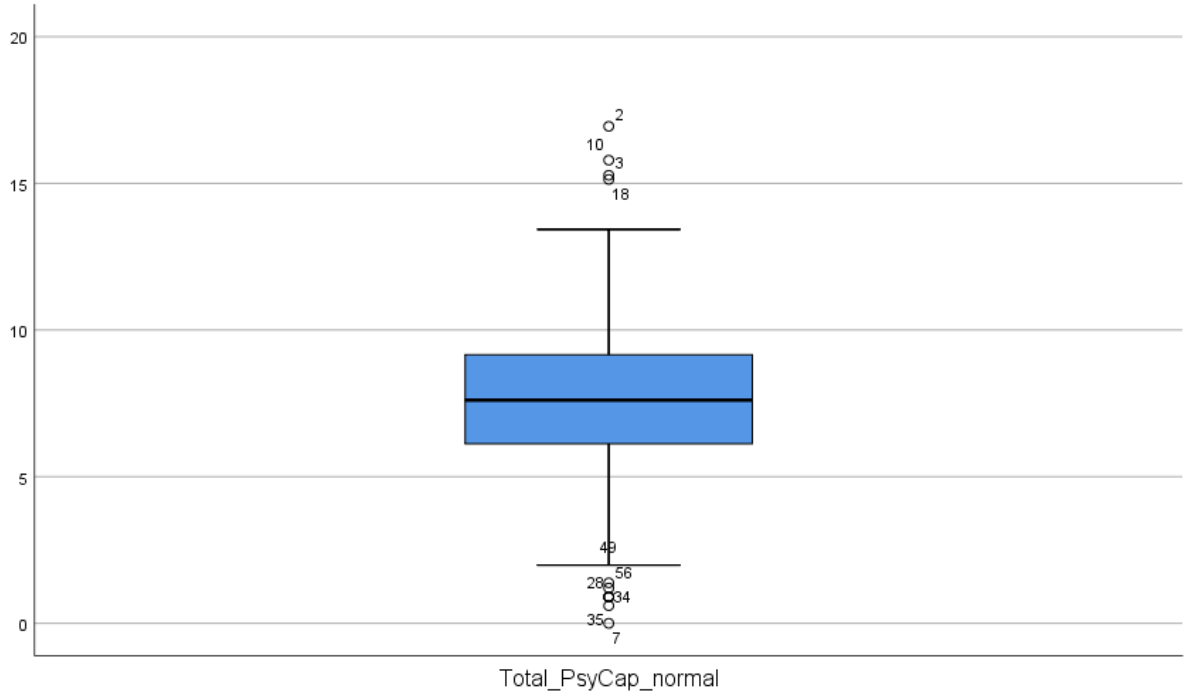
Appendix I: Outliers

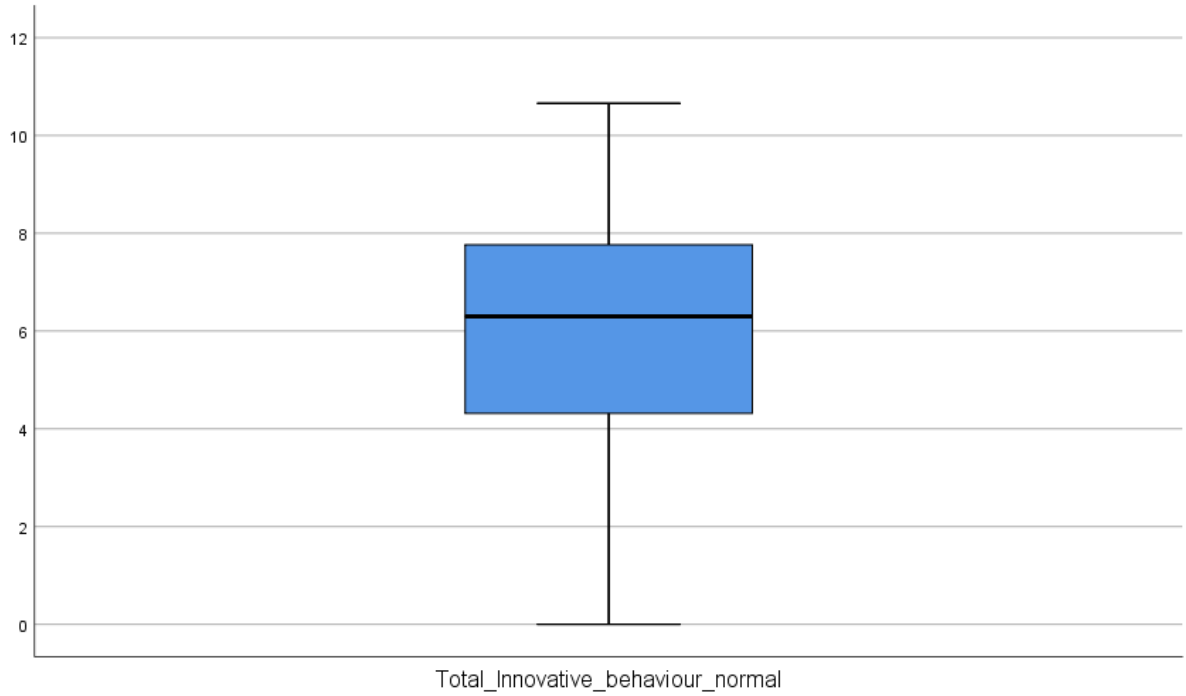


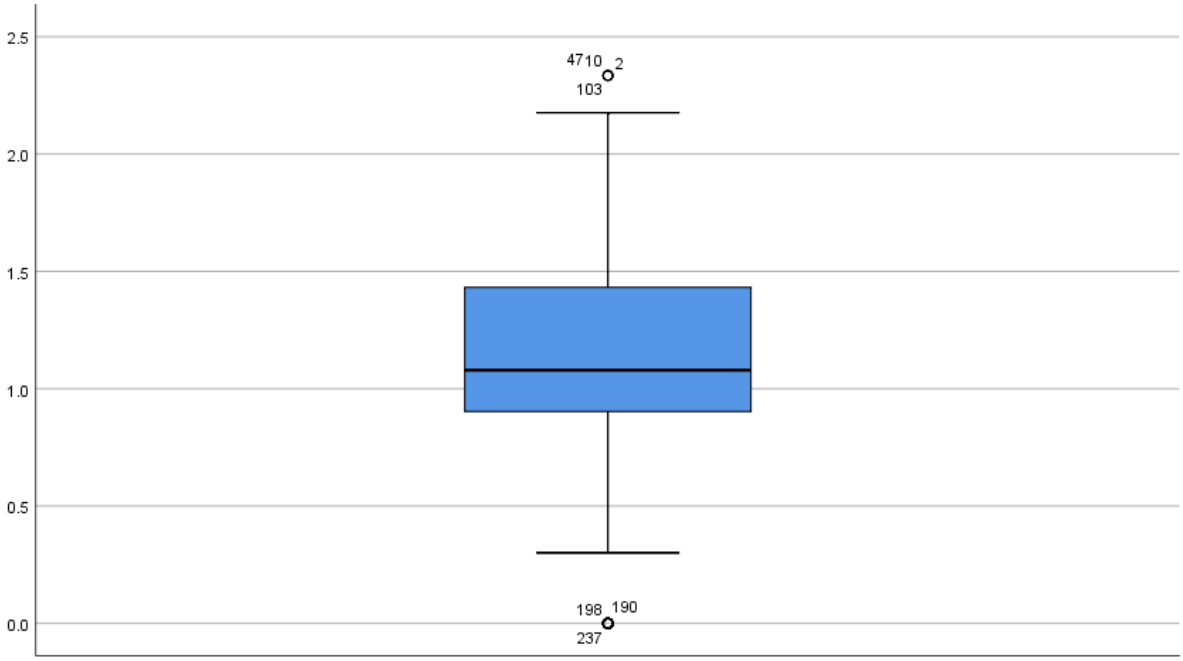


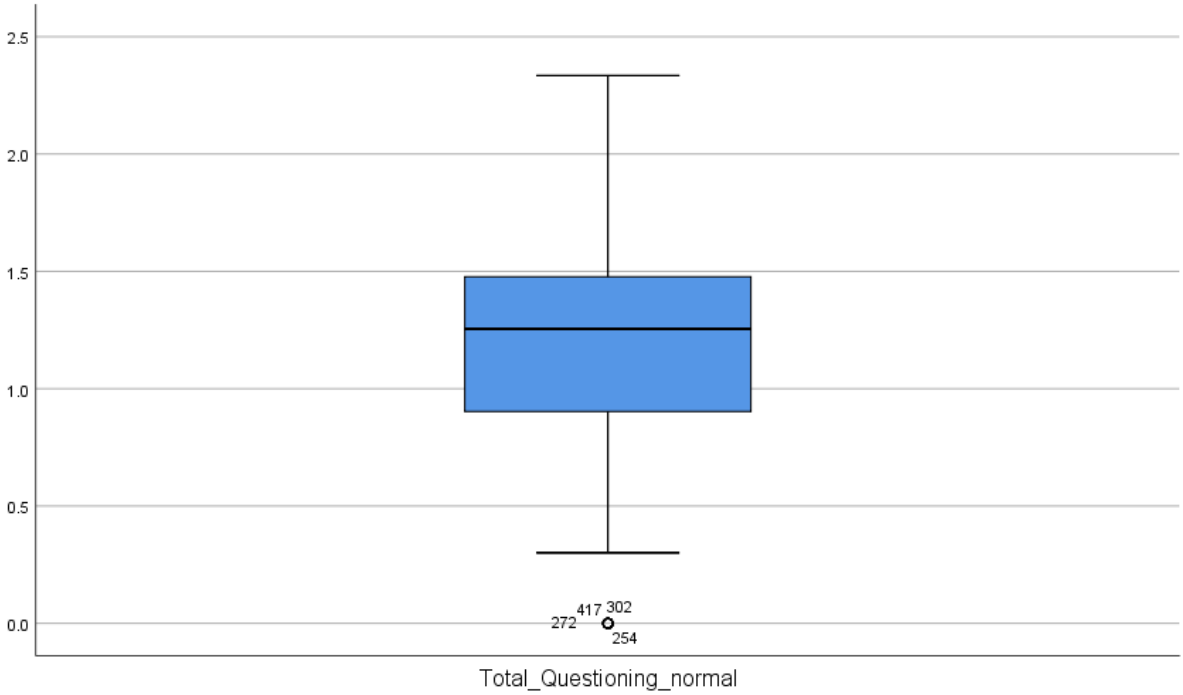

5
4
3
2
1
0
2
130
72
Total_self_efficacy_normal

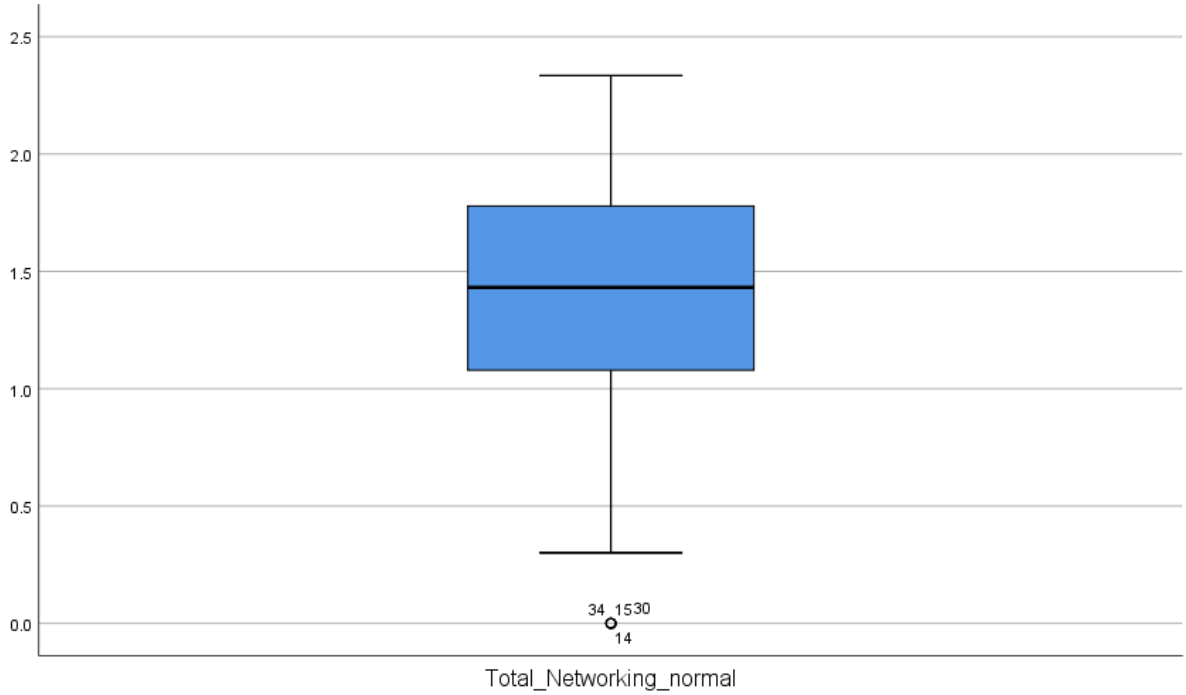

5
4
3
2
1
0
2
18
153
131
16
28208
27
136
35
7
Total_Optimism_normal

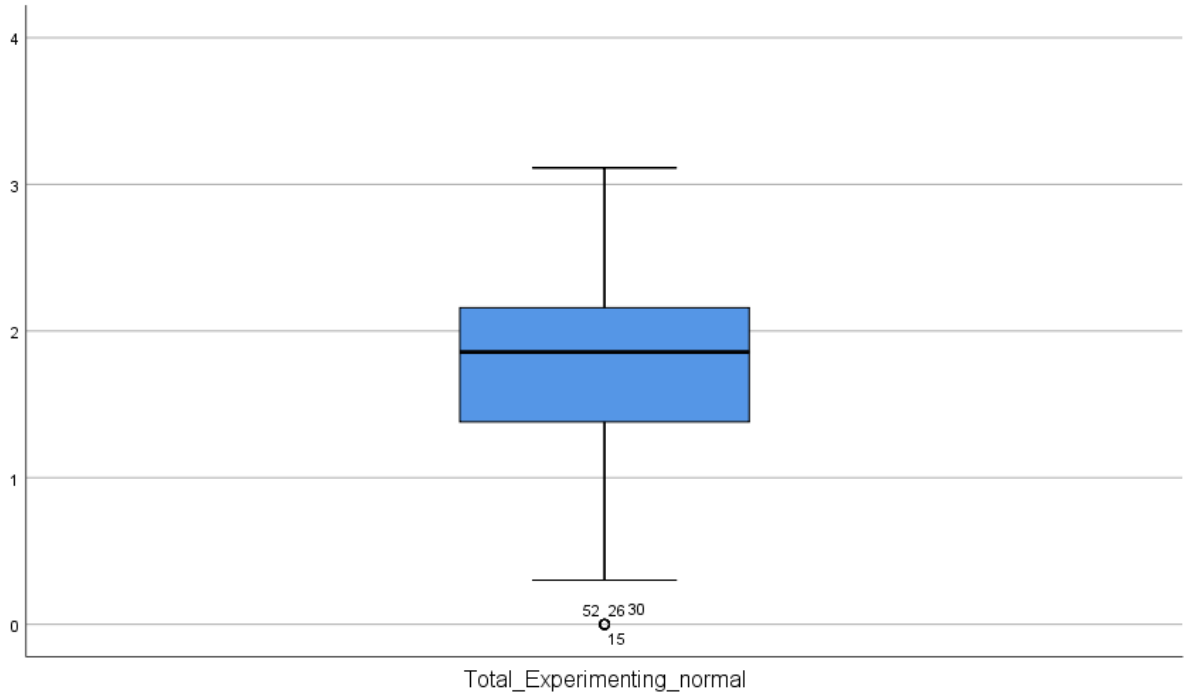

20
15
10
5
0
2
10
3
18
49
56
28
34
35
7
Total_PsyCap_normal

