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MASTERS DEGREE IN ORGANISATIONAL PSYCHOLOGY

Self-Reported Individual Innovative Behaviour, Individual Thinking Style, Organisational Climate for Innovation, and Leader-Member Exchange



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"A research report submitted in partial fulfilment of the requirements for the degree of Masters in Psychology by Coursework and Research Report in the field of Organisational Psychology in the Faculty of Humanities, University of the Witwatersrand, Johannesburg on 16 March 2015"

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."

Signature of Researcher: _____

Date: _____

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ABSTRACT

This research focused on the construct of self-reported individual innovative behaviour in order to provide a deeper understanding into the multi-dimensional construct of innovation within an organisation. This is because innovative behaviour within an organisation drives the organisation to achieve profit and success. The focus of this research was to consider the extent to which innovative behaviours were reported as being enacted within South African organisations; as well as organisational climate, leader-member exchange, and individual thinking styles in terms of how these factors were related to and/or predictive of individual innovation.

The final sample comprised 265 South African employees working within management, product development and/or design, consulting, strategizing, advertising, or marketing (in any field). The sample was collected through non-probability, volunteer, convenience sampling. All participants were asked to complete a questionnaire pack consisting of a Self-Developed, Self-Report Demographic Questionnaire, the Self Report Measure of Individual Innovative Behaviour, the Leadership-Member Exchange Questionnaire, the Climate for Innovation Measure, and the Thinking Style Inventory.

Statistical analyses indicated that participants of this study reported engaging more frequently in the conceptual (initial) phases of innovation and less frequently in the implementation (latter) phases of innovation. In terms of organisational climate, both organisational resources and organisational support were significantly related to innovative behaviour. Organisational resources also significantly predicted innovative behaviour whereas organisational support was not found to be a significant predictor of an employee's innovative tendencies. Although LMX was significantly related to innovative behaviour, it was only a significant predictor of innovative behaviour when it was grouped with the functions of thinking styles. Innovative behaviour was also significantly and positively related to anarchic, global, internal, external, legislative, judicial, hierarchical and liberal thinking styles; and the legislative, judicial, hierarchical, global, internal, external, and liberal thinking styles significantly and positively predicted innovative behaviour; while the executive thinking style significantly and negatively predicted innovative behaviour.

These results suggested that organisations who are striving to enhance their levels of innovative behaviour should be extremely mindful of their organisational climate for innovation, particularly the resources that are available to contribute to employees engaging in innovative

behaviour, as well as of the quality of their leaders' relationships with their subordinates and their workforce's thinking styles. These findings provide a starting point from which one can work to develop effective organisational interventions, such as training programs, and / or selection and recruitment strategies, to promote and enhance individual innovative behaviour and ultimately develop the organisation.

Key words: Individual innovative behaviour, individual thinking style, organisational climate for innovation, leader-member exchange.

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CHAPTER ONE: LITERATURE REVIEW

Introduction

Innovation, the purposeful introduction and application of novelty, is pivotal to organisations being able to sustain a competitive advantage and thus remaining successful (Anderson & West, 1998; Gumusluoglu & Ilsev, 2009; Morgan, 2006; Oldham & Cummings, 1996; Xerri & Brunetto, 2011). Discovering and implementing new and exciting strategies sets an organisation above the rest and provides them with a platform from which they can build and develop (Gumusluoglu & Ilsev, 2009; Oldham & Cummings, 1996). Ultimately, this platform has the power to deliver the organisation's vision of growing profitability (Geroski, Machin, & Van Reenen, 1993; West & Altink, 1996; Xerri & Brunetto, 2011). Although there is a lot of research on innovation, the processes that underlie and develop innovative behaviour are not entirely defined or understood. Therefore innovation as a construct is worthy of further consideration and investigation. Moreover, individual innovation is a key aspect of this because organisational innovation typically begins with an individual's engagement in innovative behaviour (Hitt, Bierman, Shimizu, & Kochhar, 2001; Kheng & Mahmood, 2013; Rothaermel & Hess, 2007; Tierney, Famer, & Graen, 1999). As such, understanding the factors that contribute to individuals engaging in innovative behaviour within their work environment is pivotal.

In terms of available research, including the model proposed by Scott and Bruce (1994), there are various factors that contribute to individual innovative behaviour, including the psychological climate for innovation within the organisation, leadership within the organisation, and certain individual attributes of the employee (Kheng & Mahmood, 2013; Oldham & Cummings, 1996; Sanders, Moorkamp, Torka, Groenveld, & Groenveld, 2010; Sternberg & Wagner, 1991; Zhang, 2004). This research considers individual innovative behaviour within the South African context in terms of how it may be associated with and potentially predicted by the organisation's climate for innovation (in terms of their support and the resources provided for encouraging innovative behaviour among employees), the quality of the leader-member exchange relationship individual employees have with their supervisors (in terms of allowing for and encouraging individual innovative behaviour), and employees' individual thinking styles (in terms of initiating individual innovative behaviour).

This study will therefore attempt to confirm the nature of the relationship between individual innovative behaviour and climate for innovation, an environmental factor that has been shown to influence individual innovative behaviour (Martins & Terblanche, 2003; Oldham & Cummings, 1996; Scott & Bruce, 1994; Shneiderman, 2007; Sternberg, 2006; Tierney et al., 1999). This is because the organisational climate in which employees work can facilitate or inhibit on-the-job creativity (Ekvall, 1996; Klein & Sorra, 1996; Oldham & Cummings, 1996; Shneiderman, 2007; van der Sluis, 2004). Thus if the nature of the relationship between organisational climate and individual innovative behaviour can be confirmed through empirical research and further unpacked to provide for a more meaningful understanding, organisations will be able to see the importance of creating an organisational climate wherein innovative behaviour is nurtured, encouraged, and rewarded (Amabile, 1988; Scott & Bruce, 1994).

The study will also attempt to confirm the nature of the relationship between quality of leader-member exchange, as proposed by leader-member exchange theory (Graen & Uhl-Bien, 1995), and individual innovative behaviour. In terms of this theory, the behaviour in which an employee engages will strongly depend on the relationship the employee has with his supervisor and the autonomy and decision latitude the supervisor affords to his employee. In line with this, the employee's engagement in innovative behaviour will be strongly influenced by his supervisor. Quality of leader-member exchange is a leadership factor that has been shown to influence individual innovative behaviour in previous research (c.f. Graen & Uhl-Bien, 1995; Kheng & Mahmood, 2013; Sanders et al., 2010; Schermuly, Meyer, & Dämmer, 2013; Scott & Bruce, 1994) and as such, gaining a more in-depth understanding of this relationship and whether leader-member exchange can predict innovative behaviour could provide useful information for organisations to apply to enhance the innovative tendencies of their employees and thus their success.

In addition, one particular individual attribute that has been tentatively linked to individual innovative behaviour is that of problem solving style (an individual's cognition) however the nature of this link has not been deeply explored or clarified (Clegg, Unsworth, Epitropaki & Parker, 2002; Riding & Wigley, 1997; Sadler-Smith & Badger, 1998; Scott & Bruce, 1994). Problem solving style refers to the way in which an individual approaches and reacts to a particular situation or problem. This tends to differ between individuals depending on the cognitive style from which the individual is operating. In terms of the theory of mental self-government, there are many ways in which an individual can govern and manage their activities and these different ways are understood as different thinking styles (Bernado, Zhang, &

Callueng, 2002; Sternberg, 1998; Sternberg & Wagner, 1991; Zhang, 2004). Thinking styles can be flexible and thus in terms of this theory, one uses one's thinking patterns to adjust to one's environment because one particular thinking style can benefit an individual within one context yet compromise them within another context.

Although there is research available pertaining to the relationship between individual innovation and the thinking styles construct (Clegg et al., 2002; Ettlie, Groves, Vance, & Hess, 2014; Miron-Spektor, Erez, & Naveh, 2011; Riding & Wigley, 1997; Scott & Bruce, 1994; Wu, Parker, & de Jong, 2014), this research appears to be very broad in terms of an individual's cognition and less focused on thinking styles specifically. If particular thinking styles can be found to be associated with or even predict innovative behaviour, organisations will be able to either strive to recruit employees with favourable innovative tendencies or alternatively train employees to adopt a particular style of thinking in order to stimulate them to engage in innovative behaviour. As such, this study will attempt to explore the nature of this relationship.

Overall, this research therefore aims to contribute further to the theoretical understanding of self-reported individual innovation through establishing which of the above mentioned factors (namely climate for innovation, leader-member exchange quality, and thinking style) are related to and can predict individual innovative behaviour in a South African sample. Furthermore, innovation as a field of study appears to be under-researched within the South African context and thus this research will contribute further to understanding self-perceived individual innovation in a relatively unique context. Moreover, it is argued that a deeper understanding of the construct of self-reported individual innovation may inform the development of interventions to encourage individual innovative behaviour, which is a key factor in ensuring continued organisational success (Oldham & Cummings, 1996).

In line with the above, this research aimed to investigate which innovative practices were reported most frequently in a South African sample. In addition the research aimed to explore the nature of the relationships between self-reported individual innovative behaviour, organisational climate for innovation (climate-based/ external), quality of leader-member exchange (leadership/ external), and individual thinking styles (individual/ internal); and to what extent (if at all) the enactment of self-reported individual innovative behaviour within a South African context could be predicted by organisational climate for innovation, quality of leader-member exchange, and individual thinking styles as reported in the sample.

Innovation in organisations

One key to consistent organisational success lies in the largely-researched organisational construct of innovation (Anderson, De Dreu, & Nijstad, 2004; Gumusluoglu & Ilsev, 2009; Hammond, Neff, Farr, Schwall, & Zhao, 2011; Morgan, 2006; West, 2002; Xerri & Brunetto, 2011). Innovation stems out of creativity in that it is the successful implementation of a creative and novel idea (Amabile, 1996; Patterson, 2004; Scott & Bruce, 1994). Although the two constructs can be individually defined, the difference between them is often confused within the literature (Patterson, Kerrin, & Gatto-Roissard, 2009; Scott & Bruce, 1994). Technically, creativity is the fundamental precursor of innovation (Shalley, 1991; Pirola-Merlo & Mann, 2004) however, for the purposes of this research, the understanding of the innovation construct will not be technically differentiated and will be broadly defined using the basis of the understanding of both terms.

Innovation can holistically be defined as the purposeful introduction and application of a novel idea, process, product, or procedure that is designed to substantially benefit the performance of the individual, the group, the organisation, the wider society, or all of the aforementioned (Anderson, Potocnik, & Zhou, 2014; Anderson & West, 1998). According to West and Altink (1996), in the context of an organisation the importance and benefit of novel and fresh ideas can never be exaggerated because innovation plays a central role in the survival and success of an organisation (Anderson et al., 2014; Hammond et al., 2011; Oldham & Cummings, 1996; Patterson et al., 2009; Xerri & Brunetto, 2011); and the process of achieving organisational success and a competitive advantage usually begins with an individual because ‘individual creativity is the building block for organizational innovation’ (Tierney et al., 1999, p. 591). Furthermore, according to Scott & Bruce (1994), it is people who expand, carry out, respond to, and adapt new ideas, and thus studies that focus on what motivates individuals to engage in innovative behaviour are essential and can be highly beneficial.

Organisations whose employees consistently and frequently engage in innovative behaviour are likely to have an advantage over their competitors in that they are constantly trying to adapt and improve so that optimal success can be attained (Beckman & Barry, 2007). For example, according to the self-reported individual innovative behaviour scale developed by Kleysen and Street (2001), innovative behaviour consists of an individual who ‘looks for opportunities to improve an existing process, technology, product, service, or work relationship’ and those who ‘recognise opportunities to make a positive difference in [their] work, department,

organisation, or with customers' as well as individuals who look to 'generate ideas and solutions to address problems'. Generating ideas, looking for and recognising opportunities to improve, and making a positive difference are all behaviours that speak to individuals acting to assist the process of adapting and improving organisational functioning so that the organisation can reach its highest level of successful performance (Anderson et al., 2014; Axtell, Holman, Unsworth, Wall, Waterson, & Harrington, 2000; de Jong & Hartog, 2007). Individuals who go further to 'test out [these] ideas and solutions' and 'work the bugs out of new approaches when applying them to an existing process, technology, product, or service' display this type of behaviour in order to enhance the current outcomes of the organisation as well as to try to overcome the organisation's weaknesses. This is done so that the organisation is not outperformed by competitors and is able to maximise profitability and efficacy (Anderson et al., 2014; Anderson et al., 2004; West, 2002).

The holistic innovative process is a complex and multidimensional process that requires various tools as well as support structures. This extends to and includes sponsorships as well as individuals who support and believe in the idea (Scott & Bruce, 1994). It is important to note that the innovation process is fluid and progresses in a non-linear fashion (King, 1992). In other words, there are no concrete rules as to how innovation occurs, rather it is argued that the overall general process involves an intertwined amalgamation of individuals working independently or within a team to identify problems, create solutions for these problems, and generate support for these solutions (Subramaniam & Youndt, 2005).

Bearing the above in mind, the foundation of this process rests within the various individuals who actualise the different stages or phases of this process. As such, based on the above examples, individual innovative behaviour in the workplace can be considered as the cognitive and behavioural tendencies of an employee's engagement with the different aspects and phases of the innovative process, specifically the progression of how and why an individual initially develops the spark of an innovative idea, how this idea matures and advances, and eventually how it is translated successfully into a novel beneficial development for the organisation (Anderson et al., 2014; King, 1992; Scott & Bruce, 1994; Subramaniam & Youndt, 2005; West, 2002).

The importance of the individual within an organisation's model of successful innovation therefore lies in the process of innovation, which is a knowledge-intensive process driven by individuals; and individual innovative behaviour can be understood as a dominant pillar of

high-performing organisations (Carmeli, Meitar, & Weisberg, 2006; Hitt et al., 2001; Kheng & Mahmood, 2013; Rothaermel & Hess, 2007). Stemming from research by Carmeli et al. (2006), Patterson et al. (2009), and Yesil and Sozbilir (2013), it has been suggested that in order to ensure an organisation's engagement in and production of innovative behaviour, the organisation should pay careful attention to their human resources. This is because innovations are derived from the ideas that originate within the individuals of the organisation's workforce and are therefore at least partly the result of the quality of the organisation's human capital in terms of talent and skills (Gardner, 2005). In line with Bharadwaj and Menson (2000) and Sousa and Coelho (2011), organisations depend on their employees for creative ideas and efforts. In this way it is argued that the individual employees of an organisation are a pivotal starting point to explore the multidimensional construct of innovation within the organisation. If the underlying antecedents that motivate and develop individual innovative tendencies can be ascertained and meaningfully understood, individual innovative behaviour can be enhanced; which could ultimately result in greater organisational innovation leading to increased desirable outcomes (Axtell et al., 2000; de Jong & Hartog, 2007; Sander, Moorkamp, Torka, Groenveld, & Groenveld , 2010; Unsworth & Parker, 2003).

As a result, the importance of determining the motivators that enable individual innovative behaviour is argued to significantly contribute towards further understanding organisational innovation and success (Carmeli et al., 2006; Scott & Bruce, 1994; Yesil & Sozbilir, 2013). Since it is difficult to accurately measure individual innovative behaviour (in terms of the individual's actual engagement within the different aspects and phases of the innovative process, as has been defined above), this research focuses on the construct of self-reported individual innovative behaviour.

Factors influencing individual innovative behaviour

Past research has highlighted a number of factors that have been shown to influence individual innovation. Ramamoorthy, Flood, Slattery, and Sardessai (2005) found that the psychological contract of perceived obligation to innovate as well as job autonomy and pay have direct effects on innovative work behaviour. The organisation's policies as well as their resources and historical and social beliefs may also influence innovation tendencies (Nelson, 1993). Nelson (1993) also found that effective innovative performance was seen in those individuals who possessed high-quality education, training, and strong core competencies. Sadler-Smith and

Badger (1998), as well as Gardner (2005), argue that an organisation's human resource department and managers have a vital impact on employees' innovative tendencies. A study conducted by Martins and Terblanche (2003) explored organisational culture and the determinants thereof and looked at how these factors encourage innovation, including strategy, structure, support mechanisms, certain types of behaviours, open communication, values, norms, and beliefs. The work environment was also found to be related to innovation within the organisation (Balridge & Burnham, 1975). Within the literature, it therefore seems as though the various factors associated with individual innovation can be framed as focusing on either internal or external elements that ultimately affect an individual's innovative tendencies.

In line with the research of Egan (2005), Oldham & Cummings (1996), Shalley (1991), Taggar (2002), and Tierney et al. (1999), it can be argued that the driving forces of employees' creative performances are largely due to the personal characteristics and qualities of the individual. In other words, a large amount of research attempts to define the innate 'creative personality'. Various ideas have been considered in exploring this concept (Costa & McCrae, 1995; Egan, 2005; Taggar, 2002), however generally speaking, the creative personality comprises various traits and usually stems out of personality characteristics that are related to an individual being independent, self-disciplined, orientated toward risk-taking, able to persevere in the face of frustration, and relatively unconcerned about whether they receive or do not receive social approval (Amabile, 1996). Patterson et al. (2009) argue that openness is also a personality trait that has been found to be a key predictor of innovation (Batey & Furnham, 2006; Harrison, Neff, Schwall, & Zhao, 2006; Patterson, 2002; Wolfradt & Pretz, 2001). Furthermore, in terms of Oldham and Cummings (1996), the personal characteristics of a creative individual also include but are not limited to intuition, aesthetic sensitivity, and self-confidence, as well as the individual generally having broad interests and a tolerance for ambiguity.

However, it is imperative to note that innovation and creativity do not occur in isolation; instead innovation is as a result of the individual interacting with the environment (Patterson et al., 2009; Shneiderman, 2007). There are many environmental influences which can affect an individual's innovative resources; however from an industrial psychological perspective the focus of these environmental influences is centred around the organisation, as well as how the organisation as an external influence on the individual can enhance and nurture innovative inclinations. Oldham and Cummings (1996) propose that the organisation should avoid operating in such a way whereby their employees' excitement in their work activities becomes reduced as a result of them feeling restricted and constrained, ultimately stifling their creative

abilities; instead, organisations should promote and support individual innovation through strategic planning that will allow for the innate creative personalities of their employees to easily be expressed, enhanced, and nurtured (Shalley, 1991). As a result it is argued that innovative behaviour emerges through interactions between individuals who possess internal innovative personality characteristics and their operating context (Hammond et al., 2011; Tierney et al., 1999; Unsworth & Parker, 2003).

In line with the above, it is clear that both internal and external factors can enhance or inhibit an individual's creative performance (Ford, 1996; Hsu & Fan, 2010; Janssen, 2005; Oldham & Cummings, 1996; Pirola-Merlo & Mann, 2004; Unsworth & Parker, 2003). Two theories that suggest how internal and external contributing factors may integrate to influence individual innovation are Amabile's (1996) componential model of creativity and Sternberg's (2006) investment theory.

The componential model of creativity

The componential model of creativity by Amabile (1996) includes both person and work environmental variables and firstly proposes that creativity is the result of three different components: expertise, which includes an individual's factual knowledge, technical proficiency, and special talents within the target work domain; creative thinking, which provides the 'newness' giving the creative performance and thinking skills within the target work domain an extra edge; and task motivation, which determines whether the individual will actually carry out the task to meet the target within the work domain (Amabile, 1996; 2013). In a study by Conti, Coon, and Amabile (1996) it was established empirically that the three components proposed within Amabile's model (expertise, creative thinking, and task motivation) contributed to individual creative behaviour through correlating multiple measures of creativity completed by the same person and showing a pattern of associations.

Expertise is viewed as a set of internal cognitive pathways that allow the individual to creatively solve problems (Amabile, 1996). Similarly, creative thinking is an internal cognitive style that favours taking on new perspectives to a given problem thus allowing for one's working style to compliment a persistent, energetic pursuit of one's work (Amabile, 1996; 2013). Task motivation, on the other hand, is understood to be split into two forms. Intrinsic task motivation is where internal motivational forces (seen in deep interest and involvement in

work or in one's curiosity, enjoyment, or personal sense of challenge from the work) can be seen to influence creativity whereas extrinsic task motivation is the desire to achieve a creative goal as a result of attaining an external reward such as winning a competition or receiving a remuneration bonus (Amabile, 1996; 2013).

Secondly, the model proposes that the external work environmental influences that act upon a creative individual are vital and strongly affect the creativity that they eventually produce. Thus the social environment is seen to directly impact individual components of creativity (Amabile, 1996).

Organisational motivation is an environmental factor that refers to the organisation's attitude and approach towards creativity and innovation; and how the organisation provides for and supports the creativity of their employees (Amabile, 1996). Ideally, the organisation should place considerable value on creativity and innovation, orientate themselves towards taking risks, develop a sense of pride in the organisation's members and enthusiasm for their capabilities, and strategise to lead to future developments (Amabile, 1996). The second environmental influence is the organisation's resources, which need to be able to be relied upon to assist their employees to ultimately achieve their creative targets (Amabile, 1996). These resources include but are not limited to: providing sufficient time and funds to produce creative ideas; making relevant information available; making training available; and making material resources available (Amabile, 1996). The third component, management practices, refers to the way in which management manage the individual employees within their respective departments as well as the organisation at a holistic level (Amabile, 1996). Managers need to allow for opportunities for successful creativity by providing employees with a sufficient degree of freedom and autonomy; by appropriately matching work assignments with specific individuals in terms of those individuals' skills and interests; and by ensuring project supervision results in clear planning, constructive feedback, good communication between the individuals and their supervisors, and enthusiastic support for the work of the individuals (Amabile, 1996).

Thus the componential model accounts for how both internal and external elements of creativity are related and combine to develop innovations (Amabile, 1996) (please refer to Figure 1 in Appendix M for a diagrammatic representation of the componential model). The model also proposes that whilst the environment impacts individual creativity, this creativity (produced as a result of an individual's internal attributes) serves as the starting point and key

resource upon which the organisation needs to rely in order for the organisation to develop successful innovations and remain competitive (Amabile, 1996).

Investment theory

The investment theory of creativity, explained in Sternberg (2006), also supports the argument that creativity is a confluence of various factors that together allow a creative individual to buy low, by pursuing ideas that are unknown or not popular, and sell high, by growing the potential of these unknown ideas and consequently reaping the benefits (Sternberg, 2006). According to the investment theory, the creative individual requires the convergence of six distinct but interconnected resources (Sternberg, 2006).

The first resource is the confluence of three types of intellectual skills. Firstly the synthetic skill prevents one from being confined to conventional thinking and thus allows one to see problems in new ways; the analytic skill provides for the ability to recognise which of one's ideas are worth pursuing and which are not worth pursuing; and the practical-contextual skill allows one to persuade or sell the value of one's idea to others. The interaction of these three intellectual skills provides for optimal creative thinking to occur (Sternberg, 2006). The next resource for creativity is knowledge. This is imperative as knowledge is required in order to understand where boundaries can be pushed however this knowledge can also result in a closed and entrenched perspective of a particular field where one is unable to extend the field past what has previously existed thus it is a resource that needs to be utilised carefully (Sternberg, 2006). The third resource of creativity is thinking styles, which is similar to the cognitive styles factor mentioned above. This resource refers to the decisions one makes regarding how to utilise the skills that are available to them (Sternberg, 2006). According to Sternberg (2006), the legislative style of thinking is highly significant for a creative mind because an individual who employs this style of thinking has a preference to think in new ways (Sternberg, 2006). Creative individuals also tend to approach any situation by considering it in both a global and local sense (Sternberg, 2006).

The fourth resource is personality. As has been explained in detail above, this resource refers to the various attributes of an individual that innately encourage them to *decide* to defy the crowd, stand up to conventions, and develop new ideas (Sternberg, 2006). The fifth resource is motivation, which has also been considered above and which speaks to both the internal and

external forces that drive creativity (Sternberg, 2006). The last resource of the investment theory is the environment. This resource is of vital importance because it explains that 'one could have all of the internal resources needed to think creatively, but without some environmental support (such as a forum for proposing those ideas), the creativity that a person has within him or her might never be displayed' (Sternberg, 2006, p. 89). In other words, creativity results from the combination of the innate essence of the individual and the context within which the individual operates. Thus the organisation must provide for an environment which supports and rewards creative ideas.

In terms of the investment theory, it is important to understand that creativity does not merely involve the existence of all six dimensions; instead the dimensions may interact with each other in various ways (Sternberg, 2006). Firstly, if a particular component, such as knowledge, has a threshold, and the level of that component is below this threshold; creativity may not be possible regardless of how high the levels of the other components are (Sternberg, 2006). Moreover, partial compensation may occur. This is when the level of one component, such as motivation, is extremely high and compensates for the low level of another component, such as the environment (Sternberg, 2006). This compensation ultimately allows for creativity to still emerge. Another type of interaction that may occur between two components of the theory is when the levels of both components are high and thus result in creativity becoming multiplicatively enhanced (Sternberg, 2006).

In line with the above it is argued that both of these theories support the importance of considering both individual and contextual factors when attempting to explain individual innovative behaviour. Both the individual and contextual factors are encapsulated in the model proposed by Scott and Bruce (1994) which provides a relatively detailed account of which specific environmental and individual factors have been found to influence individual innovative behaviour in the organisational context.

Scott and Bruce's model of individual innovative behaviour

In their model of individual innovative behaviour, Scott and Bruce (1994) considered four broad determinants of innovative behaviour, namely: characteristics of the individual (defined as an individual's intuitive and systematic problem-solving style); leadership (defined as leader-member exchange and leader role expectations); operational work groups (defined as

team-member exchange); and the climate of the organisation (defined as support for innovation and resource supply). Using correlations and a structural path analysis, Scott and Bruce (1994) established that support for innovation (a dimension of organisational climate); quality of leader-member exchange; and role expectations were all associated with increased individual innovative behaviour; while systematic problem-solving style was negatively associated with increased individual innovative behaviour. Resource supply (a dimension of organisational climate); team-member exchange; and intuitive problem-solving style were not found to be significantly linked to increased individual innovative behaviour. In line with these findings it appears that the climate and leadership of an organisation as well as the cognitive styles of the individuals who make up the organisation in some way each contribute to determining innovative behaviour within the organisation.

In light of the above, it is argued that there are many factors that can be ascribed to determining the important and influential construct of individual innovation within the workplace. In line with the literature suggesting the significance of both internal and external factors found to encourage individual innovative behaviour, it is argued that there is a high degree of importance in considering organisational climate; quality of leader-member exchange; and personal thinking style as three potential key factors that can be ascribed to determining individual innovation. This has been informed by the organisational and personal factors (as suggested by Amabile (1996)), as well as cognitive/thinking styles and environmental factors (as outlined by Sternberg (2006)) and has been focused more tightly by Scott and Bruce's (1994) findings.

Innovation and organisational climate

One extremely important determinant of innovative behaviour is the climate of the organisation (Amabile, 1996; Martins & Terblanche, 2003; Nelson, 1993; Scott & Bruce, 1994; Sternberg, 2006). This can be understood as the way in which an employee cognitively represents their organisational setting and expresses this representation to reflect a psychologically meaningful understanding of the situation. In other words, an organisational climate refers to an employee's work-group relations and the dynamics surrounding these relations (Hunter, Bedell, & Mumford, 2005; 2007; Mathisen & Einarsen, 2004; Scott & Bruce, 1994).

The organisational climate is an important determinant of innovative behaviour because the work environment in which one works heavily influences employee behaviour and work habits

(Hunter et al., 2007; Oldham & Cummings, 1996; Tierney et al., 1999); thus the organisational climate of an organisation can facilitate or inhibit on-the-job creative behaviour; and a nurturing organisational climate can provide for innovation of a heightened and consistent quality (Ekvall, 1996; Klein & Sorra, 1996; Oldham & Cummings, 1996; Shneiderman, 2007; van der Sluis, 2004). If the nature and ethos of an organisation are such that attention and activities engaged in are directed toward innovation, the organisational climate begins to be centred on encouraging and rewarding employee innovative behaviour, and leads to a greater tendency among employees to engage in innovative behaviour (Amabile, 1988; Scott & Bruce, 1994). The importance of the environment / climate of the organisation is also emphasised in both Amabile's (1996) model and Sternberg's (2006) theory.

The relationship between organisational climate and innovation has been considered in terms of various aspects of the construct of organisational climate within the literature**.** Damanpour (1991) considered the relationship between innovation and communication and found that innovative behaviour was positively associated with internal and external communication. Ahmed (1998) considered the nature of organisational climate and its relationship to innovation in terms of various organisational factors that could promote innovation. Hunter et al. (2007) examined 42 prior studies that explored the relationship between aspects of climate (such as support and autonomy) and creative performance and found that these were effective predictors of creative performance in turbulent, high pressure competitive environments, such as organisations.

It is important to note that within the literature, there is a strong overlap between discussions of culture and climate given how climate has been defined in this research. A recent study by Martin and Terblanch (2003) found that innovation was stimulated by the organisational culture in terms of support mechanisms, structure, strategy, and behaviour (which overlap with organisational climate). Yuan and Woodman (2010) also found a relationship between innovation and perceived organisational support. Moreover, Naranjo-Valencia, Jimenez-Jimenez, and Sanz-Valle (2011) found that organisational culture, as defined by the values, beliefs, and hidden assumptions of the organisation's employees, is a clear determinant of innovation. Furthermore, within the research conducted by Chien, Tsai, and Chin (2013) as well as by Kheng and Mahmood (2013), the innovative climate of an organisation was found to be positively associated with innovative behaviour. Time pressure, another factor of organisational climate, was also found to be related to innovation tendencies (Hsu & Fan, 2010). Another study by Hammond et al. (2011) considered the relationships that

environmental factors such as organisational climate, organisational resources, and different types of support offered that could ultimately facilitate innovative behaviour. These factors were found to have significant positive relationships.

Innovation and leadership

Another important factor that has been linked to individual innovative behaviour is the construct of leadership (Oldham & Cummings, 1996; Redmond, Mumford, & Teach, 1993). One theory of leadership that has been proposed as linking closely to innovation is leader-member exchange theory (Graen & Uhl-Bien, 1995; Scott & Bruce, 1994). The leader-member exchange theory focuses on the dyadic relationship between a leader and a member (Gerstner & Day, 1997; Graen & Uhl-Bien, 1995). The essence of this theory is that the quality of the relationship between a leader and a follower strongly influences and actually predicts outcomes at an individual, group, and organisational level (Dansereau, Graen, & Haga, 1975; Graen & Scandura, 1987; Graen & Uhl-Bien, 1995). The theory proposes that supervisors and subordinates develop a relationship where they reach an understanding of what role each requires the other to perform. This role refers to the amount of influence, autonomy, and decision latitude the subordinate will be allowed to act upon (Graen & Cashman, 1975; Graen & Uhl-Bien, 1995).

On this basis, employees' engagement in innovative behaviour could depend on their relationship with their supervisor in terms of what behaviour they understand they are allowed to engage in and how comfortable or positive they feel regarding how their behaviour will be viewed (Gumusluoglu & Ilsev, 2009; Oldham & Cummings, 1996; Redmond et al., 1993). This is in line with the argument by Graen and Uhl-Bien (1995) that explains that when one pays great attention to a construct such as leadership, organisational creativity is likely to be positively affected.

Previous research has also linked quality of leader-member exchange and individual innovative behaviour, supporting its potential importance in predicting self-reported individual innovative behaviour (c.f. Basu & Green, 1997; Hammond et al., 2011; Kheng & Mahmood, 2013; Sanders et al., 2010; Schermuly et al., 2013; Scott & Bruce, 1994). Kheng and Mahood (2013), Sanders et al. (2010), and Scott and Bruce (1994) found that leader-member exchange was positively related to innovative behaviour and Basu and Green (1997) found that followers who

were strongly supported by their leaders and who were committed to the organisation were more likely to display innovative tendencies. Schermuly et al. (2013) also found that empowerment mediated the relationship between innovation and leader-member exchange.

Innovation and thinking styles

In terms of the various theories and models of individual innovative behaviour, such behaviour results from the interaction of various systems (Amabile, 1996; Scott & Bruce, 1994; Sternberg, 2006). Organisational climate for innovation and leadership are two such external systems however individual factors within the employee him/herself are also crucial elements that contribute to the underlying processes that result in individual innovative behaviour (Amabile, 1996; James, James, & Ashe, 1990; Scott & Bruce, 1994; Sternberg, 2006; Taggar, 2002). Internal characteristics of individuals, such as their personalities, values, and cognitive traits, are examples of important individual factors that may influence self-reported individual innovation **(**Egan, 2005; Shalley, 1991; Taggar, 2002; Tierney et al., 1999).

Kirton (1976) proposed that various individuals will approach and react to a given task or problem in very different ways. As such, behaviour within a particular situation is affected by the fact that individuals operate using different cognitive styles (Scott & Bruce, 1994). In line with this, Sadler-Smith and Badger (1998) suggest that a fundamental determinate of individual innovative behaviour is cognitive style. Different cognitive styles can be seen as higher-order personality traits and are useful in explaining trends in the way in which people approach and solve cognitive problems (Riding & Wigley, 2007).

The construct of thinking styles is defined as an individual's preference for a certain way of processing cognitive information. It also refers to the process used by the individual to solve a particular problem or react to a particular task or set of instructions (Fjell & Walhovd, 2004). Individuals differ in the way in which they use their abilities and often transfer their individual style and strategy across various situations. In this way their thinking style influences their choice of behaviour in different environments (Bernardo et al., 2002; Zhang, 2004**)**. One's thinking style is flexible and may change depending on the situation; they also differ with age and can change as one becomes older (Bernardo et al., 2002; Murphy, 2006). Thinking styles are merely ways of thinking and thus cannot be deemed right or wrong; instead a particular style may be considered more or less effective depending on the given situation in which the

style is being applied (Sternberg, 1999; Cillers & Sternberg, 2001; Sternberg & Grigorenko, 1995a). It is further noteworthy that one's thinking style may be altered in order to suit a particular situation and that adapting a certain style of thinking to suit a given situation is something that can be learnt (Sternberg, 1994a, 1997a).

Scott and Bruce's (1994) study looked at problem-solving styles, which are an aspect of thinking styles (Sternberg, 1990), and hypothesised that the two styles considered, namely intuitive and systematic problem-solving styles, would be related in different ways to individual innovative behavioural tendencies. Their findings showed that only the systematic problem-solving style was significantly (negatively) related to individual innovative behaviour and thus there was no relationship found between intuitive problem-solving style and individual innovative behaviour. Clegg et al. (2002) also considered intuitive and systematic thinking styles' relationships to innovation in terms of generating and implementing ideas. Another study that looked indirectly at the thinking style-innovation relationship was conducted by Riding and Wigley (1997). They found that one's problem solving style moderated the relationship between one's personality and their behaviour. They did not, however, consider individual innovative behaviour specifically. A more recent study that considered this overall relationship demonstrated how different cognitive styles could either benefit or stifle certain stages or phases of the innovation process (Miron-Spektor et al., 2011). Moreover, Wu et al., (2014) found that cognitive functioning was positively related to peer-rated innovative behaviour and Ettlie et al., (2014) found a significant relationship between balanced thinking styles and innovative intention and behaviour.

Despite the above studies, there does not seem to be an extensive or adequate amount of research that has considered possible links between thinking styles and individual innovative behaviour; and as such it is argued that this relationship warrants more in-depth research (Anderson et al., 2014). Investigating the nuances of this broad relationship is argued to be very important because if particular thinking styles can be established as having strong associations with individual innovative behaviour, especially when considered in conjunction with environmental factors, organisations will be able to either seek employees with favourable innovative tendencies or alternatively train employees to adopt a particular style of thinking in order to encourage them to engage in innovative behaviour.

There are a number of possible thinking style models however one of the most comprehensive is the one proposed by Sternberg and Wagner (1991) and Sternberg (1998). This theory is based

on the theory of mental self-government and explains that there are many ways to govern and manage one's activities; these different ways are seen as different thinking styles (Bernardo et al., 2002; Zhang, 2004). The theory of mental self-government explains how individuals use their thought patterns to adjust to their environment (Zhang, 2004). As such, an individual's thinking style is comparable to a personality trait that guides the way in which they use their abilities; and the manner in which one thinks will affect and contribute to determining the way in which one behaves and reacts to information presented (Sternberg, 1994a). Thus, a particular thinking style can benefit one individual in one context but may fail the same individual in another context (Zhang, 2004). The theory of mental self-government proposes thirteen thinking styles that can be understood along five dimensions: functions of thinking styles (legislative, executive, and judicial); forms of thinking styles (monarchic, hierarchical, oligarchic, and anarchic); levels of thinking styles (local and global); scopes of thinking styles (internal and external); as well as leanings of thinking styles (liberal and conservative) (Sternberg, 1999; Sternberg & Wagner, 1991). These styles are summarised below and are presented in a table in Figure 2 in Appendix M.

The thinking style function known as the **legislative** style encompasses those individuals who prefer developing new and fresh ideas and prefer to do tasks in their own way, without others imposing rules in terms of how to carry out the task upon them (Sternberg, 1999; Sternberg & Wagner, 1991). An individual who functions in line with this style of thinking would typically prefer problems that are not pre-structured so that they can structure their personal approach to the problem; as well as creative and constructive planning-based activities (such as writing papers, designing projects, and creating new business systems) (Sternberg, 1999; Sternberg & Wagner, 1991). These individuals often struggle to fit in within organisations as they prefer to do things in their own way. An individual who operates in an **executive** style of thinking is one who prefers to implement a task by being guided by rules, procedures, and a given structure (Sternberg, 1999; Sternberg & Wagner, 1991). This individual typically likes to rely on existing methods to complete tasks or master a situation and will thus apply established rules and laws. Many organisations value individuals who operate in such a way because the individual will fall in line with their set of guidelines (Sternberg, 1999; Sternberg & Wagner, 1991). Lastly, the **judicial** style of thinking refers to individuals who enjoy evaluating, judging, and analysing established rules, procedures, ways, and ideas in terms of both their structure and content (Sternberg, 1999; Sternberg & Wagner, 1991). These individuals would typically choose to deliver critiques, give opinions, judge people's work, and evaluate programmes.

The first of the four forms of thinking styles is known as the **monarchic** style. Individuals who operate from a monarchic thinking style prefer to focus on one task or aspect of a task at a time. They like to focus all attention on one goal until that goal has been attained, after which the next goal will be considered (Sternberg, 1999; Sternberg & Wagner, 1991). Monarchic people also perform better when the task at hand is in some way related to their interests (Sternberg, 1999; Sternberg & Wagner, 1991). The **hierarchical** style of thinking refers to individuals who tend to be motivated by a hierarchy of goals. Thus the individual realises that not all his goals can be achieved equally well which results in the individual prioritising some goals as more important than others, consequentially allocating his resources accordingly and with great care (Sternberg, 1999; Sternberg & Wagner, 1991). These individuals tend to be systematic and organised in the way in which they solve problems and make decisions (Sternberg, 1999; Sternberg & Wagner, 1991). The **oligarchic** style of thinking refers to people who are likely to be motivated by numerous competitive goals of equal perceived importance. These individuals thus find it difficult to decide which goals to prioritise, which creates a difficulty in resource allocation (Sternberg, 1999; Sternberg & Wagner, 1991). Oligarchic people are generally very flexible and can adapt quickly when circumstances change however they often require assistance and guidance in order to successfully complete their tasks (Sternberg, 1999; Sternberg & Wagner, 1991). Finally the **anarchic** style of thinking encompasses those individuals who are typically motivated by a large range of tasks and do not like to be tied down to systems or rules; they are anti-systematic. These people often challenge the system because they enjoy challenging authority figures (Sternberg, 1999; Sternberg & Wagner, 1991). As a result of not having a system or rules to follow, these people have trouble setting priorities and thus use a random approach to solving problems and as such, anarchic people may have a rare and unique potential for creativity because they are not constrained by boundaries of thought and action that people generally surrender to (Sternberg, 1999; Sternberg & Wagner, 1991).

The two levels of thinking styles are differentiated in terms of the **global** style and the **local** style. The global style refers to those individuals who conceptualise and work in a world of ideas thus generally tackling more abstract problems in terms of the big picture (Sternberg, 1999; Sternberg & Wagner, 1991). This is in contrast to the local style of thinking, which is usually apparent in those individuals who prefer working on tasks that require specific, precision, concrete, and fine details (Sternberg, 1999; Sternberg & Wagner, 1991). Sternberg (1996) proposes that creative individuals apply both of these levels.

The scope of thinking styles is either **internal** or **external**. Individuals who have an internal thinking style favour tasks that allow them to work independently and do not require group work. As a result of their preferences to not work with others, these individuals tend to be introverted, task-orientated, socially less sensitive, sometimes aloof, and often lack interpersonal awareness (Sternberg, 1999; Sternberg & Wagner, 1991). This is contrasted with the external style of thinking where the individual prefers to work on tasks that allow them to work with other people through interactions. As such, these individuals are generally extroverted, people-orientated, socially more sensitive, outgoing, and interpersonally more aware (Sternberg, 1999; Sternberg & Wagner, 1991).

The last dimension of thinking styles looks at leanings of thinking styles. The **liberal** style is differentiated from the **conservative** style. The liberal style characterises people who look for or are comfortable with ambiguous situations in that they prefer a degree of unfamiliarity. These individuals seek change by going beyond existing rules and procedures. As a result, liberal people are open to new methods of thinking and adapt easily to new situations (Sternberg, 1999; Sternberg & Wagner, 1991). This is contrasted with the conservative style of thinking in that these individuals prefer to adhere to existing rules and procedures because they prefer familiarity and resist new ways of doing things. Thus these individuals try to minimise change and ambiguity. As a result, when a conservative individual develops their own idea, it tends to be grounded in existing and accepted customs and traditions (Sternberg, 1999; Sternberg & Wagner, 1991).

Considering these thirteen different styles of thinking, it is proposed that certain of the thinking styles may be related to and thus encourage or inhibit self-reported individual innovative behaviour. For example, an individual who uses the legislative style of thought and thus prefers working on tasks that require creative strategies may be more inclined to engage in individual innovative behaviour within the organisation (Sternberg, 1996). Similarly, the judicial thinking style is argued to encourage innovative behaviour as creativity can be inspired by evaluating the products of other's activities. In contrast, an individual operating using the executive style, who prefers to be given guidelines and structure in order to implement an assigned task, may be more inclined to have low individual innovative behavioural tendencies (Sternberg, 1999; Sternberg & Wagner, 1991). In terms of the forms of thinking styles, it is hypothesised that monarchic and hierarchical thinking styles may be less associated with innovative behaviour in comparison to oligarchic and anarchic thinking styles. This is because an individual with an oligarchic thinking style enjoys being stimulated by various tasks simultaneously; thus the

oligarchic individual may be more inclined to behave in an innovative manner since the individual is being stimulated by various forces (Sternberg, 1999; Sternberg & Wagner, 1991). Similarly, a person who has an anarchic thinking style and thus prefers tasks with no system or pre-existing rules may be highly creative in their approach to the task (Sternberg, 1999; Sternberg & Wagner, 1991). In contrast, it seems as though the monarchic and hierarchical styles of thought are less likely to be related to innovative behaviour. This is because focusing on one aspect of a task at a time or having an order of priorities may or may not link to innovative tendencies, depending on the individual's preference and other circumstances.

Moreover, individuals operating with an external style of thinking may also be more likely to display innovative behavioural tendencies. This is because these individuals prefer tasks where interpersonal relationships can be developed and group work is fundamental to the task's success. In this way, the individual is likely to be more innovative because s/he is being influenced by and exposed to many people's thought processes and ideas, which provides for the potential for novel approaches to be considered and implemented (Sternberg, 1999; Sternberg & Wagner, 1991). In contrast, it is unclear as to how a preference for working independently (operating with an internal thinking style) might relate to innovative behaviour as this could facilitate or inhibit innovation.

Another example that elicits the potential relationship between individual innovative behaviour and individual thinking styles is seen in the two types of leaning. The liberal style, where the individual prefers novelty and ambiguity, is likely to be positively related to innovative behaviour. This is because such an individual would be required to be creative in order to achieve success within their ambiguous situation. This is contrasted with the conservative style, where rules and procedures are adhered to, which by definition inhibits creative and innovative behaviour (Sternberg, 1999; Sternberg & Wagner, 1991). Lastly it is hypothesised that both the global and the local thinking style will encourage innovative behaviour because through the individual paying attention to both precise details and the overall picture, creativity might be inspired (Sternberg, 1996).

The above hypothesised relationships between thinking styles and innovative behaviour are likely to exist however are not yet known or established. Thus this study aims to unpack and investigate these various potential relationships.

The current study

Although each of the three factors mentioned above, namely organisational climate for innovation, leader-member exchange, and individual thinking styles, have been established to play a role in individual innovative behaviour individually, there appears to be limited research that has considered them together, particularly in South Africa. This is important because these three factors represent different types of influential factors of innovation; individual thinking styles is internal to the individual, and leader-member exchange and organisational climate are external to the individual. Thus, in order to gain further insight into the construct of individual innovative behaviour within the organisation, it is useful to consider whether these factors are related to and/or how they might work together to predict individual innovation, especially in the South African context. Whilst previous research has explored factors contributing to individual innovative behaviour as perceived by others (Scott and Bruce, 1994), relatively less is known regarding self-reported individual innovative behaviour, and thus this will be explored in terms of the degree to which these innovative behaviours are reported as being enacted in the sample of South African employees; as well as in terms of relationships with employees' thinking styles, their organisational climate for innovative behaviour, and the quality of their relationship with their supervisor (quality of leader-member exchange).