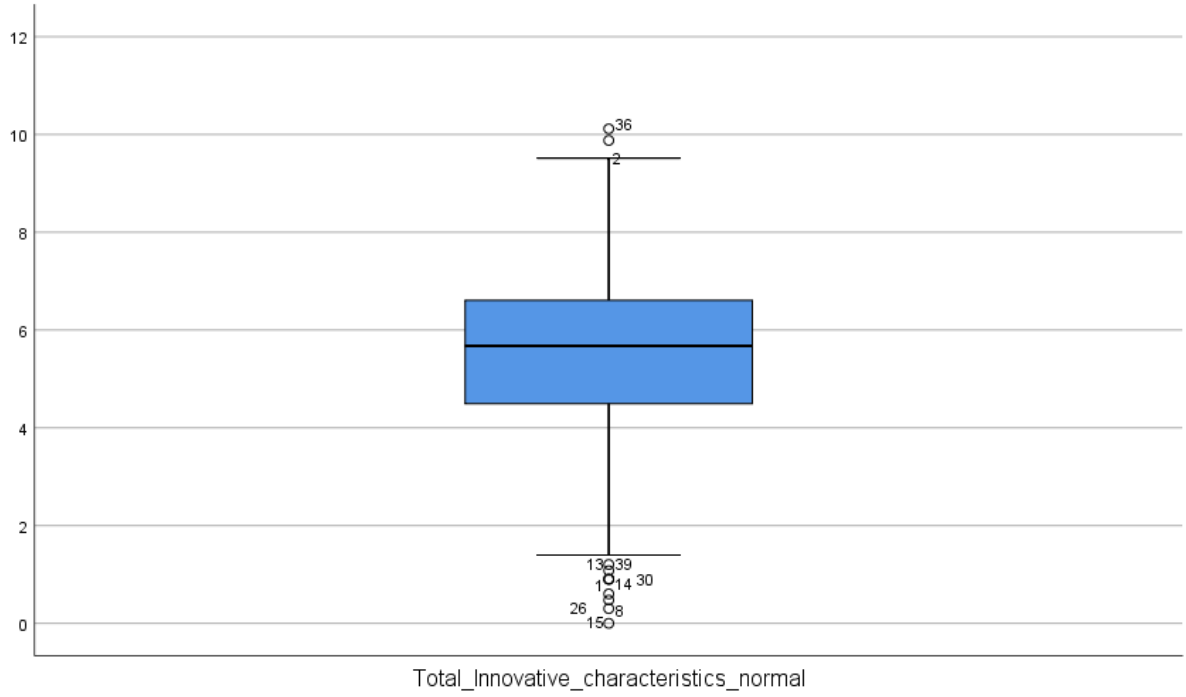

12
10
8
6
4
2
0
Total_Innovative_behaviour_normal

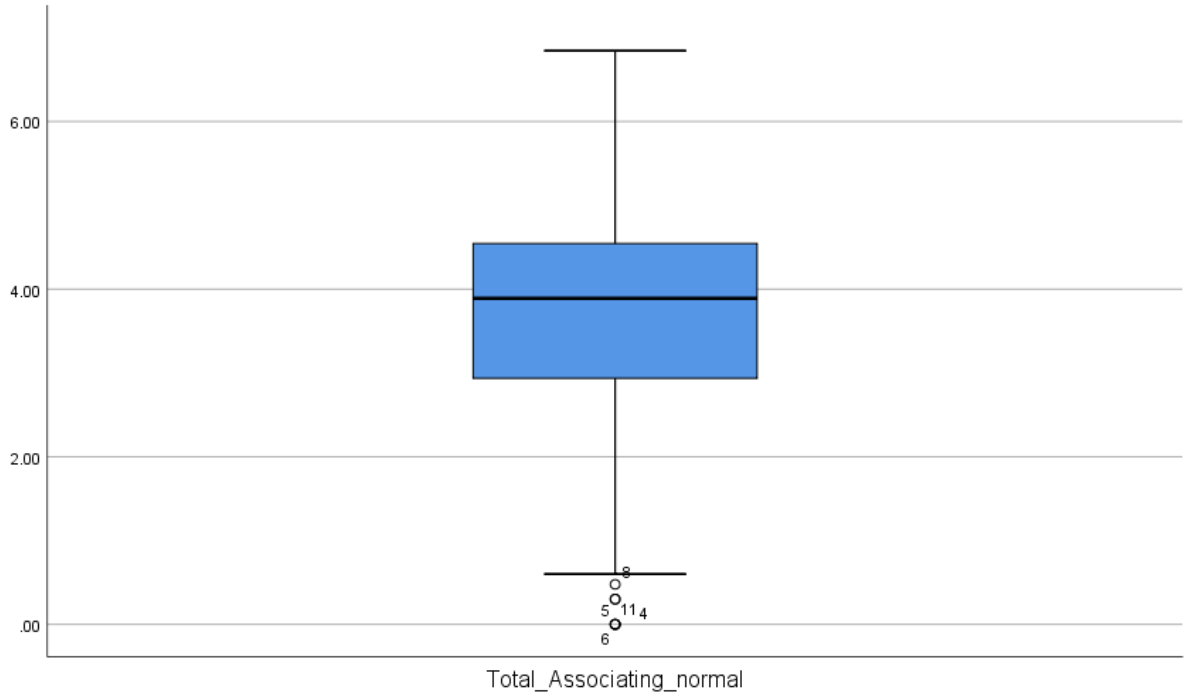

2.5
2.0
1.5
1.0
0.5
0.0
47
10
2
103
198
190
237
Total_Observing_normal


2.5
2.0
1.5
1.0
0.5
0.0
272
417
302
254
Total_Questioning_normal

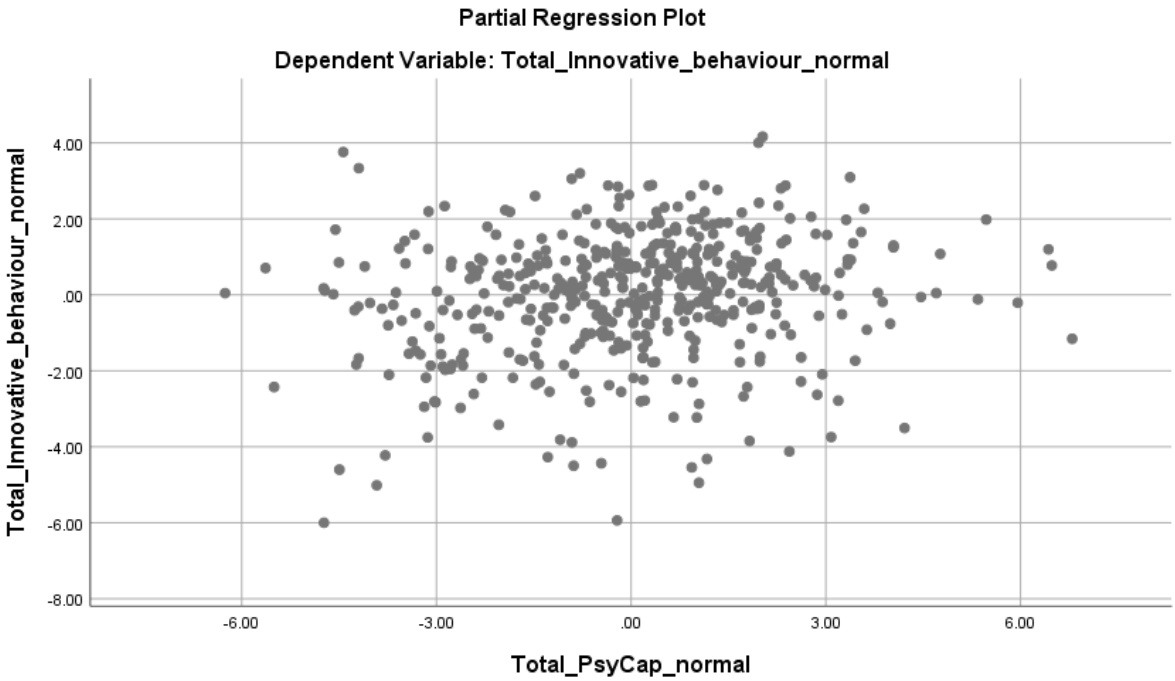

2.5
2.0
1.5
1.0
0.5
0.0
34 15 30
14
Total_Networking_normal

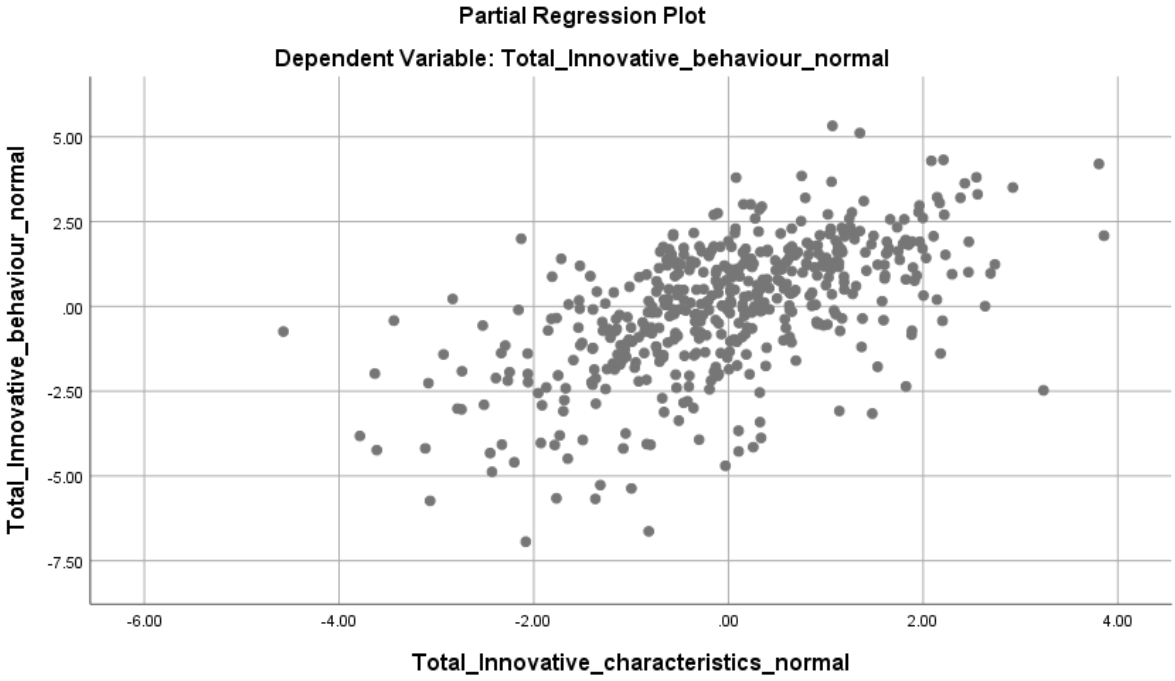

4
3
2
1
0
52 26 30
15
Total_Experimenting_normal