Research questions

1. How are individual innovative behaviour, individual thinking styles, organisational climate for innovation, and leader-member exchange conceptualised in the literature? (addressed in Chapter 1)
2. Which individual innovative practices are reported as being enacted most frequently in the sample?
3. What is the nature of the relationships between self-reported individual innovative behaviour, leader-member exchange, organisational climate for innovation (support for innovation), organisational climate for innovation (resource supply), and individual thinking styles (liberal, conservative, legislative, executive, judicial, monarchic, hierarchic, oligarchic, anarchic, local, global, internal, and external)?
4. To what extent (if at all) is self-reported individual innovative behaviour predicted by leader-member exchange, organisational climate for innovation (support for innovation), organisational climate for innovation (resource supply), and individual

thinking styles; and what are the relative contributions of each of these factors towards predicting self-reported individual innovative behaviour?

5. What recommendations can be made for future research and/or practice? (addressed in Chapter 4)

Hypotheses

1. Self-reported individual innovative behaviour will be positively related to organisational climate for innovation (both support for innovation and resource supply).
2. Self-reported individual innovative behaviour will be positively related to a better quality of leader-member exchange.
3. Self-reported individual innovative behaviour will be positively related to the legislative, judicial, oligarchic, anarchic, external, liberal, global, and local individual thinking styles.
4. Self-reported individual innovative behaviour will be negatively related to the executive and conservative individual thinking styles.
5. Self-reported individual innovative behaviour may or may not be related to the monarchic, hierarchical, and internal individual thinking styles.

CHAPTER TWO: METHODOLOGY

This chapter will first look at the research design employed in this study. It will then discuss the sample and sampling strategy used. After each of the instruments used in the study has been explained and their psychometric properties specified, the procedure followed in this study will be provided. The ethical considerations will then be explored and lastly an overview of the data analysis used to obtain the results (discussed in the next chapter) will be described.

Research Design

This research is classified as a non-experimental, quantitative, cross-sectional, and correlational study. It was non-experimental as the study had no manipulation, no control group, and no random assignment (Cozby, 2009). It was also defined as cross-sectional as the study did not take place over a long period of time and the data was collected at a specific point in time (Cozby, 2009). Lastly, as the study attempted to explore and describe the relationships between the variables of self-reported individual innovative behaviour, individual thinking styles, organisational climate for innovation, and leader-member exchange, the study was classified as a correlational study (Stangor, 2011).

Even though this type of research design is limited in that it cannot be used to establish causality between the variables and is unable to inform the researcher as to why the considered variables are related or not; it does allow one to test the expected relationships between variables as well as to make predictions (Stangor, 2011). It also permits the assessment of a particular type of behaviour in the specific behaviour's natural setting; and is an easy research design to implement (Stangor, 2011).

Sample and Sampling Strategy

The sample was collected through non-probability, volunteer, convenience sampling (Stangor, 2011). The strategy was non-probability because only a limited number of individuals within the target population had an opportunity to volunteer to participate in the study (Cozby, 2009). This sampling strategy is convenient as well as economical; however one of its disadvantages

includes the fact that there is no way to estimate the probability of each element being included in the sample and thus, there is no way to ensure that each potential element of the sample has a chance of actually being included in the study (Rosnow & Rosenthal, 2005). The specific type of non-probability sampling employed was convenience sampling. This is because the researcher handpicked participants who had the desired characteristics, specifically employees working in a South African organisation whose line of work fell within management, product development and/or design, consulting, strategising, advertising, or marketing (in any field), to partake in the study (Rosnow & Rosenthal, 2005). The sample chosen was also reliant upon the employees volunteering their participation hence the sample was convenient and based on willingness to respond (Rosnow & Rosenthal, 2005).

This sample was appropriate for the study because the study aimed to investigate self-reported individual innovative behaviour of employees working within an organisation in the South African context. Apart from participants being employees of a South African organisation working within management, product development and/or design, consulting, strategising, advertising, or marketing (in any field), there were no other requirements for participation and thus no other exclusion criteria in terms of race, gender, tenure, position, and so forth.

Between 15 and 20 organisations in South Africa were approached in order to gain access to the employees within their organisation. Unfortunately the researcher was unable to gain official access into any organisations and thus a snowball sampling strategy was implemented in order to gather as many respondents as possible. Whilst simultaneously snowball sampling, the research approached a part-time studies organisation, Wits Plus, as students who attend this organisation are generally known to also be working within an organisation. Permission to address these individuals was granted.

Although the snowball sampling strategy and access into Wits Plus did assist the researcher in gaining a larger sample, it was still very difficult to get participants to participate. This was possibly due to the length of the questionnaire; especially as many respondents failed to complete the entire questionnaire and/or left out sections of the questionnaire. Ultimately 265 respondents were obtained and found to have completed a sufficient proportion of the questionnaire to be included in the analysis. However due to inconsistent missing sections within the questionnaire, not all of the 265 respondents' responses could be used in all the analyses. As a result, the number of participants within the various analyses differed. Of the responses completed, 265 could be utilised to assess individual innovative behaviour and LMX;

256 to assess organisational climate; 243 to assess the first five thinking styles (liberal, conservative, legislative, executive, and judicial); 227 the next four thinking styles (monarchic, hierarchic, oligarchic, and anarchic); and 219 the final four thinking styles (local, global, internal, and external).

Demographic statistics indicated that of the final 265 participants, there were slightly more females (134 (50.6%)) than males (130 (49.1%)) and 1 participant (0.4%) did not indicate their gender. The average age of the participants was thirty four years old with a standard deviation of approximately nine. The youngest participant was twenty-two years old and the oldest participant was sixty-two years old. In terms of race, 149 (56.2%) of the participants were white; 72 (27.2%) of the participants were black; 24 (9.1%) were coloured; 16 (6%) of participants were Indian; and 4 (1.5%) participants did not indicate their race. The education level of participants varied; 50 (18.9%) participants had a matric; 82 (30.9%) participants had a diploma; 45 (17%) participants had graduated with a Bachelors degree; 45 (17%) participants had an Honours degree; 33 (12.5%) participants had a Masters degree; and 3 (1.1%) participants had a Doctoral degree. There were however 7 (2.6%) participants who did not provide their education levels (please refer to Tables 1, 2, 3, and 4 in Appendix J for a full breakdown of the demographic characteristics).

Participants were asked to provide the length of time that they had been working at their current organisation. The results indicated that the mean number of years was 5.97 years with a standard deviation of 6.17. The shortest amount of time a participant had been working at their current organisation was 0.04 years and the longest amount of time was for 35 years. Moreover, participants were asked to provide the length of time that they had been working in their current position. The results indicated that the mean number of years was 3.77 years with a standard deviation of 4.15. The shortest amount of time a participant had been working at their current position was 0.04 years and the longest amount of time was for 30 years. Furthermore, in order to gain an understanding of size of the team in which the participant was working, the participant was asked to provide the number of people who work in their department or team. The average number of people in the participants' team was 35.05 people with a standard deviation of 116.65. This high standard deviation was likely due to outliers as the smallest team reported was 0 and the largest team reported was 2000.

Participants were asked to provide the industry in which they worked as well as their type of job. As a result of there being a very large range of industries and jobs that were reported, the

researcher grouped the responses into categories. From Table 5 in Appendix J, it appeared that the majority of the sample (87 (32.8%)) were working within the banking, finance and commerce industries; followed by 27 (10.2%) working in consultancy, recruitment, training, and psychological services; 23 (8.7%) working in marketing, sales, and distribution; and 19 (7.2%) working in advertising, journalism, and media related industries. In terms of job, from Table 6 in Appendix J, it appeared that the majority of the sample (125 (47.2%)) worked as managers or in a position of authority (for example, CEO, supervisor, owner, director and so forth…); followed by those (31 (11.7%)) working as consultants or development specialists (for example, product specialists, recruitment, business development, and so forth…); and those (19 (7.2%)) working in administration. The full breakdown of categories for the industries and jobs reported in the sample can be seen in Tables 5 and 6 in Appendix J.

As is explained under the instruments section below, four additional self-developed items were added to the measure of individual innovation that were intended to ascertain the extent to which participants felt that their type of work allowed for and encouraged individual innovative behaviour and the extent to which they felt that innovative behaviour was important and desirable within their field of work. The frequencies of these responses are set out in Table 7 below.

Table 7

Frequencies of responses for the four self-developed items

	Never	**Almost Never**	**Some times**	**Fairly Often**	**Very Often**	**Always**	**Total**	**Missing**
Allow for engagement	3 (1.1%)	18 (6.8%)	51 (19.2%)	65 (24.5%)	78 (29.4%)	47 (17.7%)	262 (98.9%)	3 (1.1%)
Encourage engagement	3 (1.1%)	21 (7.9%)	46 (17.4%)	70 (26.4%)	71 (26.8%)	51 (19.2%)	262 (98.9%)	3 (1.1%)
Important in field of work	3	9	33	43	92	85	265	0

	(1.1%)	(3.4%)	(12.5%)	(16.2%)	(34.7%)	(32.1%)	(100%)	(0%)
Desirable in field of work	2	9	33	49	78	91	262	3
	(0.8%)	(3.4%)	(12.5%)	(18.5%)	(29.4%)	(34.3%)	(98.9%)	(1.1%)

From Table 7, it is evident that 71.6% of the sample (190 participants) indicated that the type of work that they did allowed them to engage in innovative behaviour either fairly often, very often, or always. Moreover, 72.4% of the sample (192 participants) said that the type of work that they did encouraged them to engage in innovative behaviour either fairly often, very often, or always. This indicates that the type of work that the sample was involved in provided for and supported innovative behaviour. Table 7 also indicates that 83% of the sample (220 participants) reported that innovative behaviour was important in their field of work either fairly often, very often, or always. Furthermore, 82.2% of the sample (218 participants) reported that innovative behaviour was desirable in their field of work either fairly often, very often, or always. This indicates that innovative behaviour was considered both vital and sought-after in the fields of work the sample was involved in.

Instruments / Measures

This research utilized five instruments, namely a self-developed, self-report demographic questionnaire, the Self Report Measure of Individual Innovative Behaviour (to which four extra self-developed items were added), the Leadership-Member Exchange questionnaire, the Climate for Innovation Measure, and the Thinking Style Inventory.

Self-developed, Self-report Demographic Questionnaire

Firstly participants were required to complete a self-developed, self-report demographic questionnaire (refer to Appendix D). This questionnaire asked participants to provide their gender, age, race, education level, field of work or industry, type of job, tenure, and size of department. This data was used to describe the sample.

The Self Report Measure of Individual Innovative Behaviour

Secondly participants were asked to complete the Self Report Measure of Individual Innovative Behaviour (refer to Appendix E). This 14-item self-report scale, developed by Kleysen and Street (2001), measures individual innovative behaviour. Items are answered on a six-point Likert-type scale ranging from 'never (1)' to 'always (6)', with higher scores indicating higher levels of individual innovative behaviour. During the development of the scale, a factor analysis confirmed that all items of the scale loaded on one factor indicating one subscale for the instrument and the suitability of an overall score (Kleysen & Street, 2001). The scale also showed a high reported inter-correlation between the items of 0.95 as well as good reported construct validity (Kleysen & Street, 2001).

At the end of this scale, four extra self-developed items were added that aimed to establish the extent to which individuals felt that their type of work allowed for and encouraged individual innovative behaviour; and the extent to which they felt that innovative behaviour was important and desirable within their field of work.

The Leadership-Member Exchange Questionnaire

The third instrument was the Leadership-Member Exchange questionnaire (LMX) (refer to Appendix F). This 7-item self-report scale, used in Graen and Uhl-Bien (1995) and Scandura and Graen (1984), measures the quality of leader-member relationships. Items are answered on a five-point Likert-type scale. Although there are various instruments that measure LMX, the 7-item LMX scale has been found to be the 'most appropriate and recommended measure of LMX' (Graen & Uhl-Bien, 1995, p. 236). Graen and Uhl-Bien (1995) argue in favour of a single factor structure as this structure was found to produce good internal validity. They explain that through adding experimental items to the scale to try further explore the dimensions of the construct, the shorter and more concise 7-item LMX scale was strongly correlated to the expanded scales and produced the same effects. In this way the content of the 7-item LMX scale is argued to have good internal and content validity as it measures what it is supposed to measure. Furthermore this established 7-item scale has been reported to have high Cronbach Alphas such as 0.91 (Klein & Kim, 1998), 0.86 (Scandura & Schriesheim, 1994) and 0.9 (Wayne, Shore, & Linden, 1997) across various studies.

The Climate for Innovation Measure

Fourthly, participants were required to complete the Climate for Innovation Measure (refer to Appendix G). This 22-item self-report scale, adapted by Scott and Bruce (1994) from the Siegal

and Kaemmerer (1978) scale, measures organisational climate for innovation and contains two subscales, namely: support for innovation and resource supply. Support for innovation measures the degree to which one views the organisation as being open to change, supportive of novel ideas from employees, and tolerant of employee diversity. Resource supply measures the degree to which resources, including personnel, funding, and time, are seen as sufficient in the organisation. Items are answered on a five-point Likert-type scale ranging from 'strongly disagree (1)' to 'strongly agree (5)' with higher scores indicating a more positive climate for innovation and reverse scoring applied as relevant (Scott & Bruce, 1994). A factor analysis conducted by Scott and Bruce (1994) confirmed the structure of the two subscales thus indicating good internal validity for the scale. Cronbach Alphas for the two subscales were reported as 0.92 for the support for innovation subscale and 0.77 for the resource supply subscale (Scott & Bruce, 1994).

The Thinking Style Inventory

Lastly, participants were asked to complete the Thinking Style Inventory (TSI) (refer to Appendix H). This 104-item scale, developed by Sternberg and Wagner (1992), measures individual thinking styles. The TSI contains 13 subscales (one for each style of thinking), each with eight items. These 13 subscales can be grouped into 5 clusters (please refer to Figure 2 in Appendix M for the full list of clusters and subscales). Items are answered on a seven-point Likert-type scale ranging from 'not at all well (1)' to 'extremely well (7)'. This scale has been shown to be reliable and valid across many cultural groups including in the United States (Grigorenko & Sternberg, 1997; Sternberg, 1999; Sternberg & Grigorenko, 1995a, 1995b); in Hong Kong and China (Zhang & Sachs, 1997; Zhang & Sternberg, 1998; 2000); in various European countries (Balkis & Isiker, 2005; Fjell & Walhovd, 2004), and in South Africa (Cilliers & Sternberg, 2001). Furthermore, the scale has been found to be reliable for both student and adult populations (Zhang, 2005b). Cronbach Alpha coefficients across the subscales have been found to range from 0.44 to 0.88 (Sternberg, 1994b); from 0.53 to 0.87 (Zhang & Sachs, 1997); and from 0.46 to 0.89 (Zhang, 1999). The scale has further been found to have good construct validity (Fjell & Walhovd, 2004; Sternberg, 1994b; Zhang, 1999) and good convergent validity (Zhang & Sternberg, 2000). Although all one hundred and four items were used in this study, in order to maximise the potential sample size and ensure adequate responses were received, the order of items was adjusted slightly. This scale has a fairly well validated factor structure indicating good internal validity for the scale and has been applied in

the South African context (Murphy, 2006; Sternberg, 1994b; Zhang & Sternberg, 1998; 2000; Zhang, 1999).

Procedure

In order to gather the data for this study, consent from the Human Research Ethics Committee (non-medical) was requested. Once the ethical clearance number was obtained (MORG/14/014 IH (see Appendix I), the Human Resources departments of South African organisations were approached. The researcher explained all the appropriate information pertaining to the details of this study. This information was also provided in an access request letter (see Appendix A). The access letter also asked whether the organisation would prefer the questionnaire to be administered via electronic distribution or via hardcopy (with the latter made available only if requested by the organisation or if necessary to increase the sample size). Unfortunately, permission from all the organisations approached was denied and as such the researcher began to collect a snowball sample by sending out an email invitation to participate on social networks. The cover email sent out briefly explained the nature of the study as well as clearly specified the exclusion criteria for participation. It also explained that participation was completely voluntary with no foreseeable risks or benefits, as well as requested that the people who received the email please forward it to anyone they knew who might fit the criteria and might be willing to take part.

The email also contained a link to the online questionnaire on Survey Monkey. The link initially directed the participant to a participant information sheet (see Appendix B). This outlined who the researcher was, the purpose of the study, an invitation to participate in the study (if the individual fitted the participation criteria), what participation would entail, that participation was completely voluntary and that there would be no negative outcomes for choosing not to participate in the study, the lack of risks and benefits of the study, the deadline for completion of the questionnaire, as well as how feedback would be able to be obtained (posted on a blog). The researcher's and supervisor's contact details were also provided if the participants had any questions or would have liked more information, and it was made clear that completing and submitting the online questionnaire would be taken as informed consent to participate in the study. Those approached who chose to participate were then able to continue with the online questionnaire, which contained the demographic questionnaire (see Appendix D), the Self Report Measure of Individual Innovative Behaviour (see Appendix E),

the Leader Member Exchange measure (see Appendix F), the Climate for Innovation Measure (see Appendix G), and the Thinking Style Inventory (see Appendix H). Completing and submitting the questionnaire pack was estimated to take approximately 25 to 30 minutes.

Participants were asked to complete the questionnaire pack within a period of two weeks from the date on which they received the invitation to participate. However in order to maximise the response rate, this period of time was extended resulting in the final sample size being collected over a five month period.

In order to maximise the response rate, hardcopy distribution was also offered to those participants who preferred completing the questionnaire by pen-and-paper. A part time studies organisation, Wits Plus, was approached. Students who attended Wits Plus were typically adults who were working full-time at an organisation and studying part-time. The researcher explained the study to the first year coordinator and requested permission to address the first year psychology students for five minutes at the beginning of one of their classes. The course co-ordinator was provided with the access letter as well as a participant information sheet and the attached questionnaire. After gaining permission to address the class, the researcher explained the study to the first year psychology students and handed out hardcopy questionnaire packs to those students who fitted the exclusion criteria and displayed interest in completing the questionnaire. The researcher asked the students to please return the questionnaire to their coordinator within a two week period.

After all the data had been collated, the data was analysed according to the appropriate statistical techniques.

Ethical considerations

Permission to conduct the study was obtained from the University of the Witwatersrand Human Research Ethics Committee (non-medical) (MORG/14/014 IH).

Regarding informed consent, employees whose line of work fell within the field of management, product development and/or design, consulting, strategising, advertising, or marketing (in any field) were provided with a detailed participant information sheet (see Appendix B for the electronic version or Appendix C for the hardcopy version) explaining that participation involved completing the questionnaire and that an individual's choice to

participate or not was completely voluntary, with no negative consequences if they chose not to participate. Completing and returning the questionnaire pack was taken as informed consent to participate in the study. The consent form also explained that the participants were permitted to withdraw from the study at any time until the point of submitting the questionnaire (Creswell, 2009).

In order to preserve anonymity and confidentiality, the questionnaire did not request any individual identifying information and responses were completely anonymous. No IP addresses were recorded. Only overall feedback for the study was provided and no individual feedback was available; this was made clear in the participant information sheet and access request letter.

There were no direct benefits for participation and there were no foreseeable risks that could be identified (Cresswell, 2009).

Lastly, the ethical consideration of debriefing was considered (Creswell, 2009). The participants were informed that it was not possible to provide individual feedback as responses were anonymous; however the researcher undertook to compile a one-page summary of the general findings of the research to be posted on a blog, details for which were given to participants in the participant information sheet. The researcher's and supervisor's contact details were also provided on this sheet, in case further information was requested or for queries.

Data analysis

The data collected was exported from Survey Monkey and coded. This data was combined with hardcopy data that was coded manually to align with the data exported from Survey Monkey. All of this data was then cleaned and imported into IBM SPSS Statistics 22 for analysis.

In order to assess the internal consistency reliability of the psychometric scales used, Cronbach Alpha Coefficients were run (Huck, 2004). Cronbach Alpha Coefficients generate values between 0 and 1, with a higher value indicating a higher degree of internal consistency (Gravetter & Forzano, 2009). These values are used to measure the internal consistency reliability of a psychometric scale for a sample of examinees (Gravetter & Forzano, 2009). Internal consistency reliability defines the uniformity of the results delivered in a test. This

ensures that the various items measuring the different constructs deliver consistent scores (Gravetter & Forzano, 2009).

In order to ascertain the characteristics of the sample, descriptive statistics were run. One-way frequencies were run on the nominal variables in the demographic questionnaire, specifically participants' gender, race, education level, and the industry and type of job in which the participant worked. The sample size, mean, standard deviation, and range were run for the demographic variables that were at least interval in nature, specifically age, the length of time the individual had been working in their organisation (time in organisation), the length of time the individual had been working in their current position (time in position), and the size of the individual's team in which they worked (team size).

Descriptive statistics (sample size, mean, standard deviation, and range) were run for each scale and subscale to establish the levels and distribution of innovation, leader-member exchange, organisational climate for innovation, and thinking styles in the sample.

To determine whether the data was distributed normally, Central Limit Theorem was applied and descriptive statistics and histograms were assessed. Skewness coefficients and kurtosis values were also calculated. The Central Limit Theorem explains that as the sample size of a particular set of data gets larger and larger, the distribution of the data will approach that of a normal distribution (Brase & Brase, 2012). As a result, statisticians have agreed that where a sample consists of 30 or more, the distribution of the data will be deemed normal and the Central Limit Theorem will apply (Brase & Brase, 2012). A histogram is a graph displaying the frequency distribution of a set of data (Peck & Devore, 2012). Histograms are valuable and useful tools because they provide an organised visual display of the data (Brase & Brase, 2012) which can be used to assess the shape and pattern of the data and ultimately determine whether the data is normally distributed (Peck & Devore, 2012).

A skewness coefficient 'compares the mean and median in light of the magnitude of the standard deviation' (Black, 2012, p. 84). In terms of the formula used to calculate the skewness coefficient, if the distribution is symmetrical, the mean and median will be the same value and thus the skewness coefficient will be equal to zero (Black, 2012). The value of the skewness coefficient usually lies between -1 and +1, indicating a normal distribution, however, when the value of the skewness coefficient lies outside of this range, it is usually indicative of a skewed distribution (Shenoy, Srivastava, & Sharma, 2005). Kurtosis is a measure of the degree of

peakedness of the curve representing the distribution (Antonius, 2003). A kurtosis value of zero represents a normal distribution; a kurtosis value that is positive indicates that the curve is highly peaked and that the data is clustered around the centre; and a kurtosis value that is negative indicates that the curve is flatter than a normal curve and that the data is more widely spread out (Antonius, 2003). There are varying interpretations of the kurtosis value; however a kurtosis value relatively close to zero is generally considered to be acceptable in representing a relatively normal distribution of the data (DeCarli, 1997).

These values were obtained and techniques implemented in order to determine the type of analyses that needed to be utilised to answer the research questions. Using the results of all of these techniques, it was decided that the data was sufficiently normal to support running parametric analyses to answer the research questions.

The first research question was addressed by calculating the combined frequency of those participants who answered 'Very often' and 'Always' for each of the fourteen items that made up the Self-Reported Measure of Individual Innovative Behaviour. This allowed the researcher to gain insight into which of the individual innovative practices were reported as being applied most frequently within the sample.

The second research question focussed on assessing the relationships between self-reported innovative behaviour and the other variables. As such parametric correlations (Pearson's Correlation Coefficients) were run (Huck, 2004). The Pearson's test uses a monotonic function to assess the nature of the relationship between two variables (Jackson, 2012). The Pearson's correlation coefficient (r_s) is a value that ranges from -1 to +1 (Jackson, 2012). A value of 1 indicates that the relationship is perfect and a value of zero indicates that there is no relationship between the two variables (Jackson, 2012). The closer *r* is to zero, the weaker the association between the two variables; and conversely the closer *r* is to one, the stronger the association between the two variables (Jackson, 2012). A negative value indicates a negative relationship, (in other words when the value of one variable changes, the value of the other variable will also change and move in the opposite direction) and a positive value indicates that the relationship between the two variables is positive (in other words when the value of one variable changes, the value of the other variable will also change and move in the same direction) (Jackson, 2012).

In order to answer the third research question, multiple regressions were run. However, before running these regressions, it was essential to consider the potential issue of multicollinearity between the predictor variables (i.e. those functioning as independent variables in the regression). Multicollinearity can exist in a predictive model when two or more independent variables are highly related (Matignon, 2005). This causes one to be unable to analyse the importance of the variables put into the model because the variables are likely to provide identical information in explaining or predicting the underlying effect of the dependent variable (Matignon, 2005). Multicollinearity is due to the independent variables selected to put into the model (Matignon, 2005). As such, it was necessary to check the nature of the relationships between all of those variables functioning as proposed predictors in the regression, namely organisational support, organisational resources, LMX, and the thirteen individual thinking styles.

Consequentially the researcher decided to take precautions and cluster the thirteen thinking styles into five dimensions as set out in Figure 2 in Appendix M (leanings, forms, functions, levels, and scopes). Five separate multiple regressions were run for the five dimensions. It must however be noted that leader-member exchange, organisational support, and organisational resources were still included as separate predictor variables within each of the five multiple regressions. Moreover, the potential problem of multicollinearity was further considered through the researcher consistently monitoring the condition indexes, the variance inflation factor (VIF) value, as well as the tolerance values. When these values are holistically considered, potentially problematic levels of multicollinearity can be detected (Smart & Tierney, 2002). When interpreting these values, a general rule of thumb can be applied. Firstly a condition index value that is greater than 30 would indicate that multicollinearity could be an issue. Moreover, tolerances that are less than or equal to 0.1 could indicate high multicollinearity and finally, VIF values greater than 5 could also indicate issues of multicollinearity (Smart & Tierney, 2002).

As such, in order to determine the extent to which individual innovative behaviour was predicted by the predictor variables (namely organisational climate (split into organisational support and organisational resources), leader-member exchange (LMX), and the thirteen thinking styles (liberal, conservative, legislative, executive, judicial, monarchic, hierarchic, oligarchic, anarchic, local, global, internal, and external) clustered according to five larger

groupings (leanings, forms, functions, levels, and scopes)), five multiple regressions were run and interpreted.

CHAPTER THREE: RESULTS

This chapter reports an analysis of the statistical results obtained from the data in this study. The statistics were produced by IBM SPSS Statistics 22.

Reliabilities

In order to assess the internal consistency reliability of the scales used in the study to measure self-reported individual innovative behaviour (hereafter referred to as innovative behaviour); leader-member exchange (hereafter referred to as LMX); organisational climate for innovation - support for innovation (hereafter referred to as organisational support); organisational climate for innovation - resource supply (hereafter referred to as organisational resources); and individual thinking styles (hereafter also referred to as the thirteen subscales, namely liberal, conservative, legislative, executive, judicial, monarchic, hierarchical, oligarchic, anarchic, local, global, internal, and external), Cronbach Alpha Coefficients were calculated. Table 8 below provides the Cronbach Alpha Coefficients that were obtained from the data collected for the scales used in this study.

Table 8

Cronbach Alpha coefficients for innovative behaviour, LMX, organisational support, organisational resources, and individual thinking styles

	Item	Cronbach's Alpha
Innovative Behaviour	14	0.94
LMX	7	0.92
Organisational Support	16	0.91
Organisational Resources	6	0.72
Liberal	8	0.88
Conservative	8	0.90

Legislative	8	0.82
Executive	8	0.87
Judicial	8	0.77
Monarchic	8	0.74
Hierarchical	8	0.85
Oligarchic	8	0.87
Anarchic	8	0.67
Local	8	0.75
Global	8	0.77
Internal	8	0.81
External	8	0.85

The results above indicate that the majority of the scales and subscales produced Cronbach Alphas above 0.80, demonstrating high internal consistency reliability in the sample (Murphy & Davidshofer, 2005; Nunnally, 1978). Although certain subscales did produce Cronbach Alphas that were slightly lower, specifically organisational resources ($\alpha = 0.72$), judicial ($\alpha = 0.77$), monarchic ($\alpha = 0.74$), local ($\alpha = 0.75$), and global ($\alpha = 0.77$), these Cronbach Alphas still indicated moderate internal consistency as they were above 0.7 (Murphy & Davidshofer, 2005; Nunnally, 1978). One of the thinking style subscales, anarchic, did yield a Cronbach Alpha below 0.7 ($\alpha = 0.67$). Although this was slightly lower than the rest of the Cronbach Alphas in that it represented a low to moderate reliability, previous estimates for this subscale, specifically in Murphy (2006), produced a lower Cronbach Alpha (0.59) and moreover removing items within this subscale did not improve the Alpha. As this subscale was deemed useful to include in the study for theoretical purposes, it was considered acceptable to use. As such, the scales and subscales were found to have largely shown good internal consistency reliability within the sample and were deemed appropriate to use.

Descriptive Statistics

In order to ascertain the sample's levels of innovative behaviour, LMX, organisational resources, organisational support, and the thirteen individual thinking styles, descriptive statistics were calculated (mean, standard deviation, and range). These values, together with skewness coefficients and kurtosis values, and histograms reflecting the data's shape (please refer to Appendix L), were used to assess normality.

Table 9

Descriptive statistics and normality for innovative behaviour, LMX, organisational support, organisational resources, and individual thinking styles

Variable	N	Mean	Standard Deviation	Min.	Max.	Skewness	Kurtosis
Innov. Behaviour	265	61.41	11.861	19	84	-0.414	0.232
LMX	265	25.26	6.266	0	35	-0.665	0.446
Org. Support	256	53.89	11.764	18	78	-0.297	-0.284
Org. Resources	256	18.59	4.283	6	30	0.036	-0.083
Liberal	243	40.63	8.093	16	56	-0.646	0.521
Conservative	243	30.22	9.391	9	56	0.234	-0.221
Legislative	243	40.49	7.487	18	55	-0.600	0.009
Executive	243	35.65	8.812	12	56	-0.187	-0.304
Judicial	243	36.51	7.784	15	53	-0.249	-0.149
Monarchic	227	32.17	7.531	15	52	0.339	-0.270
Hierarchical	227	40.52	7.747	18	56	-0.281	-0.299
Oligarchic	227	32.87	9.062	8	56	-0.040	-0.313
Anarchic	227	36.63	6.775	18	52	-0.005	-0.238

Local	219	34.03	7.484	12	54	-0.015	-0.219
Global	219	33.46	7.292	16	54	0.175	-0.289
Internal	219	33.85	8.072	13	53	0.182	-0.579
External	219	39.68	7.761	19	56	-0.208	-0.438

Based on the results in Table 9, together with the histograms in Appendix L, the sample's overall levels of most of the variables appeared to be roughly average with only a few participants reporting extremely low or extremely high scores. The exceptions to this were LMX, the liberal thinking style, and the legislative thinking style which appeared to be slightly high (slight skewing to the left).

Normality

In order to accurately answer the research questions, appropriate statistical techniques needed to be employed. Thus, normality needed to be assessed in order to determine whether parametric or non-parametric statistical techniques were appropriate to utilize (Howell, 2008). Even though the Central Limit Theorem states that a sample larger than thirty implies the assumption of normality, one must be careful to not apply this rule blindly as it has been established that this does not always guarantee normal distribution of the data (Brase & Brase, 2012).

To further assess normality, skewness coefficients and kurtosis values were obtained. As shown in Table 9, all of the scales and subscales produced skewness coefficients that comfortably fell between -1 and +1, indicating that the data was acceptably normal in distribution. Although none of the kurtosis values were zero indicating a perfectly normal distribution, all the kurtosis values were sufficiently close enough to zero to further eliminate any major concerns regarding non-normal distribution of the data (DeCarlo, 1997). In order to confirm this deduction, the histograms (seen in Appendix L) were examined. These suggested relatively normal distributions of the data or very slight negative skewing; and none were sufficiently skewed to cause concern.

After carefully considering these various measures of normality, expressed above, it was concluded that the data was sufficiently normally distributed to support parametric analysis (Howell, 2008).

Innovative practice in the sample

In order to address the first research question regarding which individual innovative practices were reported as being implemented most frequently in the sample, a combined frequency of those answering 'Very often' and 'Always' was calculated for each of the fourteen items listed in the Self-Report Measure of Individual Innovative Behaviour. Table 10 below depicts the response frequencies and percentages for each of these fourteen individual innovative behaviours. Table 10 also ranks the scale items in order of which practices were more frequently reported so that the innovative practices that were more and less common within the sample could be identified. Please see Table 10 in Appendix K for a full breakdown of the frequencies of the self-reported individual innovative behaviour scale.

Table 11

Frequencies for individual innovative behaviours (total N = 265)

Item from scale	n	Perc.	Rank
1. Look for opportunities to improve what exists	173	65.3	2
2. Recognise opportunities to make a positive difference	173	65.2	3
3. Pay attention to non-routine issues	111	41.9	12
4. Generate ideas or solutions to address problems	181	68.3	1
5. Define problems more broadly to gain greater insight	145	54.7	4
6. Experiment with new ideas and solutions	131	49.5	7
7. Test out ideas or solutions to address unmet needs	94	35.5	14
8. Evaluate the strengths and weaknesses of new ideas	112	42.3	11

9. Try to persuade others of the importance of something new	138	52.0	6
10. Push ideas forward for implementation	123	46.4	8
11. Take the risk to support new ideas	122	46.1	9/10
12. Implement changes that seem to be beneficial	140	52.8	5
13. Work the bugs out of new approaches applied to what exists	110	41.5	13
14. Incorporate new ideas for improvement to what exists	122	46.1	9/10

The four most reported individual innovative behaviours identified were that the individual generates ideas or solutions to address problems (68.3%); looks for opportunities to improve an existing process, technology, product, service, or work relationship (65.3%); recognises opportunities to make a positive difference in their work, department, organisation, or with customers (65.2%); and defines problems more broadly in order to gain greater insight into them (54.7%).

It is also interesting to note the four least reported individual innovative behaviours in the sample. These were: evaluating the strengths and weaknesses of new ideas (42.3%); paying attention to non-routine issues in one's work, department, organisation, or the market place (41.9%); working out the bugs of new approaches when applying them to an existing process, technology, product, or service (41.5%); and the lowest reported behaviour, which was testing out ideas or solutions to address unmet needs (35.5%).

<u>The relationships between innovative behaviour and the other variables</u>

As the data was normally distributed, in order to investigate the nature of the relationships between innovative behaviour and the other variables namely LMX, organisational support, organisational resources, and the thirteen individual thinking styles, the parametric Pearson's Correlation Coefficient was utilised.

Tables 12 and 13 below present the correlation matrices for these variables.

Table 12

Relationships between innovative behaviour and LMX, organisational support, and organisational resources

	Pearson's Correlation Coefficients		
	LMX	**Organisational Support**	**Organisational Resources**
Innovative Behaviour	0.231	0.250	0.298
	0.000	0.000	0.000
	n = 265	n = 256	n = 256

Table 12 above illustrates the following results. Innovative behaviour was found to be significantly, weakly, and positively related to LMX (r = 0.231; p = 0.000), organisational support (r = 0.250; p = 0.000) and organisational resources (r = 0.298; p = 0.000). These results suggest that increased innovative behaviour is related to a better quality of LMX, increased organisational support, and increased organisational resources.

Table 13

Relationships between innovative behaviour and individual thinking styles

	Pearson's Correlation Coefficients						
	Liberal	**Conserv.**	**Legisl.**	**Exec.**	**Judic.**	**Monarc.**	**Hierarc.**
Innovative Behaviour	0.520	0.002	0.393	0.104	0.381	0.089	0.327
	0.000	0.975	0.000	0.104	0.000	0.180	0.000
	n = 243	n = 243	n = 243	n = 243	n = 243	n = 227	n = 227
	Oligarc.	**Anarc.**	**Local**	**Global**	**Internal**	**External**	

Innovative Behaviour	0.102	0.247	0.123	0.227	0.158	0.220
	0.124	0.000	0.069	0.001	0.019	0.001
	n = 227	n = 227	n = 219	n = 219	n = 219	n = 219

Table 13 above depicts that innovative behaviour was found to be significantly, weakly, and positively related to the anarchic ($r = 0.247$; $p = 0.000$), global ($r = 0.227$; $p = 0.001$), internal ($r = 0.227$; $p = 0.001$), and external ($r = 0.220$; $p = 0.001$) individual thinking styles. Moreover, innovative behaviour was found to be significantly, moderately, and positively related to the legislative ($r = 0.393$; $p = 0.000$), judicial ($r = 0.381$; $p = 0.000$), and hierarchical ($r = 0.327$; $p = 0.000$) individual thinking styles. Lastly, innovative behaviour was found to be significantly, moderate-strongly, and positively related to the liberal ($r = 0.520$; $p = 0.000$) thinking style. All of these relationships were positive which suggests that when an individual operates more from a legislative, judicial, hierarchical, anarchic, global, internal, and/or external thinking style, they are more likely to engage in individual innovative behaviour. Contrastingly, self-reported innovative behaviour was not significantly related to the conservative, executive, monarchic, oligarchic, and local individual thinking styles. These results shed light onto the relationships between self-reported individual innovative behaviour and individual thinking styles as these relationships do not appear to have been adequately considered in the available literature.

Multicollinearity

Prior to running regressions it was necessary to consider the issue of potential multicollinearity between the predictor variables. The issue of multicollinearity arises in a predictive model when two or more independent variables are highly related and as such one is not entirely able to extract the importance of a particular variable put into the model (Matignon, 2005). As such, multicollinearity needed to be investigated through considering inter-relationships between the various predictor variables.

Tables 14, and 15 in Appendix K show the inter-correlations between the thirteen individual thinking styles; and the inter-relationships between organisational support, organisational resources, LMX, and the thinking styles. From these correlations, it was evident that although

no thinking styles were significantly correlated with LMX, certain of the thinking styles were significantly correlated with organisational support (namely the internal thinking style, which was significantly, weakly, and negatively related) and organisational resources (namely the executive, hierarchical, oligarchic, and external thinking styles, which were all significantly, weakly, and positively correlated). Moreover, all the thinking styles were correlated with each other except for the following pairs: liberal-conservative; liberal-oligarchic; legislative-oligarchic; and external-internal. Additionally, LMX was significantly, moderate-strongly, and positively correlated with organisational support and was significantly, weakly, and positively related to organisational resources; and organisational resources was significantly, strongly, and positively correlated with organisational support (Please refer to Tables 14, and 15 in Appendix K for a full breakdown of inter-relationships between these variables).

This raised concerns as to whether multicollinearity might have been problematic within the proposed predictive models for innovative behaviour. As such, the researcher chose to cluster the thinking styles into five separate sets based on the dimensions as set out in Figure 2 in Appendix M, namely leanings, forms, functions, levels, and scopes. LMX, organisational support, and organisational resources were still included as separate independent variables with each of these sets/ clusters of thinking styles. According to these clusters, five multiple regressions were run in order to establish which variables could be found to predict innovative behaviour. Moreover, in order to handle other potential concerns regarding multicollinearity, the condition indices, variance inflation factor (VIF) values, and tolerance values were consistently monitored.

Factors predicting innovative behaviour

Due to the concerns of multicollinearity explained above, particularly because of the inter-relationships between the individual thinking styles (as seen in the correlation matrix in Table 14 in Appendix K), the thirteen styles of thinking were grouped together in terms of their clusters (leanings, forms, functions, levels, and scopes). Multiple regression analyses were run for each cluster/ set of thinking styles along with the other key predictor variables, namely LMX, organisational resources, and organisational support. Furthermore, in order to account for the potential problem of multicollinearity still occurring, particular attention was given to the condition indices, VIF values, and tolerance values for each calculated multiple regression.

LMX, organisational support and resources, and functions as potential predictors of innovative behaviour

The first regression model (Model 1) considered LMX, organisational support, organisational resources, and the legislative, executive, and judicial thinking styles (which form the 'functions' cluster) as predictors of individual innovative behaviour. The results are presented in Tables 16 and 17 below.

Table 16

Model 1 Summary

Model	R	R^2	Adjusted R^2	Std. Error	Sig.
1	0.548	0.300	0.282	9.949	0.000

Table 17

Coefficients and collinearity diagnostics for Model 1

Model	Unstandardized		Standardized			Collinearity Diag.		
	B	Std. Error	Beta	t	Sig.	Tol.	VIF	Cond. Ind.
(Constant)	17.877	5.093		3.510	0.001			1.000
LMX	0.243	0.120	0.131	2.025	0.044	0.710	1.408	8.590
Org. Support	0.011	0.077	0.011	0.147	0.883	0.494	2.026	13.223
Org. Resources	0.695	0.190	0.254	3.666	0.000	0.619	1.616	14.498
Legislative	0.418	0.113	0.267	3.709	0.000	0.574	1.741	20.298
Executive	-0.215	0.088	-0.162	-2.457	0.015	0.686	1.457	21.675

Judicial	0.403	0.120	0.267	3.352	0.001	0.467	2.141	25.374

Tables 16 and 17 above illustrate the findings for the first multiple regression model. This table indicates that multicollinearity was not a problem for this model since the condition index did not exceed 30; there were no tolerance values that were less than or equal to 0.1; and the VIF values were not greater than 5.

The model was significant (p = 0.000) and 30% (R^2 = 0.300) of the variation in innovative behaviour was explained by the independent variables entered into this model (namely LMX, organisational support, organisational resources, and the legislative, executive, and judicial thinking styles). It was further found that the significant predictors of innovative behaviour were LMX (t = 2.025; p = 0.044); organisational resources (t = 3.666; p = 0.000); legislative thinking style (t = 3.709; p = 0.000); executive thinking style (t = -2.457; p = 0.015); and judicial thinking style (t = 3.352; p = 0.001). Based on the standardized Beta values, it appeared that the legislative and judicial thinking styles had the highest Beta values (β = 0.267 for both) and thus contributed the most to explaining innovative behaviour followed by organisational resources (β = 0.254), executive thinking style (β = -0.162), and then LMX (β = 0.131). It is interesting to note that executive thinking style was the only independent variable to produce a Beta value that was negative, which was indicative of a negative relationship between innovative behaviour and the executive thinking style.

LMX, organisational support and resources, and forms as potential predictors of innovative behaviour

The second regression model (Model 2) considered LMX, organisational support, organisational resources, and the monarchic, hierarchical, oligarchic, and anarchic thinking styles (which form the 'forms' cluster) as predictors of individual innovative behaviour. The results are presented in Tables 18 and 19 below.

Table 18

Model 2 Summary

Model	**R**	**R^2**	**Adjusted R^2**	**Std. Error**	**Sig.**

2	0.454	0.206	0.180	10.479	0.000

Table 19

Coefficients and collinearity diagnostics for Model 2

Model	**Unstandardized**		**Standardized**			**Collinearity Diag.**		
	B	**Std. Error**	**Beta**	**t**	**Sig.**	**Tol.**	**VIF**	**Cond. Ind.**
(Constant)	24.285	5.684		4.272	0.000			1.000
LMX	0.223	0.132	0.121	1.694	0.092	0.711	1.406	8.616
Org. Support	0.046	0.083	0.047	0.558	0.577	0.502	1.994	13.751
Org. Resources	0.527	0.205	0.197	2.573	0.011	0.619	1.616	14.976
Monarchic	0.000	0.113	0.000	-0.002	0.998	0.668	1.497	16.739
Hierarchical	0.404	0.115	0.271	3.525	0.001	0.615	1.625	21.824
Oligarchic	-0.149	0.098	-0.117	-1.526	0.129	0.622	1.608	24.098
Anarchic	0.219	0.136	0.128	1.609	0.109	0.571	1.751	25.179

Tables 18 and 19 above illustrate the findings for the second multiple regression model; as well as that multicollinearity was unproblematic within this model based on the CI, VIF, and tolerance values.

The multiple regression model was found to be significant ($p = 0.000$). Moreover, 20.6% ($R^2 = 0.206$) of the variation in innovative behaviour was explained by the independent variables entered into this model (namely LMX, organisational support, organisational resources, and the monarchic, hierarchical, oligarchic, and anarchic thinking styles). It was also found that the significant predictors of innovative behaviour were organisational resources ($t = 2.573$; $p =$

0.011) and hierarchical thinking style (t = 3.525; p = 0.001). Hierarchical thinking style had a higher standardized Beta value (β = 0.271) than organisational resources (β = 0.197) suggesting that hierarchical thinking style contributed more to explaining innovative behaviour than organisational resources.

LMX, organisational support and resources, and levels as potential predictors of innovative behaviour

The third regression model (Model 3) considered LMX, organisational support, organisational resources, and the local and global thinking styles (which form the 'levels' cluster) as predictors of individual innovative behaviour. The results are presented in Tables 20 and 21 below.

Table 20

Model 3 Summary

Model	R	R^2	Adjusted R^2	Std. Error	Sig.
3	0.410	0.168	0.149	10.888	0.000

Table 21

Coefficients and collinearity diagnostics for Model 3

Model	Unstandardized		Standardized			Collinearity Diag.		
	B	Std. Error	Beta	t	Sig.	Tol.	VIF	Cond. Ind.
(Constant)	26.712	5.918		4.514	0.000			1.000
LMX	0.217	0.141	0.116	1.539	0.125	0.692	1.446	8.658
Org. Support	0.052	0.086	0.053	0.609	0.543	0.515	1.943	11.317

Org. Resources	0.665	0.209	0.245	3.189	0.002	0.659	1.517	14.505
Local	0.101	0.105	0.064	0.961	0.338	0.882	1.133	18.350
Global	0.326	0.109	0.201	3.003	0.003	0.868	1.152	21.846

Tables 20 and 21 above illustrate the findings for the third multiple regression model. In terms of this table multicollinearity within this model was unproblematic.