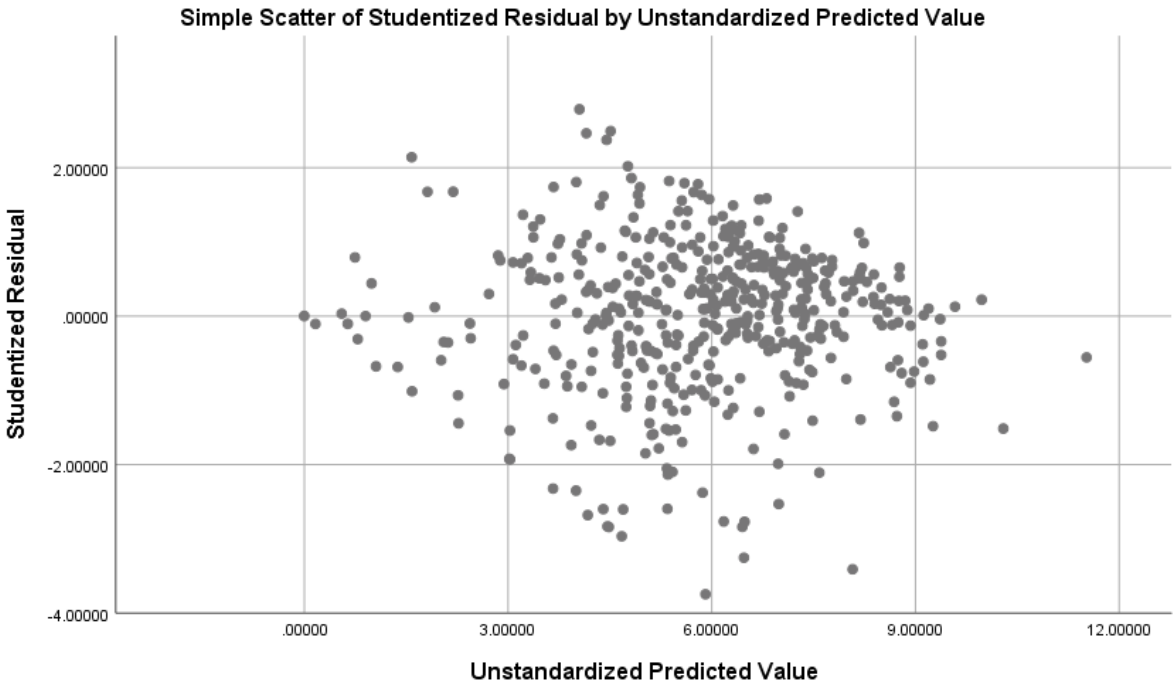

12
10
8
6
4
2
0
36
2
13
39
1
14
30
26
8
15
Total_Innovative_characteristics_normal

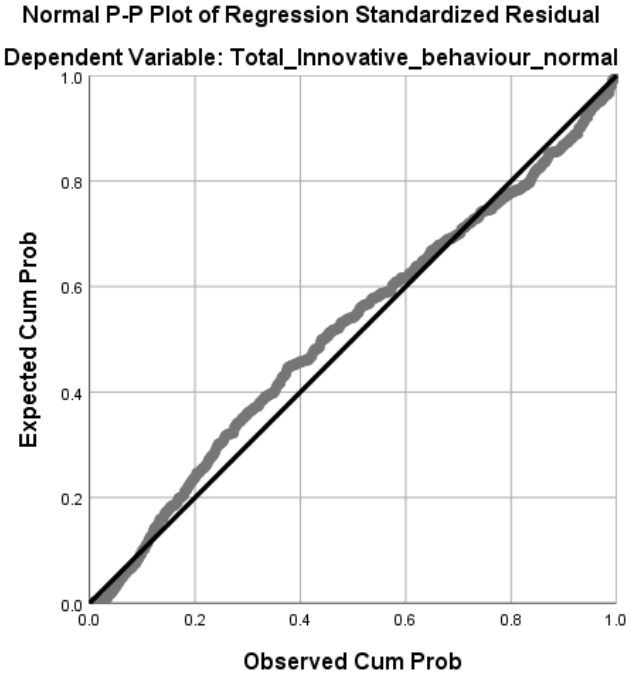

6.00
4.00
2.00
.00
8
5
11
4
6
Total_Associating_normal

Appendix J: Regression plots






Simple Scatter of Studentized Residual by Unstandardized Predicted Value
Studentized Residual
2.00000
.00000
-2.00000
-4.00000
.00000
3.00000
6.00000
9.00000
12.00000
Unstandardized Predicted Value