The overall model for this multiple regression was significant ($p = 0.000$) and the R^2 was 0.168, indicating that the independent variables entered into this model (namely LMX, organisational support, organisational resources, and the local and global thinking styles) explained 16.8% of the variance in individual innovative behaviour. It was also evident that the significant predictors of innovative behaviour were organisational resources ($t = 3.189$; $p = 0.002$) and global thinking style ($t = 3.003$; $p = 0.003$). Organisational resources had a higher standardized Beta value ($\beta = 0.245$) than global thinking style ($\beta = 0.201$), suggesting that organisational resources contributed more to explaining innovative behaviour than global thinking style.

LMX, organisational support and resources, and scope as potential predictors of innovative behaviour

The forth regression model (Model 4) considered LMX, organisational support, organisational resources, and the internal and external thinking styles (which form the 'scope' cluster) as predictors of individual innovative behaviour. The results are presented in Tables 22 and 23 below.

Table 22

Model 4 Summary

Model	R	R^2	Adjusted R^2	Std. Error	Sig.
4	0.437	0.191	0.172	10.736	0.000

Table 23

Coefficients and collinearity diagnostics for Model 4

Model	Unstandardized		Standardized			Collinearity Diag.		
	B	**Std. Error**	**Beta**	**t**	**Sig.**	**Tol.**	**VIF**	**Cond. Ind.**
(Constant)	18.453	6.498		2.840	0.005			1.000
LMX	0.261	0.135	0.139	1.930	0.055	0.731	1.368	8.849
Org. Support	0.052	0.084	0.052	0.612	0.541	0.521	1.919	11.240
Org. Resources	0.616	0.206	0.227	2.983	0.003	0.655	1.528	12.394
Internal	0.309	0.092	0.211	3.364	0.001	0.964	1.037	18.308
External	0.302	0.096	0.199	3.154	0.002	0.955	1.047	24.504

Tables 22 and 23 above illustrate the findings for the fourth multiple regression model as well as that multicollinearity was unproblematic within this model.

This multiple regression model was significant (p = 0.000) and 19.1% (R^2 = 0.191) of the variation in individual innovative behaviour was explained by the independent variables entered into this model (namely LMX, organisational support, organisational resources, and the internal and external thinking styles). It was also evident that the significant predictors of innovative behaviour were organisational resources (t = 2.983; p = 0.003); internal thinking style (t = 3.364; p = 0.001); and external thinking style (t = 3.154; p = 0.002). Organisational resources had the highest standardized Beta value (β = 0.227) therefore contributing the most to explaining innovative behaviour, followed by internal thinking style (β = 0.211) and external thinking style (β = 0.199).

LMX, organisational support and resources, and leanings as potential predictors of innovative behaviour

The fifth regression model (Model 5) considered LMX, organisational support, organisational resources, and the liberal and conservative thinking styles (which form the 'leanings' cluster) as predictors of individual innovative behaviour. The results are presented in Tables 24 and 25 below.

Table 24

Model 5 Summary

Model	R	R^2	Adjusted R^2	Std. Error	Sig.
5	0.598	0.358	0.344	9.508	0.000

Table 25

Coefficients and collinearity diagnostics for Model 5

Model	Unstandardized		Standardized			Collinearity Diag.		
	B	Std. Error	Beta	t	Sig.	Tol.	VIF	Cond. Ind.
(Constant)	15.794	4.749		3.326	0.001			1.000
LMX	0.224	0.115	0.121	1.951	0.052	0.708	1.413	7.997
Org. Support	0.008	0.073	0.008	0.110	0.913	0.496	2.015	10.944
Org. Resources	0.633	0.179	0.231	3.529	0.001	0.630	1.586	12.390
Liberal	0.719	0.076	0.496	9.480	0.000	0.991	1.009	18.905
Conserva.	-0.045	0.067	-0.036	-0.679	0.498	0.949	1.054	21.422

Tables 24 and 25 above illustrate the findings for the fifth multiple regression model. Regarding multicollinearity, it is noteworthy that the condition index did not exceed 30; no tolerance values were less than or equal to 0.1; and the VIF values were not greater than 5; as such multicollinearity was deemed to be unproblematic for this model.

The model was significant ($p = 0.000$) and the R^2 was 0.358, indicating that the independent variables entered into this model (namely LMX, organisational support, organisational resources, and the liberal and conservative thinking styles) explained 35.8% of the variance in individual innovative behaviour. It was also evident that the significant predictors of innovative behaviour were organisational resources ($t = 3.529$; $p = 0.001$) and liberal thinking style ($t = 9.480$; $p = 0.000$). In terms of the standardised Beta values it appeared that liberal thinking style had a higher Beta value ($\beta = 0.496$) than organisational resources ($\beta = 0.231$) thus indicating that liberal thinking style contributed more to explaining innovative behaviour.

CHAPTER FOUR – DISCUSSION

Broadly speaking, this research was conducted in order to try to unpack a pivotal contributing factor to organisational success, innovation; specifically individual innovative behaviour. This research looked to contribute further to the theoretical understanding of self-reported individual innovation through assessing levels of innovative practice within the sample as well as establishing whether certain factors, namely thinking style (individual/ internal), climate for innovation (climate-based/ external), and leader-member exchange quality (leadership/ external), were related to and could predict individual innovative behaviour in a South African sample. The total sample comprised 265 employees working in a South African organisation whose line of work fell within management, product development and/or design, consulting, strategising, advertising, or marketing (in any field). These participants were obtained through non-probability, volunteer, convenience sampling. Using the data obtained from the scales used to measure individual innovation, thinking style, climate for innovation, and leader-member-exchange (LMX) quality; statistical analyses were run. The results of these analyses, that is, descriptive statistics, frequencies, Pearson's correlation coefficients, and multiple regressions, and their implications, will be discussed in this chapter.

Contextualising the results

The four scales used in this study, namely the Self Report Measure of Individual Innovative Behaviour; the Leadership-Member Exchange Questionnaire; the Climate for Innovation Measure; and the Thinking Style Inventory yielded sufficiently high Cronbach Alphas thus indicating that they were reliable and acceptable to use in this South African study (Gravetter & Forzano, 2009). For all of the scales used, the majority of the Cronbach Alphas were very strong (above 0.81) (Murphy & Davidshofer, 2005; Nunnally, 1978). However there were a few exceptions, namely organisational resources ($\alpha = 0.72$), and certain thinking style subscales specifically judicial ($\alpha = 0.77$), monarchic ($\alpha = 0.74$), local ($\alpha = 0.75$), global ($\alpha = 0.77$) and anarchic (0.67). These Cronbach Alphas still indicated moderate internal consistency as they were above 0.7 (Murphy & Davidshofer, 2005; Nunnally, 1978). Moreover, one thinking style subscale, anarchic, produced a Cronbach Alpha of 0.67 which is a low to moderate reliability, however the subscale was still deemed useful to include in the study given its theoretical

significance. Overall, the four scales produced internally consistent reliable results which served as confirmation that the four constructs (innovative behaviour, LMX, climate for innovation (which will now be referred to in terms of its subscales organisational support and organisational resources), and thinking styles) were adequately assessed in the study (Gravetter & Forzano, 2009).

Levels of innovative behaviour, LMX, organisational support, organisational resources, and thinking styles in the sample

In order to determine whether relationships existed between the various constructs, levels of the constructs were first ascertained from the sample through the running of descriptive statistics and histograms. Overall these demonstrated that the majority of the data was normally distributed. This was expected as the sample size was relatively large. However, there were three exceptions; LMX, the liberal thinking style, and the legislative thinking style all displayed slightly high levels of their respective constructs. This may have been due to the nature of the sample as the sample was clustered towards the types of jobs that require innovation; therefore perhaps participants tended to operate utilising novelty and ambiguity (liberal thinking style) as well as creative strategy (legislative thinking style) more frequently (Sternberg, 1999; Sternberg & Wagner, 19991). Moreover, since a large portion of the sample were individuals who held positions of authority (47.2%), the LMX levels may have been slightly high because the nature of the sample's work required them to form strong interpersonal relationships and to be skilled in interpersonal interaction (Horton & Brown, 1990; Hunt & Baruch, 2003; Mom, van den Bosch, & Volberda, 2009).

Innovative practice in the sample

In order to explore self-reported individual innovative behaviour, the frequencies of the Self Report Measure of Individual Innovative Behaviour scale were assessed in order to ascertain which individual innovative practices were reported as occurring most frequently within the sample. As such, the general patterns of response frequencies for each response option on each item were considered and a combined frequency of participants answering 'Very Often' and 'Always' were calculated for each of the fourteen innovative practices listed in the scale.

Upon considering the pattern of the raw frequencies for each item, it was noted that the majority of participants reported engaging in each of the innovative behaviours at least 'sometimes' or more frequently ('sometimes'; 'fairly often'; 'very often'; and 'always'). This suggests that the sample gathered for this research was an appropriate sample as the participants were employees who were both required to engage in innovative behaviour and reported doing so on a relatively frequent basis.

It is interesting to note that upon ranking the items from those most frequently reported to those less frequently reported, and given careful consideration as to which behaviours were reported as being engaged with more and less frequently, trends began to emerge from the data. It appeared that there was an overall general pattern: the more frequently reported behaviours were generally seen to be the behaviours that could be argued to define the initial phase of the innovation process and the behaviours that were found to be reported slightly less frequently were behaviours that were seen to actualise the latter phases of the innovation process.

Subramaniam & Youndt (2005) discuss the innovation process and how there are no set rules for this; instead it occurs as a result of a fluid and non-linear process (King, 1992). This involves individuals developing the spark of an innovative idea and then this idea eventually matures and advances until it is ultimately implemented to create a beneficial development for the organisation (Anderson et al., 2014; King, 1992; Scott & Bruce, 1994; Subramaniam & Youndt, 2005; West, 2002). In line with this idea, it can be argued that generally speaking the 'popular' innovative behaviours (those reported most frequently) tended to revolve around individuals developing an initial innovative idea whereas the slightly less 'popular' behaviours tended to be centred around the individuals engaging in behaviours required to implement the idea to the point where its shortcomings could be eliminated and it could propel the organisation's development. The behaviours that seemed to mediate these two phases of innovation, in other words those behaviours that are seen to provide for the initial idea to mature and advance, appeared to be moderately popular in terms of how often these behaviours were reported.

In terms of the most 'popular' behaviours, generating ideas (ranking 1), looking for and recognising opportunities to do something beneficial and new for the organisation (ranking 2 and 3), as well as defining problems more broadly in order to find the deeper understanding of the issue (ranking 4) can all be seen as behaviours that individual employees engage in in order to contribute to the conceptualisation of an innovative idea, the initial phase of the innovation

process, which could ultimately translate into generating a productive and positive solution or change in the organisation (Anderson et al., 2014; King, 1992; Scott & Bruce, 1994; Subramaniam & Youndt, 2005; West, 2002).

In contrast, the nature of the least reported items seemed to deal with the more challenging step of the innovation process, that being the actual implementation of the effective and beneficial idea. In other words, the behaviours of evaluating the strengths and weaknesses of the new idea (ranking 11), working the bugs and weaknesses out of the new idea (ranking 13) as well as testing out the new idea (ranking 14), are all behaviours that contribute towards the innovative idea being successfully implemented and put into practice, and all were reported as being enacted less frequently in the sample. Paying attention to non-routine issues (ranking 12) is also a more difficult and cognitively demanding task to engage in and as such it fits to see this behaviour being reported less frequently within the sample (Anderson et al., 2014; King, 1992; Scott & Bruce, 1994; Subramaniam & Youndt, 2005; West, 2002).

The middle phases of the multidimensional innovation process, whereby the nuances of the initial idea are developed and various tools and support structures are outsourced and put in place, such as attaining strong organisational support and belief in the idea, were found to be reported at a frequency that was average (i.e. not within the highest or lowest reported frequencies). For example, persuading others of the importance of the idea (ranking 6) refers to developing strong organisational support for the idea; and experimenting with the new idea (ranking 7) refers to working with the idea in order to clarify its nuances and define it more clearly (Anderson et al., 2014; King, 1992; Scott & Bruce, 1994; Subramaniam & Youndt, 2005; West, 2002).

When comparing how an individual engages in the idea generation phase of the innovation process and the implementation phase of the innovation process, it is argued that the behaviours required to implement the idea are more cognitively challenging (Edquist, 2010; Klein & Sorra, 1996; Shalley, 1991) Generally speaking, this is because when comparing the successful manifestation of the innovation implementation behaviours to the successful development of the initial conceptualisation of the fresh idea, the implementation phase requires more cognitive and physical effort, as well as more time and more money. As such, the behaviours that define this phase tend to be more difficult as they are geared towards overcoming the obstacles that prevent the successful actualisation of the innovative idea (Edquist, 2010; Klein & Sorra, 1996; Morris, Kuratko, Covin, 2010; Shalley, 1991) As such, it makes sense that the implementation

behaviours were less frequently reported than the idea conceptualisation behaviours that were more frequently reported in the sample, and that the behaviours that ultimately merge these two phases were reported with moderate frequency.

It is perhaps also worth noting that when looking at the most frequently reported behaviours, generating problem-solutions, looking for and recognising opportunities for improvement, and making a positive difference, as well as defining problems more broadly, all of these seem to be behaviours that are seen to be very positive and, as such, favourable to report doing. This idea, together with the nature of the self-report scale allowing participants to more easily report desirable answers (Ong & Dulmen, 2006), raises the question as to whether there may be some sort of response bias within participants' responses. Response bias occurs when people answer questions in particular patterns in terms of what they think is desirable or appropriate (Monette, Sullivan, & DeJong, 2010; Zikmuns & Babin, 2012). As such, perhaps the conceptual behaviours of innovation were more frequently reported due to the fact that participants wanted to appear as though they were engaging in such desirable behaviour and it was easier to claim to think in a certain way (look for opportunities to do something beneficial for the organisation) than to act in a certain way (test out new ideas).

The relationships between innovative behaviour, organisational support, organisational resources, LMX, and thinking styles

After calculating Pearson's correlation coefficients, innovative behaviour was found to be significantly, weakly, and positively related to organisational support, organisational resources, and LMX, which suggests that increased self-reported individual innovative behaviour was associated with increased organisational support, increased organisational resources, and a better quality of LMX (fully supporting Hypotheses 1 and 2).

Stemming from the literature, these relationships were mostly in line with what had been previously established and, as such, what was anticipated in the current research. These findings were also in line with what was proposed in the theories, specifically Amabile's (1996) componential model of creativity and Sternberg's (2006) investment theory, regarding the link between external climate and leadership based factors, and innovation.

In terms of organisational climate and its relationship to innovation, literature that spans over a long period of time has illustrated the association between innovative behaviour and various

aspects of the construct of organisational climate. Ahmed (1998), Chien, Tsai, and Chin (2013), Damanour (1991), Hunter et al. (2007), Kheng and Mahmood (2013), Martin and Terblanch (2003), and Naranjo-Valencia et al. (2011) are a few studies that have considered the broad construct of organisational climate and its association to innovative behaviour. Moreover there are also studies that have specifically looked at organisational support (Yuan & Woodman, 2010) and organisational resources (Hammond et al., 2011) and found that these aspects of organisational climate are also associated with innovative behaviour. The empirical support found for the significant relationship between innovative behaviour and organisational climate indicates that nurturing a desired organisational climate can deliver innovation of an amplified, reliable, and steady quality (Ekvall, 1996; Klein & Sorra, 1996; Oldham & Cummings, 1996; Shneiderman, 2007; van der Sluis, 2004).

In this way it appears that the current research aligns strongly with past research findings. It is however relevant to note that in terms of Scott and Bruce (1994), although support for innovation was found to be significantly positively associated with individual innovation, resource supply was not found to be significantly linked to increased individual innovative behaviour. The disjunction in findings is indicative of the need for further research into the construct of resource supply for individual innovation in order to more meaningfully understand the nuances of this relationship.

In terms of the relationship between innovative behaviours and LMX, the findings of this research appeared to align strongly with current literature and with what was expected. This is because in line with the overall findings of Basu and Green (1997); Hammond et al. (2011); Kheng & Mahmood (2013); Sanders et al. (2010); Schermuly et al. (2013); and Scott and Bruce (1994), this study illustrated that LMX was found to be significantly, weakly, and positively related to innovative behaviour within a South African sample of employees.

The theory supports a link between LMX and innovation because it can be argued that the quality of the relationship between a leader and a follower (the employee) strongly affects the behavioural outcomes of the employee and their organisation (Dansereau et al., 1975; Graen & Scandura, 1987; Graen & Uhl-Bien, 1995). This is because through the quality of the relationship between a supervisor and their subordinate, the understanding of what each person's role is can be established, allowing the employee to feel empowered to explore their autonomy and decision latitude, and ultimately enhancing their 'creative juices' (Graen & Uhl-Bien, 1995; Graen & Cashman, 1975). Graen and Uhl-Bien (1995) argue that when one pays

careful attention to the practices of leadership, organisational creativity has an increased potential to be positively affected, as it is probable that the employee will feel more comfortable in taking the risks related to exploring their innovative thoughts, ideas, and behaviours. This is because the employee is likely to feel more positive regarding how their behaviour will be viewed by their leader (Gumusluoglu & Ilsev, 2009; Oldham & Cummings, 1996; Redmond et al., 1993). In this way, the quality and dynamics within the dyadic relationship between an employee and their leader (LMX) is crucial to the likelihood of the employee actively engaging in innovative behaviour. As such, the organisational implication of this finding is that the organisation, specifically management, should be extremely mindful and conscious of building a high quality relationship with their subordinates to encourage individual innovative behaviour.

The relationships between innovative behaviour and the different thinking styles were also calculated. The Pearson's correlation coefficients obtained indicated significant, weak, and positive relationships between innovative behaviour and the anarchic, global, internal, and external thinking styles; significant, moderate, and positive relationships between innovative behaviour and the legislative, judicial, and hierarchical thinking styles; and a significant, moderate-strong, and positive relationship between innovative behaviour and the liberal thinking style (providing partial support for Hypotheses 3 and 5). However, the conservative, executive, monarchic, oligarchic, and local thinking styles appeared to be unrelated to innovative behaviour (non-significant correlations) (negating Hypothesis 4 and partially negating Hypotheses 3 and 5).

In terms of current literature, there does appear to be research on how various facets of an individual's cognition may be associated with innovative behaviour (Ettlie et al., 2014; Clegg et al., 2002; Miron-Spektor et al., 2011; Riding & Wigley, 1997; Scott & Bruce, 1994; Wu et al., 2014). However, there does not appear to be a considerable amount of research that has explored the links between thinking styles as defined by the theory of mental self-government which ultimately gave rise to Sternberg's thirteen styles of thinking (Sternberg, 1999; Sternberg & Wagner, 1991; Zhang, 2004) and individual innovative behaviour specifically. Therefore, there was very little (essentially no) direct empirical literature to suggest which of the thirteen thinking styles would be related to innovative behaviour or what the nature of these relationships would be.

Nevertheless, significant, positive relationships, varying in strength, were found between innovative behaviour and certain of the thinking styles; and these results were partially aligned to the theoretical predictions discussed in the literature review. As was expected, the legislative, judicial, anarchic, global, external, and liberal thinking styles were significantly and positively associated with innovative behaviour (Anderson et al., 2014; King, 1992; Kleysen & Street, 2001; Scott & Bruce, 1994; Sternberg, 1999; Sternberg & Wagner, 1991; Subramaniam & Youndt, 2005; West, 2002).

This was expected as the legislative thinking style refers to an individual preferring to engage in work that allows them to structure their own approach to the problem and as such develop fresh and new ideas (Sternberg, 1999; Sternberg & Wagner, 1991). Moreover, an individual who enjoys tasks that require evaluating, judging and analysing (judicial) would logically tend to enjoy the implementation phase of the innovative process, such as evaluating the strengths and weaknesses of the innovative idea (Kleysen & Street, 2001; Sternberg, 1999; Sternberg & Wagner, 1991; Subramaniam & Youndt, 2005). A thinking style where the individual prefers to be stimulated by a range of tasks and can challenge the system (anarchic) could also be linked to aspects of innovation that involve defining problems more broadly to gain greater insight and paying attention to non-routine issues (Kleysen & Street, 2001; Sternberg, 1999; Sternberg & Wagner, 1991).

Individuals who prefer to work in a world of conceptual ideas and thus tend to approach problems in an abstract and broad manner (global) would engage in the process of idea generation, linked to innovation (Kleysen & Street, 2001; Sternberg, 1999; Sternberg & Wagner, 1991). Individuals who are generally extroverted and more orientated towards working to develop interpersonal relationships (external) would also be associated with innovative behaviour as their engagement with others is likely to stimulate and inspire creative thoughts and behaviours (Sternberg, 1999; Sternberg & Wagner, 1991). Lastly, individuals who are comfortable and in fact prefer working with a degree of unfamiliarity (liberal) are more associated with innovative tendencies due to the fact that they tend to welcome and adapt to new thinking (Sternberg, 1999; Sternberg & Wagner, 1991).

The oligarchic and local thinking styles were hypothesised to encourage innovative behaviour however the results in this study indicated that there were in fact no significant relationships between these thinking styles and innovation. This could have been because an individual who operates from the oligarchic thinking style appears to have no set or clear priorities and prefers

to work on everything simultaneously (Sternberg, 1999; Sternberg & Wagner, 1991). As such perhaps this individual has difficulties in actually developing new ideas, building a structure for an idea to grow, or working out the intricate weaknesses of the innovative idea (Subramaniam & Youndt, 2005). The local thinking style could have been unrelated to innovation because perhaps, for an individual working from a local perspective, their focus on specific, concrete, and fine details actually obscures and inhibits their recognition of fresh approaches and original thinking (Sternberg, 1999; Sternberg & Wagner, 1991).

Moreover, it was expected that the executive and conservative thinking styles would inhibit innovative behaviour (Sternberg, 1999; Sternberg & Wagner, 1991); however the results from the correlations indicated that in fact there were no significant relationships between these two thinking styles and innovative behaviour. This suggests that the executive and conservative thinking styles may not be as counter-productive to producing innovative behaviour as suggested by the theory; although these two thinking styles would not promote innovative behaviour either.

The possible relationships between innovative behaviour and the monarchic, hierarchic, and internal thinking styles were unclear from the literature. The results showed that there was no significant relationship between innovative behaviour and the monarchic thinking style, supporting the lack of a theoretical link. There were, however, significant, positive relationships found between innovative behaviour and the hierarchic and internal thinking styles. An individual who uses the hierarchic style prefers to work on tasks in a systematic and organised manner ensuring that the appropriate tasks are prioritised and allocated the appropriate resources (Sternberg, 1999; Sternberg & Wagner, 1991). It can be argued that perhaps this style of thought is positively related to innovative behaviour because if a hierarchic individual recognises an innovative task as important, they will ensure that this is prioritised and that the appropriate resources to achieve the task are allocated. An individual who engages in an internal thinking style has a preference for working on tasks independently (Sternberg, 1999; Sternberg & Wagner, 1991), which may lead the individual to work harder in order to ensure that they are performing optimally. The individual may feel that they need to prove to their manager that they can be as effective working independently as another person can be working within a group and as such, this may lead the individual to think in creative ways and independently come up with fresh ideas and solutions. In this way it appears that both scope of thinking styles (internal and external) can be associated with an increase in individual innovative behaviour.

It is significant to note that the overall findings between the various thinking styles and innovative behaviour provide empirical support for the notion that innovation / creativity stems, at least partially, from characteristics and traits within the individual, as was discussed in Amabile's (1996) componential model of creativity and Sternberg's (2006) investment theory.

Factors predicting innovative behaviour

Due to the various relationships that were found to exist between the thirteen thinking styles as well as the inter-relationships between organisational support, organisational resources, LMX, and the thinking styles, the researcher ensured that caution was taken so as to avoid the risks of multicollinearity. As a result, five separate multiple regressions were run. The organisational climate variables (organisational support and organisational resources) as well as LMX were used for all of the five models, however the thirteen thinking styles were grouped and entered in terms of their five clusters (leanings, forms, functions, levels, and scopes).

All five of the models calculated were significant overall. The coefficients of determination (R^2) ranged between approximately seventeen and thirty-six percent, suggesting that the predictors in the various models accounted for between seventeen and thirty-six percent of the variation in individual innovative behaviour (Nagelkerke, 1991).

For model one, LMX, organisational resources, legislative thinking style, and judicial thinking style were found to be significant, positive predictors of innovative behaviour; and executive thinking style was found to be a significant, negative predictor of innovative behaviour. In terms of model two, it was found that the significant, positive predictors of innovative behaviour were organisational resources and hierarchical thinking style. For model three, there were two significant, positive predictors of innovative behaviour, namely organisational resources and global thinking style. Moreover, model four showed that the significant, positive predictors of innovative behaviour were organisational resources, internal thinking style, and external thinking style. Lastly, according to model five the significant, positive predictors of innovative behaviour were organisational resources and liberal thinking style. It is interesting to note that across all five of the models, a mixture of external and internal factors was found to predict innovative behaviour. This aligns with the theories proposed by Amabile (1996) and Sternberg (2006), and the model proposed by Scott and Bruce (1994).

It is interesting to note that these findings demonstrated that within all five models, organisational support was never a significant predictor of innovative behaviour and organisational resources was always a significant predictor of innovative behaviour. This suggests that within the sample a supportive climate for innovation was not key to the employees engaging in innovative behaviours; however what was crucial in predicting whether an organisation's employees behaved innovatively, regardless of which thinking style was utilised, was that the organisation provided appropriate resources such as time, personnel and funding (Scott & Bruce, 1994; Siegal & Kaemmerer, 1978). These results were contrary to what was expected based on theory as both organisational support and organisational climate were expected to predict innovative behaviour (Hammond et al., 2011; Yuan & Woodman, 2010). One possible reason for this unexpected result is that there may have been a statistical issue such as multicollinearity (Matignon, 2005). It is important to note, however, that multicollinearity was carefully monitored and the results were consistent for each of the five models, so this explanation seems unlikely.

These findings also appear to directly contradict the findings of Scott and Bruce (1994) which established that support for innovation was positively associated with innovative behaviour while resource supply was not significantly related to innovative behaviour. As such, the question arises as to why these studies differ, especially bearing in mind that they utilised the same scale to measure organisational climate. Perhaps the difference lies within the context of both studies as the current study was a South African study where participants were employees from a variety of organisations working within jobs that were innovatively inclined, and the sample used by Scott and Bruce (1994) were all engineers, scientists, and technicians employed by a single large centralised R & D facility of a major industrial corporation in the United States. The findings may therefore have been misaligned due to the different samples having different characteristics, such as the employees' type of work or organisational climate. It is important to note that, where the current research sample was obtained from different organisations in South Africa, the sample obtained in Scott and Bruce (1994) came from only one organisation and thus the findings in Scott and Bruce (1994) may have been peculiar to the specific group and location that they sampled. In this way it is argued that there is a strong need for further research to investigate the same relationships using different samples/conditions that vary in terms of the participants' type of work or work environment.

It is also important to note that Scott and Bruce's (1994) research is over twenty years old and, as such, their research runs the risk of being outdated. Within the last twenty years, there has

been a huge shift in organisations to strive for innovation so as to develop and maintain success (Beckman & Barry, 2007; Kheng & Mahmood, 2013; Miller & Wedell-Wedellsborg, 2013). Innovation has also become far more embedded in people's jobs and especially within an organisation's consciousness (Beckman & Barry, 2007; Bessant & Tidd, 2011; Kheng & Mahmood, 2013). Since the sample gathered was one that was required to engage in innovative work due to the nature of their jobs, the organisational support amongst this particular sample for individual innovation was likely to be naturally high. As such, it can be argued that the supportive climate, at least within this particular sample, was perhaps taken for granted as employees already knew that they would be encouraged to engage in innovative behaviour and it was desired and rewarded. It can therefore be suggested that within the last twenty years there has been a shift of focus from the employee looking to the organisation to simply inspire or support innovation to the employee looking to the organisation to provide the appropriate resources to engage in innovative behaviours (Beckman & Barry, 2007; Bessant & Tidd, 2011; Kheng & Mahmood, 2013; Miller & Wedell-Wedellsborg, 2013).

Another interesting finding was that LMX was only found to predict innovative behaviour when it was included in conjunction with the thinking style 'functions' cluster (model 1). This was not what was anticipated from the literature as LMX was expected to predict innovative behaviour in all circumstances and, as such, in all models (c.f. Basu & Green, 1997; Hammond et al., 2011; Kheng & Mahmood, 2013; Sanders et al., 2010; Schermuly et al., 2013; Scott & Bruce, 1994). The functions thinking styles refers to the preferred approaches an individual has towards engaging with a task (Sternberg, 1999; Sternberg & Wagner, 1991). In other words they either prefer to create new approaches to engaging with the task (legislative), or they prefer to complete the task by following existing rules (executive), or they prefer to approach their task in terms of evaluating and analysing what procedures or ideas already exist and critiquing these (judicial) (Sternberg, 1999; Sternberg & Wagner, 1991). The extent to which this preference for approaching a task can be expressed may link closely with the nature of the relationship the employee has with their leader because this relationship (LMX) encompasses the amount of autonomy and decision latitude the employee is allowed to act upon (Dansereau et al., 1975; Graen & Scandura, 1987; Graen & Cashman, 1975; Graen & Uhl-Bien, 1995). In other words, the extent to which an individual's leader is flexible in allowing them to be creative in their approach to their task (and in which functions style they adopt) may determine their likelihood of engaging in innovative behaviour.

Regarding the regressions of the thirteen thinking styles, grouped into the five clusters; as established above, eight of the thinking styles were found to be significantly related to innovative behaviour (namely legislative, judicial, anarchic, global, external, liberal, hierarchical, and internal); and seven of these thinking styles were also found to predict innovative behaviour. This is with the exception of the anarchic thinking style which did not predict innovative behaviour. This was an unexpected yet interesting finding. As noted, the anarchic thinking style is where an employee has a preference for working on tasks that do not require a structured system (Sternberg, 1999; Sternberg & Wagner, 1991). Perhaps it can be argued that not requiring a structured system is *associated* with how creative one may be in allowing ideas within one task to stimulate ideas within another task; however this unstructured thinking system does not specifically *predict* whether the individual will in fact engage in innovative behaviour in terms of allowing different task ideas to facilitate innovation. Furthermore perhaps the anarchic style was not found to predict innovative behaviour within its model (model 2) because when it was considered with the other variables, namely LMX, organisational support, organisational resources, monarchic, hierarchical, and oligarchic, the shared variance of all the predictors resulted in a lack of prediction of the anarchic style. In other words, multicollinearity might have played a role despite the considered indicators suggesting that it was not highly problematic (Graham, 2003; Matignon, 2005; Smart & Tierney, 2002).

Furthermore, in line with the correlation results indicating no significant relationships with innovative behaviour, the oligarchic, conservative, monarchic, and local thinking styles were also not significant predictors of innovative behaviour. These findings were expected; however a further unexpected finding was that the executive thinking style was found to significantly predict innovative behaviour even though it was not found to have a significant correlation with innovative behaviour. Moreover a negative Beta value was found indicating a negative relationship between the two variables. The executive thinking style operates within an employee when they prefer and are more concerned with implementing tasks under a given set of guidelines or rules (Sternberg, 1999; Sternberg & Wagner, 1991). Although this style was initially hypothesised to be negatively related to innovative behaviour, the correlation produced an unexpected insignificant result. Nevertheless the regression showed that the executive thinking style did in fact negatively predict innovative behaviour, in other words, an increase in the executive thinking style would result in a decrease in innovative behaviour. Therefore it appears that the executive style of thought moved beyond not being related to innovative

behaviour and instead was established to be a suppressor of innovative behaviour, as was initially anticipated, once considered in conjunction with other predictors of innovative behaviour.

In line with this finding it can be argued that an employee who operates using high levels of the executive style of thinking, displaying a preference for working on structured and methodological tasks, will evidence low levels of individual innovative behaviour. As a result, the executive style of thinking is not a desirable style of thought in circumstances where organisations want to encourage employees to think creatively or innovatively. It is also interesting to note that the executive thinking style, being rule- and routine-bound, is very similar in nature to the systematic problem-solving style considered in Scott and Bruce's (1994) study, whereby an individual prefers to work within established methods and procedures. The findings in the current study align with one of Scott and Bruce's (1994) findings, namely that the systematic problem-solving style was found to significantly and negatively predict innovative behaviour. This lends further support to the notion that in organisational situations where innovative behaviour is favoured, the executive thinking style (where the individual is guided by established rules and procedures) is not a style of thought that should be encouraged.

Conclusions

This research was conducted in order to provide deeper insight into the multi-dimensional construct of innovation within an organisation since innovative behaviour within an organisation is a key driver to the organisation's profitable success (Gumusluoglu & Ilsev, 2009; Morgan, 2006; Oldham & Cummings, 1996; Scott and Bruce, 1994; Tierney et al., 1999). In line with Rothearmel and Hess (2007), it is argued that an organisation's innovative behaviour is driven by the individuals who make up the organisation; the employees. Thus this research investigated both external factors (organisational climate and LMX) and an internal factor (thinking styles) that were hypothesised as being related to and/or able to predict individual innovative behaviour; as well as which individual innovative behaviours were reported as being enacted most frequently within the research sample.

This research confirmed that all three variables, namely organisational climate, LMX, and thinking styles, were uniquely related to / predictive of individual innovative behaviour; and

produced some interesting findings that may be useful in understanding how an organisation can work towards achieving effective practices to encourage individual innovative behaviour.

The organisation's climate is understood as the manner in which employees cognitively represent their organisational setting. This representation has been argued to influence the employees' work habits (innovative tendencies) (Hunter et al., 2005; Hunter et al., 2007; Mathisen & Einarsen, 2004; Oldham & Cummings, 1996; Scott & Bruce, 1994; Tierney et al., 1999). Although organisational support for innovation did not predict innovative behaviour in this study, possibly as a result of the specific nature of the sample, it can still be argued to be related to innovative behaviour and, as such, the organisation should be mindful of how their climate is defined. However organisational resources was found to be both related to and a predictor of an employee's innovative tendencies; therefore organisations are strongly advised to be exceptionally cognisant of ensuring that the resources that could assist employees to engage in innovative behaviour**,** such as time, personnel and funding**,** are readily and consistently available (Scott & Bruce, 1994; Siegal & Kaemmerer, 1978).

Furthermore participants reported that they engaged more frequently in the conceptual / initial phases of innovation and less frequently in the implementation / latter phases of innovation; possibly because they perceived that they did not have the resources to implement their innovative ideas. It has been shown that within the current research sample, organisational resources was a predictor of innovation; thus perhaps participants did not feel that their organisations provided sufficient capacity to allow them to engage in the implementation of innovation as opposed to simply the conceptualisation thereof. Another possible explanation for participants reporting more engagement in the conceptual phase of innovation might be the degree of difficulty and effort involved in this part of the innovation process in comparison to that required in the latter parts linked to implementation (Anderson et al., 2014; King, 1992; Scott & Bruce, 1994; Subramaniam & Youndt, 2005; West, 2002). This could imply that organisations need to try find methods and tools to provide for and encourage employees to engage in both the conceptualisation and implementation of innovation. This may require organisations to analyse and adapt their contextual influences (such as through ensuring that the appropriate resources are available) as well as to provide employees with the opportunities to develop the personal factors that contribute to engaging in this process (such as ensuring that employees are trained to think in certain ways). This may reduce the difficulty and challenges of the latter phase in the hope that this phase will be engaged with more frequently.

The established significant relationship between LMX and innovative behaviour illustrates the importance of the organisation ensuring that the quality of the relationship a leader has with his follower (employee) is high in that it is defined in such a way that there is a clear understanding of each person's role. This is because, in line with Graen and Uhl-Bien (1995) and Graen and Cashman (1975), this positive relationship enhances the employee's innovative tendencies. As such, it is argued that organisations should encourage managers to develop a positive relationship dynamic with their subordinates to ensure that their subordinates are comfortable in an open, communicative relationship (Gumusluoglu & Ilsev, 2009; Oldham & Cummings, 1996; Redmond et al., 1993). Moreover, management should also be mindful and cognisant of their subordinate's style of thought. This is because when their subordinate operates from one of the functions of thinking styles (namely the legislative, executive, or judicial thinking style), the quality of the relationship that their subordinate has with their manager can work together with this style of thought preference to predict the subordinate's likelihood of engaging in innovative behaviour. Consequentially, the results of this study indicate that within an organisation, LMX should be honed and carefully managed.

Furthermore, the findings regarding the nature of the relationships between the various thinking styles and innovative behaviour can be applied within the organisational practices of recruitment and selection, as well as training and development. Selecting the appropriate applicants to employ is crucial to an organisation's success (Compton, Morrissey, Nankervis, & Morrissey, 2009). This is because, as has been explained, the employee work force of an organisation is the foundational driving force of the organisation building and maintaining an innovative competitive advantage (Anderson et al., 2004; Gumusluoglu & Ilsev, 2009; Hammond et al., 2011; Morgan, 2006; Tierney et al., 1999; West, 2002; Xerri & Brunetto, 2011). It has been proposed that, in line with the research of Carmeli et al. (2006), Gardner (2005), Patterson et al. (2009), and Yesil and Sozbilir (2013), an organisation should carefully consider who makes up their human resources as organisational innovation originates within the employees of the organisation. It is thus argued that since certain thinking styles (legislative, executive, judicial, global, external, liberal, hierarchical and internal) have been identified as predicting innovative behaviour, it may be useful for organisations to incorporate the consideration of potential employees' thinking styles into their recruitment and selection process.

Moreover, since several of thirteen thinking styles were found to be related to and predictive of innovative behaviour, it can be argued that an organisation should also pay careful attention

to the thinking styles of their current employees. The organisation's innovative process is a knowledge-intensive process that is driven by the intellect of employees (Bharadwaj & Menson, 2000; Hitt et al., 2001; Kheng & Mahmood, 2013; Rothaermel & Hess, 2007; Simon, 1991; Sousa & Coelho, 2011). In this way, creating and growing knowledge within the organisation is very important (Grant, 1996). Since thinking styles can be learnt and taught (Cano-Garcia, & Hughes, 2000; Riding, & Sadler-Smith, 1997; Sternberg, 1994a; Sternberg, 1999), organisations could be advised to design training programs to teach their employees appropriate thinking styles to adopt in cases where innovation is required or desired. In other words, employees should be encouraged to adopt legislative, judicial, hierarchical, global, internal, external, and liberal thinking styles and should be trained to avoid thinking in the executive thinking style (as it had a negative predictive relationship with innovative behaviour) if innovative behaviour is the desired outcome. In this way employees of the organisation, who are the organisation's leading resource, will be more equipped to attain the competitive success that the organisation is striving towards (Anderson et al., 2014; Carmeli et al., 2006; Hammond et al., 2011). This success involves the organisation consistently adapting to their changing environment and constantly improving upon their operations (Beckman & Barry, 2007). Through the organisation training their employees to think in certain ways, the quality of their human capital's talent and skills could be enhanced, ultimately assisting the organisation in achieving its success (Gardner, 2005).

In this way, if employees can be trained to rely on the specific thinking styles that are predictors of innovative behaviour whilst engaging in relevant work activities, and provided that various other factors that have been shown in the literature to be related to innovative behaviour are also monitored and aligned to this goal, the broader organisational goal of innovation is more likely to be ascertained and positive and desirable organisational development can occur. It is thus important for an organisation to carefully nurture and develop their organisational environment as well as their organisational workforce.

In summation, through considering which individual innovative behaviours were reported to be engaged with more and less frequently within the research sample as well as through considering both the external factors (organisational climate and LMX) and an internal factor (thinking styles) that were hypothesised to relate to and predict levels of individual innovative behaviour within an organisation, a number of interesting findings were gathered. Firstly, this South African sample was seen to report engaging in innovative practices that are less cognitively challenging and tend to define the initial phases of innovation, namely the

conceptualisation and generation of innovative thoughts and ideas, as opposed to the more cognitively difficult behaviours that tend to define the latter phases of innovation such as the implementation of the initial innovative idea. Moreover, although organisational support for innovation was found to be related to innovative behaviour, it was not found to predict innovative behaviour, however; organisational resources for innovation was found to be both related to and predictive of innovative behaviour, stressing its importance in promoting innovative behaviour. Furthermore, although LMX was found to be related to innovative behaviour, it was only found to be a predictor of innovative behaviour when it was grouped with the functions thinking style cluster. Additionally, different thinking styles were found to be related to as well as predictive of innovative behaviour; providing some of the only empirical support for the nature of these relationships to date.

On this basis, it can be argued that an organisation that is striving to encourage and promote innovative behaviour should be cognisant of its organisational climate for innovation (specifically the resources that are available to assist employees engaging in innovative behaviour), of the quality of its leaders' relationships with their subordinates, as well as its workforce's thinking styles, particularly within the organisational practices of selection and recruitment, and training and development.

Strengths and limitations

The current study has been useful in determining both self-reported innovative behaviour in the South African context and the nature of its relationships with organisational climate for innovation, quality of leader-member exchange, and individual thinking styles. Through considering these findings, various strengths of this research can be elicited.

Firstly, this study managed to attain a large sample of employees whose work was of a creative nature. This was evident when considering the pattern of the raw frequencies of the self-reported individual innovative behaviour scale for each item where it was noted that the majority of participants reported engaging in the various behaviours at least 'sometimes' or more frequently. This indicated that the sample gathered was appropriate for the research and lent support to the findings since the data used to reach these was gathered from employees who seem to be engaging in innovative work fairly often. Moreover, the levels of innovative behaviour reported provided further insight into the broad construct of innovation in that it was

found that innovative behaviours that were more frequently reported were those behaviours that propel the innovative process but do not complete the process. In other words, it can be argued that a merit of this study lies in the ascertained pattern of innovative behaviour frequencies that were reported, that being that idea generation behaviours are engaged in more frequently than idea implementation behaviours.

The large sample size of 265 participants also contributed towards a strength of the study. This is because, according to Dattalo (2008), the power of the statistical findings of a research study that has a large sample is far greater than that of a small sample. A large sample is also more representative of the population from which it is drawn (Stangor, 2011).

Other strengths of this study are argued to lie within the contributing theoretical understanding of self-reported individual innovation in terms of establishing which external (organisational climate for innovation and leader-member exchange) and internal (individual thinking styles) factors were related to and could predict the individual innovative behaviour of a South African sample of employees. Through considering these relationships, some relatively unique conclusions were reached, which are argued to strengthen the merit of this research. Firstly it was interesting to establish that whilst organisational resources predicted innovative behaviour, organisational support did not predict innovative behaviour within the research sample. Moreover, LMX could predict innovative behaviour only when it was grouped with the thinking style functions cluster, namely the legislative, executive, and judicial thinking styles. Moreover perhaps the most valuable findings of this research stemmed from the results that considered the relationships and predictive ability of various individual thinking styles with innovative behaviour within South African employees. The manner in which thinking styles were conceptualised within this research, in terms of Sternberg's thirteen thinking styles, which was derived from the theory of mental self-governance, appeared to not have been previously considered within the current literature. Thus it is argued that a major strength of the current study lies within the way this research has begun to fill the gap in research that considers the relationship between innovative behaviour and thinking styles, specifically Sternberg's thirteen thinking styles.

The context of this research is argued to further contribute to the merit of this research. As was explained at the beginning of this research, innovation as an area of study, particularly in its association to organisational climate, LMX, and thinking styles, appears to be under-researched within South Africa and thus this research, which took place in a South African context, has

contributed further to the understanding of self-perceived individual innovation within a fairly unique setting. In this way, this research has provided a starting point from which one can work to ultimately develop organisational interventions, such as training programs, to promote individual innovative behaviour.

Although a large sample of an appropriate nature was eventually obtained, a major weakness of the current study lay within the difficulty of the sampling strategy and ultimately attaining the sample. Despite the researcher's extensive efforts to gain access into various organisations (between 15 to 20 organisations), this was repeatedly declined. As a result, the researcher was forced to implement other strategies to gather a sample. Furthermore, the length of the questionnaire made the process of gathering a sufficient sample size even more challenging as the response rate of individuals actually completing the entire questionnaire was low. Many questionnaires had to be removed from the data set due to chunks of the questionnaire being incomplete, and, as such, it took a long time for the researcher to attain a large sample size. This raises concerns as to the strength of the external validity of the study. The challenges faced in attaining the sample imply that inevitably those participants who were eventually obtained would not necessarily accurately represent the entire population as they may have had specific characteristics that were different to the general working population in South Africa. This limits the generalisability of this study to the broader working population and the context in which the findings of this study would be applicable.

A related limitation seen within the sample obtained for this study, raising concerns regarding generalisability of the findings, lies within the methodological sampling strategy that was employed. Non-probability sampling was used which does not allow every individual within the population to have an equal opportunity of being selected to participate in the study (Cozby, 2009; Stangor, 2011). Furthermore, there was no way to ensure that each potential element of the sample's characteristics had a chance of actually being included in the study (Rosnow & Rosenthal, 2005). Thus, although this was practically necessary, the external validity of the study is questionable (Stangor, 2011). This is because this sampling strategy limits the generalisability of the findings to the broader working population as well as to contexts of work that go beyond jobs that require creativity / innovation.