Normal P-P Plot of Regression Standardized Residual
Dependent Variable: Total_Innovative_behaviour_normal
Expected Cum Prob
0.0
0.2
0.4
0.6
0.8
1.0
Observed Cum Prob

Appendix K: Supervisee and Supervisor Contract

16. STATEMENT OF PRINCIPLES FOR POSTGRADUATE SUPERVISION

IN A CONTEXT OF ACADEMIC FREEDOM AND WITHIN A FRAMEWORK OF INDIVIDUAL AUTONOMY AND THE PURSUIT OF KNOWLEDGE THIS AGREEMENT IS WRITTEN IN THE BELIEF THAT THERE IS A RECIPROCAL RELATIONSHIP AND MUTUAL ACCOUNTABILITY BETWEEN SUPERVISOR AND STUDENT.

THE SUPERVISOR AND THE STUDENT:

1. Will establish agreed roles and clear processes to be maintained by both parties. In the case of joint supervision everyone's role needs to be clarified.
2. Will meet regularly and as frequently as is reasonable to ensure steady progress towards the completion of the proposal, research report, or dissertation or thesis. This time varies but the normal minimum requirement for face-to- face contact, spread across each year of registration is: 10 contact hours for an Honours project, 15 contact hours for a Masters by research report and 24 contact hours for a Masters by dissertation and a PhD.
3. Will keep appointments, be punctual and respond timeously to messages.
4. Will keep one another informed of any planned vacations or absences as well as changes in his or her personal circumstances that might impact on the work schedule. Unplanned absences or delays should be discussed as soon as possible and arrangements should be made to catch up lost time.
5. Will ensure that research on animal or human subjects is conducted according to the procedures and the requirements of the relevant University Ethics committee.
6. Will together complete progress reports on the research project, as requested by each Faculty Graduate Studies Committee.

THE SUPERVISOR:

1. Undertakes to provide guidance for the student's research project in relation to the design and scope of the project, the relevant literature and information sources, research methods and techniques and methods of data analysis.
2. Has a responsibility to be accessible to the student.
3. Will be prepared for meetings with the student. This includes being up-to-date on the latest work in his/her area of expertise.
4. Will expect written work as jointly agreed, and will return that work with constructive criticism within a timeframe (a suggestion of 2-4 weeks) jointly agreed at the outset of the research.
5. Will provide advice that can help the student to improve his/her writing. This may include referrals for language training and academic writing. The supervisor will provide guidance on technical aspects of writing such as referencing as well as on discipline specific requirements. Detailed correction of drafts and instruction in aspects of language and style are not the responsibility of the supervisor.
6. Will support the student in the production of a research report, dissertation or thesis. Provision should be allowed for adequate, mutually respectful, discussion around recommendations made.
7. Will assist with the construction of a written time schedule which outlines the expected completion dates of successive stages of the work.
8. Will ensure the student has the opportunity to present work at postgraduate/ staff seminars/national/international conferences as appropriate.
9. Will assist with the publication of research articles as appropriate.
10. Will discuss the ownership of research conducted by the student in accordance with the University guidelines and rules on intellectual property, co-authorship and copyright.
11. Will ensure that the research is conducted in accordance with the University's policy on plagiarism.
12. Will ensure that the student is made aware in writing of the inadequacy of progress and/or of any work where the standard is below par. Acceptability will be according to criteria previously supplied to the student.
13. Has a duty to refuse to allow the submission of sub-standard work for examination, regardless of the circumstances. If the student chooses to submit without the consent of the supervisor, then this should be clearly recorded and the appropriate procedures followed.

THE STUDENT:

1. Undertakes to work independently under the guidance of the supervisor. This includes reading widely to ensure that the literature pertinent to his/her chosen topic has been identified and consulted.
2. Is obliged to make appointments to see the supervisor and will arrange meeting times well in advance.
3. Will think carefully about how to derive maximum benefit from these contact sessions by planning what he/she wants in these sessions.
4. Should submit written work for discussion with the supervisor well in advance of a scheduled meeting. The kind and frequency of written work should be agreed with the supervisor at the outset of the research.
5. Undertakes to submit written work that is relatively free of basic spelling mistakes, incorrect punctuation and grammatical errors. Responsibility for the accuracy of language, the overall structure and coherence of the final research report, dissertation or thesis rests with the student.
6. Undertakes to heed the advice given by the supervisor and to engage in discussion around suggestions made. Ultimately the student has to take responsibility for the quality and presentation of the work.
7. Should strive, within reasonable bounds, to maintain a focus on his/her research area and to work within the agreed time schedule.
8. Will prepare material for presentations at seminars and conferences.
9. Undertakes to submit papers for publication.
10. Agrees to honour agreements about ownership of the research and in accordance with the University's guidelines and rules in relation to co-authorship, copyright and intellectual property.
11. Will ensure that the work contains no instances of plagiarism and that all citations are properly referenced and that the list of references is accurate, complete and consistent.
12. Agrees to work in accordance with the criteria of acceptability as supplied by the supervisor.
13. Undertakes not to place the supervisor under undue pressure to submit work for examination until the supervisor is satisfied that it has reached an acceptable level of quality.

I confirm that I have read and understood this statement and agree to be guided by its principles

Name of student : Nadia Criticos

Student's signature : NC

Name of Supervisor : Kora Milne

Supervisor's signature : KM

Name of Co-Supervisor :

Co-Supervisor's signature :

The broad area of study is: PsyCap and innovation

Provisional submission date is: 17 feb 2020

Degree : Masters of arts in organisational Psychology

School : Human and Community development

Faculty : Humanities

Date : 1 March 2019

Specific agreements pertaining to: ownership and joint publication, funding, etc. may be attached and signed.

GRIEVANCE PROCEDURES. It should be acknowledged that during the course of the research, both students and supervisors can feel aggrieved. In this event, matters should be dealt with as swiftly as possible by the parties involved and, if necessary,

Appendix L: Turnitin Report

Turnitin Originality Report

Processed on: 09-Feb-2020 11:20 AM SAST
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Word Count: 24697
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< 1% match (Internet from 24-Apr-2016)
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Submitted to University of Witwatersrand on 2015-04-14

< 1% match (publications)
Fred Luthans, Carolyn M. Youssef, Shannon L. Rawski. "A Tale of Two Paradigms: The Impact of Psychological Capital and Reinforcing Feedback on Problem Solving and Innovation", Journal of Organizational Behavior Management, 2011

< 1% match (student papers from 01-Mar-2014)
Submitted to University of Wales central institutions on 2014-03-01

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http://www.saibw.co.za/docs/2018Conference_Proceedings.pdf

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http://onlinelibrary.wiley.com/doi/10.1002/cjas.1314/full

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https://ahtmm.emu.edu.tr/Documents/previous-conferences/7th%20AHTMM%20Proceeding%20Book%20V4.pdf

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