Additionally, the literature considered pertaining to the construct of innovation was seen to conceptualise innovation in various ways and, as such, to measure the construct in different ways. This study looked specifically at self-reported individual innovation which in itself could

have elicited certain response biases, resulting in a further limitation to this research (Monette et al., 2010; Zikmuns & Babin, 2012).

A further limitation in this study can be seen within the nature of the research design, that being a cross-sectional, correlational study, which does not provide for causality to be assessed and does not explain why the variables are related (Stangor, 2011). As a result, since this study does not provide for causal conclusions to be reached, one needs to be extremely cautious in the strengths of the causal claims made.

Directions for future research

In line with some of the fairly unique and interesting findings of this research, it can be argued that replicating this study or aspects of this study to confirm or extend its findings would benefit overall understanding of individual innovation, which could ultimately inform organisational development and success.

More specifically it is suggested that further research exploring the relationship between organisational climate (particularly in terms of organisational resources and organisational support) and individual innovation would be beneficial so as to provide more insight into the understanding of why the findings in this study misaligned with the findings of Scott and Bruce (1994) and what was expected based on available theory. Furthermore, in line with the finding of organisational resources predicting innovation, it would be interesting to further investigate which specific types of resources might be more or less predictive of innovative behaviour, for example, funding, personnel, time etc. Furthermore, the relationship between individual innovative behaviour and individual thinking styles appears to not have been deeply considered within the available literature, particularly in terms of Sternberg's thirteen styles of thinking. As such it is suggested that additional studies consider the intricacies of these relationships.

Moreover, since this study only considered two external factors (organisational climate and LMX) and one internal factor (thinking styles) in terms of how these factors relate to and could predict innovative behaviour, it could also be very useful to explore how various other internal (personal) and external (contextual) factors interact and relate to innovative behaviour (Egan, 2005). Insight into the interactions between the employee and their context can help provide a better understanding of how creativity unfolds within the working environment (Tierney et al., 1999). It is also suggested that considering all of the above relationships through applying a

qualitative research method could considerably contribute and add significant value to the current understanding of how these constructs interact (Creswell, 2009).

Additionally, it is proposed that considering the above relationships within different contextual settings, as well as obtaining samples with different characteristics, would contribute to research knowledge. This could assist with strengthening the generalizability and external validity of this research domain. For example, perhaps it would be useful to consider how the relationships established in this study might differ or be similar for different types of jobs or in different countries (such findings could also help explain the difference in findings between the current study and the findings from Scott and Bruce (1994) in terms of organisational climate).

Furthermore, Klijn and Tomic (2010) explain that although there is a large amount of literature on creativity and innovation, the models and theories that are defined have limited predictive value and thus the field of creativity requires a more in-depth focus where various results, models, and theories are synthesised in order to develop, promote, and predict creativity effectively. As a result it is suggested that future research further considers the predictive element of innovation in order to ascertain which specific aspects organisations can focus in on to help promote innovative behaviour within their employees. This type of research could eventually provide the basis for organisations to develop interventions, training programs, and /or recruitment strategies to ultimately enhance their workforce. For example, educating employees about different thinking styles as well as training employees to adopt specific styles of thought could enhance their innovative behaviours, thereby increasing the organisation's likelihood of reaching and maintaining profits and success.

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Appendix A: Access Request Letter

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

Good day,

My name is Carli Jade Myers and I am conducting research for the purposes of obtaining a Masters Degree in Organisational Psychology at the University of the Witwatersrand. As part of this degree I am required to complete a research project and present a thesis on the information obtained. The more responses I receive, the greater the strength of my research. My research aims to investigate the nature of the relationships between self-reported individual innovative behaviour, individual thinking styles, organisational climate for innovation, and quality of leader-member exchange.

Participation in this research will involve employees in your organisation (whose line of work falls within the range of management, product development and/or design, consulting, strategising, advertising, or marketing (in any field)) being asked to complete the attached questionnaire. The questionnaire will take approximately 25-30 minutes to complete. **Please note that employee participation will be completely voluntary and employees will not be advantaged or disadvantaged in any way should they choose to either complete or not complete the questionnaire.**

No identifying information, such as names or I.D. numbers will be requested. The completed questionnaire will not be seen by any person other than myself and my supervisor and the responses will only be looked at in relation to all other responses. As responses are anonymous it will not be possible to provide individual or organisational level feedback. There are no direct benefits or foreseeable risks for taking part in this study.

If employees choose to participate in this study, they will be asked to complete the attached questionnaire as carefully and honestly as possible in their free time. If you would specifically prefer employees not complete the questionnaire during work hours or using work facilities then please inform me and I will inform participants of this information. The questionnaire will be administered via an email link and submission of the online questionnaire will be regarded as informed consent to participate. If you would prefer that employees be provided with hard copies of the questionnaire instead of being approached electronically, then please inform me and I will arrange this. In this instance, questionnaires will be distributed and employees will be asked to return the completed questionnaires to a sealed box in a central location. Return of a completed questionnaire will be taken as informed consent to participate in the study. Feedback will be given in the form of a summary of the overall findings of the research and will be emailed to the organisation so that the organisation and participants may be informed of the overall results of the research as well as posted on a blog participants may access directly [http://workplaceinnovationresearch.blogspot.com]. Participants will also be provided with my contact details if they have any further questions or would like more information. In order to invite employees in your organisation to take part in this research, I am requesting your permission to conduct my study at your organisation and to have an email sent to employees to inform them of the study and request their participation.

This research will contribute to psychological knowledge and if you choose to allow this study to be conducted at your organisation with those employees who are willing to participate, it would be greatly appreciated. Should you have any question or concerns, please feel free to contact either me or my supervisor as per the details below.

Kind Regards

Carli Jade Myers
carlijademyers@gmail.com
_____

Supervisor: Nicky Israel
Nicky.Israel@wits.ac.za
_____

Appendix B: Electronic Participant Information Sheet

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

Good day,

My name is Carli Jade Myers and I am conducting research for the purposes of obtaining a Masters Degree in Organisational Psychology at the University of the Witwatersrand. As part of this degree I am required to complete a research project and present a thesis on the information obtained. The more responses I receive, the greater the strength of my research. My research considers the nature of the relationships between individual innovative behaviour, individual thinking styles, organisational climate for innovation and quality of leader-member exchange.

I would like to invite you to take part in my research however please note that in order to participate, you need to meet the following requirements: **you need to be an employee in an organisation between the ages of 18 and 65 and your line of work must involve one of the following: management, product development and/or design, consulting, strategising, advertising, or marketing (in any field)**. If you meet these criteria and are willing, participation in this research will involve you completing the attached questionnaire. The questionnaire will take approximately 25-30 minutes to complete. **Please note that your participation is completely voluntary and you will not be advantaged or disadvantaged in any way for choosing to complete or to not complete the questionnaire.**

No identifying information, such as your name or I.D. number is asked for and no-one at your organisation will be aware of whether you choose to participate or not**.** You will therefore remain anonymous and the data you provide will not be linked to you as an individual in any way. Your completed questionnaire will not be seen by any other person and will only be processed by myself and my supervisor; and your responses will only be looked at in relation to all other responses in the study. There are no direct benefits or foreseeable risks to taking part in this study.

If you choose to participate in the study, please complete the questionnaire as carefully and honestly as possible. The questionnaire can be accessed by clicking on the link in this email. Once you have answered the questions, please submit the online questionnaire. Once you have submitted your questionnaire, your identity will not be linked to your responses and thus your anonymity will be ensured. If you do submit your questionnaire, this will be considered as informed consent to participate in the study. The online questionnaire will remain open for completion until [insert date].

Please note that as the study is anonymous, it is not possible to give individual feedback. Feedback of the general results will be given in the form of a summary of the overall findings of the research. This summary will be emailed to the organisation and can be distributed accordingly (via email or posted on the organisation's notice board); it will also be posted on a blog [http://workplaceinnovationresearch.blogspot.com] where you will be able to access it once the research is complete. If you have any questions or concerns, please feel free to contact me or my supervisor as per the details below.

This research will contribute to psychological knowledge and if you choose to complete the questionnaire, your participation in this study would be greatly appreciated.

Kind Regards

Carli Jade Myers
carlijademyers@gmail.com

Supervisor: Nicky Israel
Nicky.Israel@wits.ac.za

Appendix C: Hardcopy Participant Information Sheet

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

Good day,

My name is Carli Jade Myers and I am conducting research for the purposes of obtaining a Masters Degree in Organisational Psychology at the University of the Witwatersrand. As part of this degree I am required to complete a research project and present a thesis on the information obtained. The more responses I receive, the greater the strength of my research. My research considers the nature of the relationships between individual innovative behaviour, individual thinking styles, organisational climate for innovation and quality of leader-member exchange.

I would like to invite you to take part in my research however please note that in order to participate, you need to meet the following requirements: **you need to be an employee in an organisation between the ages of 18 and 65 and your line of work must involve one of the following: management, product development and/or design, consulting, strategising, advertising, or marketing (in any field)**. If you meet these criteria and are willing, participation in this research will involve you completing the attached questionnaire. The questionnaire will take approximately 25-30 minutes to complete. **Please note that your participation is completely voluntary and you will not be advantaged or disadvantaged in any way for choosing to complete or to not complete the questionnaire.**

No identifying information, such as your name or I.D. number is asked for and no-one at your organisation will be aware of whether you choose to participate or not**.** You will therefore remain anonymous and the data you provide will not be linked to you as an individual in any way. Your completed questionnaire will not be seen by any other person and will only be processed by myself and my supervisor; and your responses will only be looked at in relation to all other responses in the study. There are no direct benefits or foreseeable risks to taking part in this study.

If you choose to participate in the study, please complete the attached questionnaire as carefully and honestly as possible. Once you have answered the questions, please place the completed hardcopy questionnaire in the box labelled "Carli Jade Myers Research: Completed Questionnaires", which will be placed in [central location to be confirmed]. This will ensure your anonymity. If you do return your questionnaire, this will be considered as informed consent to participate in the study. Please complete the hardcopy questionnaire and place it in the sealed box by no later than [insert date].

Please note that as the study is anonymous, it is not possible to give individual feedback. Feedback of the general results will be given in the form of a summary of the overall findings of the research. This summary will be emailed to the organisation and can be distributed accordingly (via email or posted on the organisation's notice board); it will also be posted on a blog [http://workplaceinnovationresearch.blogspot.com] where you will be able to access it once the research is complete. If you have any questions or concerns, please feel free to contact me or my supervisor as per the details below.

This research will contribute to psychological knowledge and if you choose to complete the questionnaire, your participation in this study would be greatly appreciated.

Kind Regards

Carli Jade Myers
carlijademyers@gmail.com

Supervisor: Nicky Israel
Nicky.Israel@wits.ac.za

Appendix D: Self-Developed Demographic Questionnaire

Gender	Male			Female			
Age							
Race	Black	White	Coloured	Indian	Other_____		
Education level	Matric	Diploma	Bachelors Degree	Honours Degree	Masters Degree	Doctorate Degree	Other _____

Field of work/ industry (e.g. commerce, manufacturing, marketing, financial etc...) _____

Type of job (e.g. job title – manager, product developer / designer, consultant, advertiser) _____

How long have you been working at your current organisation? _____

How long have you been working in your current position? _____

How many people work in your department / team? _____

Appendix E: Self Report Measure of Individual Innovative Behaviour

Please complete the following questionnaire by placing a cross or selecting the appropriate option.

In your current job, how often do you:	Never	Almost never	Some times	Fairly often	Very often	Always
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 market place?	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
Additional self-developed items:						
15. To what extent does the type of work you do allow you to engage in innovative behaviour?	1	2	3	4	5	6
16. To what extent does the type of work you do encourage you to engage in innovative behaviour?	1	2	3	4	5	6
17. To what extent is innovative behaviour important in your field of work?	1	2	3	4	5	6
18. To what extent is innovative behaviour desirable in your field of work?	1	2	3	4	5	6

Appendix F: Leader Member Exchange

This questionnaire contains items that ask you to describe your relationship with your leader (direct boss or manager). For each of the items, indicate the degree to which you think the item is true for you by circling one of the responses that appear below the item.

1. Do you know where you stand with your leader and do you usually know how satisfied your leader is with what you do?	Rarely 1	Occasionally 2	Sometimes 3	Fairly often 4	Very often 5
2. How well does your leader understand your job problems and needs?	Not a bit 1	A little 2	A fair amount 3	Quite a bit 4	A great deal 5
3. How well does your leader recognise your potential?	Not at all 1	A little 2	Moderately 3	Mostly 4	Fully 5
4. Regardless of the amount of formal authority your leader has built into his or her position, what are the chances that your leader would use his or her power to help you solve problems in your work?	None 1	Small 2	Moderate 3	High 4	Very high 5
5. Again, regardless of the amount of formal authority your leader has, what are the chances that he or she would "bail you out" at his or her expense?	None 1	Small 2	Moderate 3	High 4	Very high 5
6. I have enough confidence in my leader that I would defend and justify his or her decision if he or she were not present to do so.	Strongly disagree 1	Disagree 2	Neutral 3	Agree 4	Strongly agree 5
7. How would you characterize your working relationship with your leader?	Extremely ineffective 1	Worse than average 2	Average 3	Better than average 4	Extremely effective 5

Appendix G: Climate for Innovation Measure

Please complete the following questionnaire by placing a cross or selecting the appropriate option. All questions refer to your company or organisation.

Within my organisation:	Strongly disagree				Strongly agree
1. Creativity is encouraged here.	1	2	3	4	5
2. Our ability to function creatively is respected by the leadership.	1	2	3	4	5
3. Around here, people are allowed to try to solve the same problems in different ways.	1	2	3	4	5
4. The main function of members in this organization is to follow orders which come down through channels.	1	2	3	4	5
5. Around here, a person can get in a lot of trouble by being different.	1	2	3	4	5
6. This organization can be described as flexible and continually adapting to change.	1	2	3	4	5
7. A person can't do things that are too different around here without provoking anger.	1	2	3	4	5
8. The best way to get along in this organization is to think the way the rest of the group does.	1	2	3	4	5
9. People around here are expected to deal with problems in the same way.	1	2	3	4	5
10. This organization is open and responsive to change.	1	2	3	4	5
11. The people in charge around here usually get credit for others' ideas.	1	2	3	4	5
12. In this organization, we tend to stick to tried and true ways.	1	2	3	4	5
13. This place seems to be more concerned with the status quo than with change.	1	2	3	4	5
14. Assistance in developing new ideas is readily available.	1	2	3	4	5
15. There are adequate resources devoted to innovation in this organization.	1	2	3	4	5
16. There is adequate time available to pursue creative ideas here.	1	2	3	4	5
17. Lack of funding to investigate creative ideas is a problem in this organization.	1	2	3	4	5
18. Personnel shortages inhibit innovation in this organization.	1	2	3	4	5
19. This organization gives me free time to pursue creative ideas during the workday.	1	2	3	4	5
20. The reward system here encourages innovation.	1	2	3	4	5
21. This organization publicly recognizes those who are innovative.	1	2	3	4	5
22. The reward system here benefits mainly those who don't rock the boat	1	2	3	4	5

Appendix H: Thinking Style Inventory

Please complete the following questionnaire by placing a cross or selecting the appropriate option.

	Not at All Well	Not Very Well	Slightly Well	Some what Well	Well	Very Well	Extremely Well
1. When discussing or writing down ideas, I like criticizing others' ways of doing things	1	2	3	4	5	6	7
2. I prefer to deal with specific problems rather than with general questions	1	2	3	4	5	6	7
3. I enjoy working on projects that allow me to try novel ways of doing things	1	2	3	4	5	6	7
4. When making decisions, I tend to rely on my own ideas and ways of doing things	1	2	3	4	5	6	7
5. When discussing or writing down ideas, I follow formal rules of presentation	1	2	3	4	5	6	7
6. When talking or writing about ideas, I stick to one main idea	1	2	3	4	5	6	7
7. When starting a task, I like to brainstorm ideas with friends or peers	1	2	3	4	5	6	7
8. I tend to base my decisions only on concerns important to my group or peers	1	2	3	4	5	6	7
9. When making a decision, I like to compare the opposing points of view	1	2	3	4	5	6	7
10. I like to set priorities for the things I need to do before I start doing them	1	2	3	4	5	6	7
11. I like situations or tasks in which I am not concerned with details	1	2	3	4	5	6	7
12. When faced with a problem, I use my own ideas or strategies to solve it	1	2	3	4	5	6	7
13. In discussing or writing on a topic, I think the details and facts are more important than the overall picture	1	2	3	4	5	6	7
14. I tend to pay little attention to details	1	2	3	4	5	6	7
15. I like to figure out how to solve a problem following certain rules	1	2	3	4	5	6	7
16. I prefer tasks dealing with a single, concrete problem rather than general or multiple ones	1	2	3	4	5	6	7
17. I like to control all phases of a project, without having to consult with others	1	2	3	4	5	6	7
18. I enjoy working on different tasks that are important to my peer group	1	2	3	4	5	6	7
19. I like situations where I can try new ways of doing things	1	2	3	4	5	6	7
20. I like to do things in ways which have been used in the past	1	2	3	4	5	6	7
21. I like to play with my ideas and see how far they go	1	2	3	4	5	6	7
22. I am careful to use the proper method to solve any problem	1	2	3	4	5	6	7
23. I like to deal with major issues or themes, rather than details or facts	1	2	3	4	5	6	7

	Not at All Well	Not Very Well	Slightly Well	Some what Well	Well	Very Well	Extremely Well
24. I enjoy working on things that I can do by following directions	1	2	3	4	5	6	7
25. I like projects that allow me to look at a situation from a new perspective	1	2	3	4	5	6	7
26. In talking or writing down ideas, I like to have the issues organized in order of importance	1	2	3	4	5	6	7
27. I stick to standard rules or ways of doing things	1	2	3	4	5	6	7
28. I prefer to read reports for information I need, rather than ask others for it	1	2	3	4	5	6	7
29. When I have many things to do, I do whatever occurs to me first	1	2	3	4	5	6	7
30. I like to memorise facts and bits of information without any particular context	1	2	3	4	5	6	7
31. Before starting a project, I like to know the things I have to do and in what order	1	2	3	4	5	6	7
32. I like problems where I can try my own way of solving them	1	2	3	4	5	6	7
33. When trying to make a decision, I rely on my own judgement of the situation	1	2	3	4	5	6	7
34. I can switch from one task to another easily, because all tasks seem to me to be equally important	1	2	3	4	5	6	7
35. If I need more information, I prefer to talk about it with others rather than to read reports on it	1	2	3	4	5	6	7
36. In a discussion or report, I like to combine my own ideas with those of others	1	2	3	4	5	6	7
37. In trying to finish a task, I tend to ignore problems that come up	1	2	3	4	5	6	7
38. When faced with opposing ideas, I like to decide which is the right way to do something	1	2	3	4	5	6	7
39. I care more about the general effect than about the details of a task I have to do	1	2	3	4	5	6	7
40. When working on a task, I can see how the parts relate to the overall goal of the task	1	2	3	4	5	6	7
41. I like situations where I can compare and rate different ways of doing things	1	2	3	4	5	6	7
42. When there are many important things to do, I try to do as many as I can in whatever time I have	1	2	3	4	5	6	7
43. When faced with a problem, I like to work it out by myself	1	2	3	4	5	6	7
44. I tend to break down a problem into many smaller ones that I can solve, without looking at the problem as a whole	1	2	3	4	5	6	7
45. When I'm in charge of something, I like to follow methods and ideas used in the past	1	2	3	4	5	6	7
46. When faced with a problem, I make sure my way of doing it is approved by my peers	1	2	3	4	5	6	7
47. I use any means to reach my goal	1	2	3	4	5	6	7

	Not at All Well	Not Very Well	Slightly Well	Some what Well	Well	Very Well	Extremely Well
48. I like to check and rate opposing points of view or conflicting ideas	1	2	3	4	5	6	7
49. I like to collect detailed or specific information for projects on which I work	1	2	3	4	5	6	7
50. In dealing with difficulties, I have a good sense of how important each of them is and in what order to tackle them	1	2	3	4	5	6	7
51. I like situations where I can follow a set routine	1	2	3	4	5	6	7
52. When discussing or writing about a topic, I stick to points of view accepted by my peers	1	2	3	4	5	6	7
53. I like tasks and problems that have fixed rules to follow in order to complete them	1	2	3	4	5	6	7
54. I prefer to work on a project or task that is acceptable to and approved by my peers	1	2	3	4	5	6	7
55. I like situations where the role I play is a traditional one	1	2	3	4	5	6	7
56. When there are several important things to do, I do those most important to me and my peers	1	2	3	4	5	6	7
57. When discussing or writing down ideas, I stress the main idea and how everything fits together	1	2	3	4	5	6	7
58. I like projects that have a clear structure and a set plan and goal	1	2	3	4	5	6	7
59. When working on a task, I like to start with my own ideas	1	2	3	4	5	6	7
60. When there are many things to do, I have a clear sense of the order in which to do them	1	2	3	4	5	6	7
61. I like to participate in activities where I can interact with others as part of a team	1	2	3	4	5	6	7
62. Before starting a task or project, I check to see what method or procedure should be used	1	2	3	4	5	6	7
63. In doing a task, I like to see how what I do fits into the general picture	1	2	3	4	5	6	7
64. I like to tackle all kinds of problems, even seemingly trivial ones	1	2	3	4	5	6	7
65. Before starting a task, I like to figure out for myself how I will do my work	1	2	3	4	5	6	7
66. When faced with a problem, I like to solve it in a traditional way	1	2	3	4	5	6	7
67. I like to work alone on a task or a problem	1	2	3	4	5	6	7
68. I tend to emphasise the general aspect of issues or the overall effect of a project	1	2	3	4	5	6	7
69. I like to follow definite rules or directions when solving a problem or doing a task	1	2	3	4	5	6	7
70. When discussing or writing down ideas, I use whatever comes to mind	1	2	3	4	5	6	7
71. When working on a project, I like to share ideas and get input from other people	1	2	3	4	5	6	7
72. I feel happier about a job when I can decide for myself what and how to do it	1	2	3	4	5	6	7

	Not at All Well	Not Very Well	Slightly Well	Some what Well	Well	Very Well	Extremely Well
73. I like projects where I can study and rate different views or ideas	1	2	3	4	5	6	7
74. I like situations in which my role or the way I participate is clearly defined	1	2	3	4	5	6	7
75. When trying to make a decision, I tend to see only one major factor	1	2	3	4	5	6	7
76. I like problems where I need to pay attention to details	1	2	3	4	5	6	7
77. I like projects in which I can work together with others	1	2	3	4	5	6	7
78. I like situations where I can focus on general issues rather than on specifics	1	2	3	4	5	6	7
79. I dislike problems that arise when doing something in the usual, customary way	1	2	3	4	5	6	7
80. I like to challenge old ideas or ways of doing things and to seek better ones	1	2	3	4	5	6	7
81. When discussing or writing down ideas, I only like to use my own ideas	1	2	3	4	5	6	7
82. I like situations where I interact with others and everyone works together	1	2	3	4	5	6	7
83. I find that solving one problem usually leads to many other ones that are just as important	1	2	3	4	5	6	7
84. When making a decision, I try to take the opinions of others into account	1	2	3	4	5	6	7
85. I like working on projects that deal with general issues and not with nitty-gritty details	1	2	3	4	5	6	7
86. I like situations where I can use my own ideas and ways of doing things	1	2	3	4	5	6	7
87. If there are several important things to do, I do the ones most important to me	1	2	3	4	5	6	7
88. I like to take old problems and find new methods to solve them	1	2	3	4	5	6	7
89. I prefer tasks or problems where I can grade the designs or methods of others	1	2	3	4	5	6	7
90. When there are several important things to do, I pick the ones most important to my peer group	1	2	3	4	5	6	7
91. When faced with a problem, I prefer to try new strategies or methods to solve it	1	2	3	4	5	6	7
92. I like to concentrate on one task at a time	1	2	3	4	5	6	7
93. I like projects that I can complete independently	1	2	3	4	5	6	7
94. When trying to make a decision, I try to take all points of view into account	1	2	3	4	5	6	7
95. When starting something, I like to make a list of things to do and to order things by importance	1	2	3	4	5	6	7
96. I enjoy work that involves analyzing, grading, or comparing things	1	2	3	4	5	6	7
97. I like to do things in new ways not used by others in the past	1	2	3	4	5	6	7
98. When I start a task or project, I focus on the parts most relevant to my peer group	1	2	3	4	5	6	7

	Not at All Well	Not Very Well	Slightly Well	Some what Well	Well	Very Well	Extremely Well
99. I have to finish one project before starting another one	1	2	3	4	5	6	7
100. In talking or writing down ideas, I like to show the scope and context of my ideas, that is, the general picture	1	2	3	4	5	6	7
101. I pay more attention to parts of a task than to its overall effect or significance	1	2	3	4	5	6	7
102. I prefer situations where I can carry out my own ideas without relying on others	1	2	3	4	5	6	7
103. I like to change routines in order to improve the way tasks are done	1	2	3	4	5	6	7
104. When I start on a task, I like to consider all possible ways of doing it, even the most ridiculous	1	2	3	4	5	6	7

Appendix I: Ethics Clearance Certificate

UNIVERSITY OF THE WITWATERSRAND, JOHANNESBURG

HUMAN RESEARCH ETHICS COMMITTEE (SCHOOL OF HUMAN & COMMUNITY DEVELOPMENT

CLEARANCE CERTIFICATE	**PROTOCOL NUMBER: MORG/14/014 III**
PROJECT TITLE:	Self-reported Individual Innovative Behaviour, Individual Thinking Style, Organisational climate for Innovation, and Leader-member exchange.
INVESTIGATORS	Myers Carli
DEPARTMENT	Psychology
DATE CONSIDERED	05/05/13
DECISION OF COMMITTEE*	Approved

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

DATE: 19 June 2014

CHAIRPERSON
(Professor M. Nduna)

cc Supervisor:

Ms. N Israel
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 2016

PLEASE QUOTE THE PROTOCOL NUMBER IN ALL ENQUIRIES

Appendix J: Tables of Sample Characteristics

Table 1

Gender of participants

Gender	Frequency	Percentage
Male	130	49.1%
Female	134	50.6%
Total	264	99.6%

*Frequency Missing = 1 (0.4%)

Table 2

Age of participants

Variable	Mean	Standard deviation	Minimum	Maximum	N
Age	34.02	8.851	22	62	254

*Frequency Missing = 11 (4.1%)

Table 3

Race of participants

Race	Frequency	Percentage
Black	72	27.2%
White	149	56.2%
Coloured	24	9.1%
Indian	16	6%
Total	261	98.5%

*Frequency Missing = 4 (1.5%)

Table 4

Education level of participants

Education Level	Frequency	Percentage
Matric	50	18.9%
Diploma	82	30.9%
Bachelors Degree	45	17.0%
Honours Degree	45	17.0%
Masters Degree	33	12.5%
Doctorate Degree	3	1.1%
Total	258	97.4%

*Frequency Missing = 7 (2.6%)

Table 5

Occupational Industry of Participants

Occupational Industry	Frequency	Percentage
Retail, Customer Service	17	6.4%
Advertising, Journalism, Media	19	7.2%
Marketing, Sales, Distribution	23	8.7%
Banking, Finance, Commerce	87	32.8%
Construction, Engineering, Property	9	3.4%
Information Technology	18	6.8%
Consultancy, Recruitment, Training, Psychological Services	27	10.2%
Telecommunications	3	1.1%

Research	2	0.8%
Manufacturing	6	2.3%
Education	8	3.0%
Administration	2	0.8%
Pharmaceutical, Social Work, Health	5	1.9%
Governmental, Customs	3	1.1%
Legal	3	1.1%
Petroleum, Fuels	2	0.8%
Logistics	2	0.8%
Aviation	2	0.8%
Service Industry, Service Delivery	4	1.5%
Utility	1	0.4%
Parastatal	1	0.4%
Environmental Sciences, Marine	2	0.8%
Executive Search	1	0.4%
Compliance	1	0.4%
Hospitality	2	0.8%
Food Science, Fitness Industry	3	1.2%
Social Studies	1	0.4%
Total	254	95.8%

*Frequency Missing = 11 (4.2%)

Table 6

Job of participants

Job	Frequency	Percentage
Position of authority (for example, CEO, supervisor, owner, director)	125	47.2%
Consultants or Development Specialists (for example, product specialists, recruitment, business development)	31	11.7%
Administration	19	7.2%
Researcher	3	1.1%
Intern	3	1.1%
Analyst, Strategist, Logistics	11	4.2%
Attorney	2	0.8%
Agent	2	0.8%
Accountant, Financial Advisor	6	2.3%
Graphic Designer	2	0.8%
Human Resource	5	1.9%
Product development, Design / Editing	15	5.7%
Marketing, Publicist, Sales	5	1.9%
Engineer	3	1.1%
Technician	2	0.8%
Nurse	2	0.8%
Senior Environmental Advisor	1	0.4%
Receiving Clerk	1	0.4%
Client Advisor	1	0.4%

Assistant (personal, executive)	3	1.1%
Quality Assurance	2	0.8%
Operational Risk	1	0.4%
Clerk	1	0.4%
Support Counsellor	1	0.4%
Economist	1	0.4%
Private Banker	1	0.4%
Bar Tender	1	0.4%
Club V Max Coach	1	0.4%
Tendering	1	0.4%
Liaison Officer	2	0.8%
Coordinator Guide	1	0.4%
Inspection	1	0.4%
Teller	1	0.4%
Food Safety Coordinator	1	0.4%
IT Support Officer, Operations	2	0.8%
Warehouse Planner Supervisor	1	0.4%
Total	261	98.5%

*Frequency Missing = 4 (1.5%)

Appendix K: Additional Tables

Table 10

Levels of the self-reported individual innovative behaviour frequencies scale

Item from scale	Never	Almost	Some-times	Fairly Often	Very Often	Always	Total	Missing
19. Look for opportunities to improve what exists	1 (0.4%)	6 (2.3%)	31 (11.7%)	54 (20.4%)	93 (35.1%)	80 (30.2%)	265 (100%)	0 (0%)
20. Recognise opportunities to make a positive difference	1 (0.4%)	4 (1.5%)	23 (8.7%)	63 (23.8%)	104 (39.2%)	69 (26.0%)	264 (99.6%)	1 (0.4%)
21. Pay attention to non-routine issues	3 (1.1%)	3 (1.1%)	59 (22.3%)	89 (33.6%)	76 (28.7%)	35 (13.2%)	265 (100%)	0 (0%)
22. Generate ideas or solutions to address problems	2 (0.8%)	4 (1.5%)	20 (7.5%)	56 (21.1%)	116 (43.8%)	65 (24.5%)	263 (99.2%)	2 (0.8%)
23. Define problems more broadly to gain greater insight	3 (1.1%)	7 (2.6%)	38 (14.3%)	70 (26.4%)	94 (35.5%)	51 (19.2%)	263 (99.2%)	2 (0.8%)
24. Experiment with new ideas and solutions	2 (0.8%)	11 (4.2%)	43 (16.2%)	77 (29.1%)	85 (32.1%)	46 (17.4%)	264 (99.6%)	1 (0.4%)
25. Test out ideas or solutions to address unmet needs	3 (1.1%)	20 (7.5%)	49 (18.5%)	95 (35.8%)	63 (23.8%)	31 (11.7%)	261 (98.5%)	4 (1.5%)
26. Evaluate the strengths and weaknesses of new ideas	4 (1.5%)	16 (6.0%)	51 (19.2%)	82 (30.9%)	79 (29.8%)	33 (12.5%)	265 (100%)	0 (0%)
27. Try to persuade others of the importance of something new	2 (0.8%)	9 (3.4%)	46 (17.4%)	67 (25.3%)	91 (34.3%)	47 (17.7%)	262 (98.9%)	3 (1.1%)
28. Push ideas forward for implementation	3 (1.1%)	13 (4.9%)	46 (17.4%)	80 (30.2%)	84 (31.7%)	39 (14.7%)	265 (100%)	0 (0%)

29. Take the risk to support new ideas	3 (1.1%)	11 (4.2%)	51 (19.2%)	76 (28.7%)	86 (32.5%)	36 (13.6%)	263 (99.2%)	2 (0.8%)
30. Implement changes that seem to be beneficial	2 (0.8%)	12 (4.5%)	36 (13.6%)	74 (27.9%)	88 (33.2%)	52 (19.6%)	264 (99.6%)	1 (0.4%)
31. Work the bugs out of new approaches applied to what exists	9 (3.4%)	17 (6.4%)	45 (17.0%)	83 (31.3%)	78 (29.4%)	32 (12.1%)	264 (99.6%)	1 (0.4%)
32. Incorporate new ideas for improvement to what exists	4 (1.5%)	22 (8.3%)	48 (18.1%)	69 (26.0%)	90 (34.0%)	32 (12.1%)	265 (100%)	0 (0%)

Table 14

Relationships between the thirteen thinking styles

	Pearson's Correlation Coefficients						
	Liberal	**Conserv.**	**Legisl.**	**Exec.**	**Judic.**	**Monarc.**	**Hierarc.**
Conserv.	0.027						
	0.676						
	n = 243						
Legisl.	0.791	0.141					
	0.000	0.029					
	n = 243	n = 243					
Exec.	0.261	0.808	0.335				
	0.000	0.000	0.000				
	n = 243	n = 243	n = 243				
Judical.	0.717	0.334	0.650	0.530			
	0.000	0.000	0.000	0.000			
	n = 243	n = 243	n = 243	n = 243			
Monarc.	0.185	0.515	0.171	0.440	0.283		
	0.005	0.000	0.010	0.000	0.000		
	n = 227	n = 227	n = 227	n = 227	n = 227		
Hierarc.	0.414	0.421	0.397	0.614	0.599	0.319	
	0.000	0.000	0.000	0.000	0.000	0.000	
	n = 227	n = 227	n = 227	n = 227	n = 227	n = 227	
Oligarc.	0.104	0.672	0.080	0.627	0.347	0.468	0.491
	0.117	0.000	0.232	0.000	0.000	0.000	0.000
	n = 227	n = 227	n = 227	n = 227	n = 227	n = 227	n = 227
Anarc.	0.471	0.319	0.389	0.427	0.526	0.493	0.537
	0.000	0.000	0.000	0.000	0.000	0.000	0.000
	n = 227	n = 227	n = 227	n = 227	n = 227	n = 227	n = 227
Local	0.286	0.514	0.292	0.559	0.501	0.559	0.473
	0.000	0.000	0.000	0.000	0.000	0.000	0.000
	n = 219	n = 219	n = 219	n = 219	n = 219	n = 218	n = 218
Global	0.378	0.266	0.297	0.271	0.331	0.476	0.316
	0.000	0.000	0.000	0.000	0.000	0.000	0.000
	n = 219	n = 219	n = 219	n = 219	n = 219	n = 218	n = 218
Internal	0.280	0.306	0.396	0.252	0.294	0.542	0.237

	0.000	0.000	0.000	0.000	0.000	0.000	0.000
	n = 219	n = 219	n = 219	n = 219	n = 219	n = 218	n = 218
External	0.418	0.231	0.278	0.394	0.473	0.215	0.536
	0.000	0.001	0.000	0.000	0.000	0.001	0.000
	n = 219	n = 219	n = 219	n = 219	n = 219	n = 218	n = 218

	Oligarc.	**Anarc.**	**Local**	**Global**	**Internal**	**External**	
Oligarc.		0.455	0.493	0.342	0.189	0.442	
		0.000	0.000	0.000	0.005	0.000	
		n = 227	n = 218	n = 218	n = 218	n = 218	
Anarc.			0.520	0.437	0.427	0.456	
			0.000	0.000	0.000	0.000	
			n = 218	n = 218	n = 218	n = 218	
Local				0.280	0.542	0.298	
				0.000	0.000	0.000	
				n = 219	n = 219	n = 219	
Global					0.304	0.427	
					0.000	0.000	
					n = 219	n = 219	
Internal						-0.111	
						0.103	
						n = 219	

Table 15

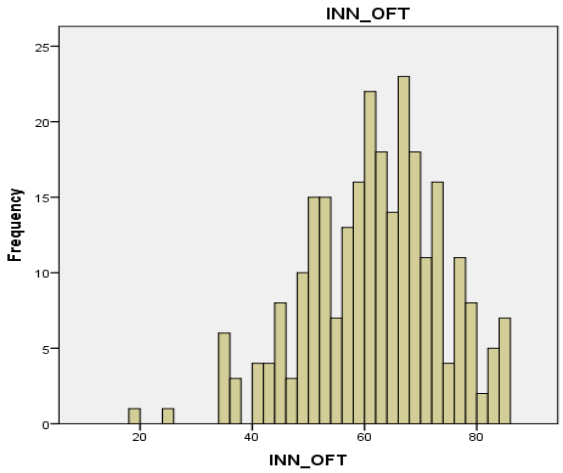
Relationship between organisational support, organisational resources, LMX, and the thinking styles

	Pearson's Correlation Coefficients		
	Organisational Support	**Organisational Resources**	**LMX**
Organisational Resources	0.582 0.000 n = 256		
LMX	0.523 0.000 n = 265	0.283 0.000 n = 265	
Liberal	0.046 0.473 n = 243	0.070 0.279 n = 243	0.074 0.251 n = 243
Conservative	-0.090 0.163 n = 243	0.100 0.120 n = 243	0.021 0.745 n = 243
Legislative	-0.012 0.851 n = 243	0.009 0.889 n = 243	0.036 0.574 n = 243
Executive	-0.082 0.201 n = 243	0.133 0.038 n = 243	0.017 0.719 n = 243
Judicial	-0.021 0.739 n = 243	0.084 0.190 n = 243	0.038 0.552 n = 243
Monarchic	-0.119 0.073 n = 227	0.044 0.512 n = 227	-0.071 0.285 n = 227
Hierarchic	0.055 0.414 n = 227	0.200 0.002 n = 227	0.021 0.750 n = 227
Oligarchic	-0.070	0.157	0.001

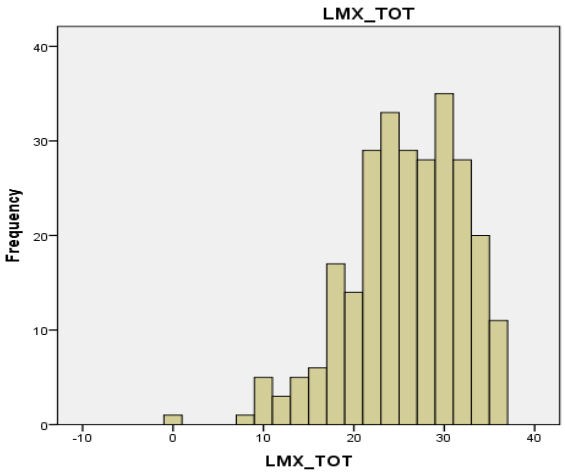
	0.291	0.018	0.988
	n = 227	n = 227	n = 227
Anarchic	-0.021	0.086	0.091
	0.757	0.198	0.717
	n = 227	n = 227	n = 227
Local	-0.085	0.079	-0.107
	0.209	0.243	0.115
	n = 219	n = 219	n = 219
Global	-0.090	-0.006	0.124
	0.184	0.926	0.066
	n = 219	n = 219	n = 219
Internal	-0.147	-0.074	-0.045
	0.029	0.274	0.507
	n = 219	n = 219	n = 219
External	0.033	0.160	0.048
	0.625	0.018	0.477
	n = 219	n = 219	n = 219

Appendix L: Histograms

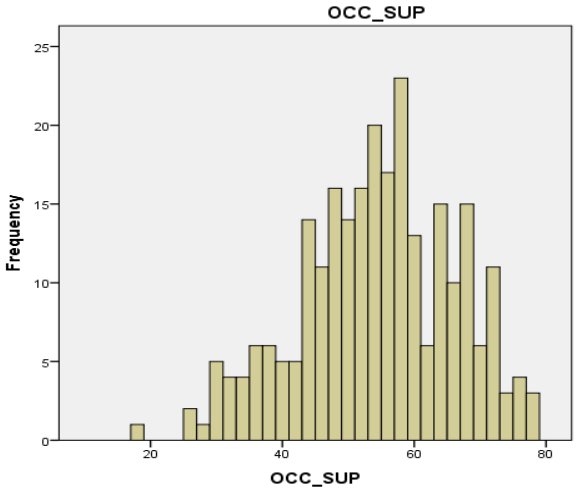
Distribution of self-reported individual innovative behaviour



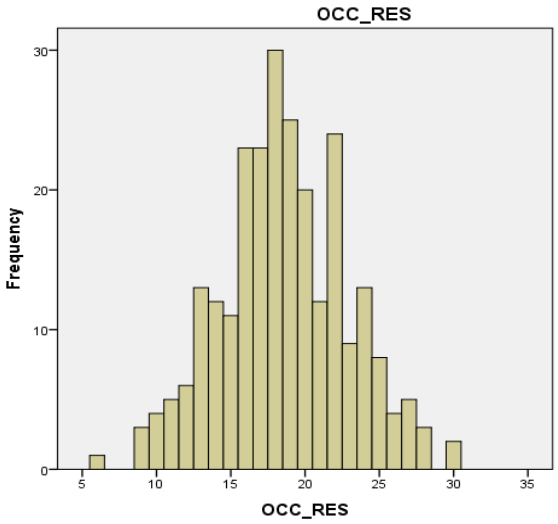
Distribution of leader-member exchange



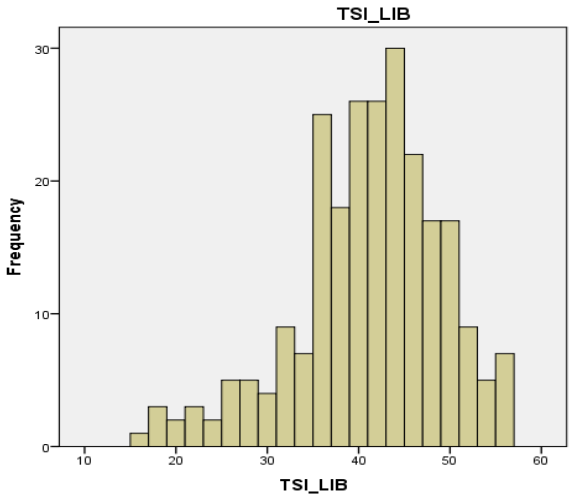
Distribution of organisational climate for innovation (organisational support)



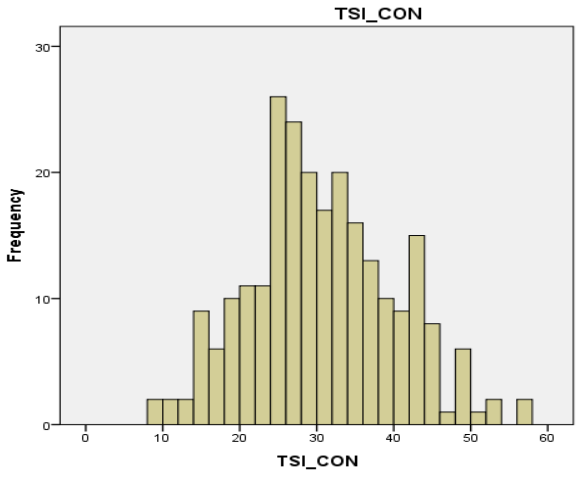
Distribution of organisational climate for innovation (organisational resources)



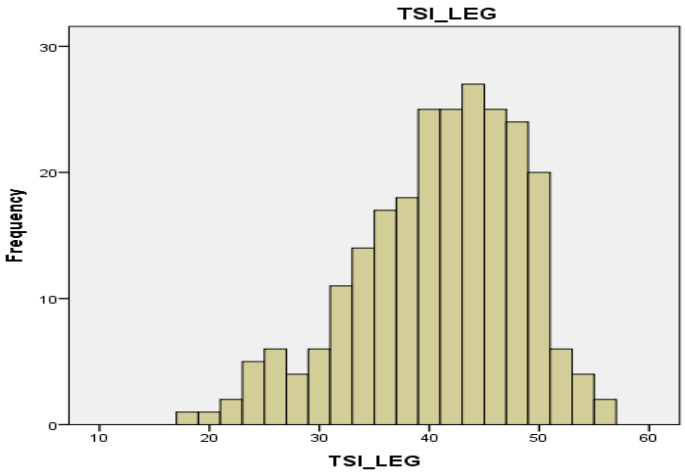
Distribution of individual thinking style (liberal)



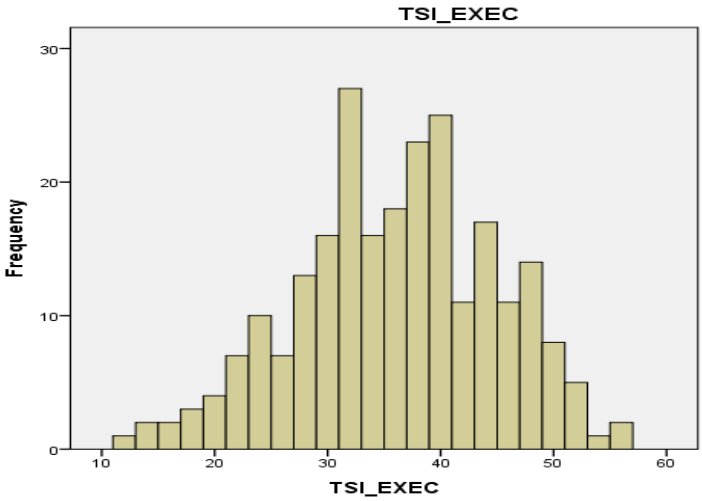
Distribution of individual thinking style (conservative)



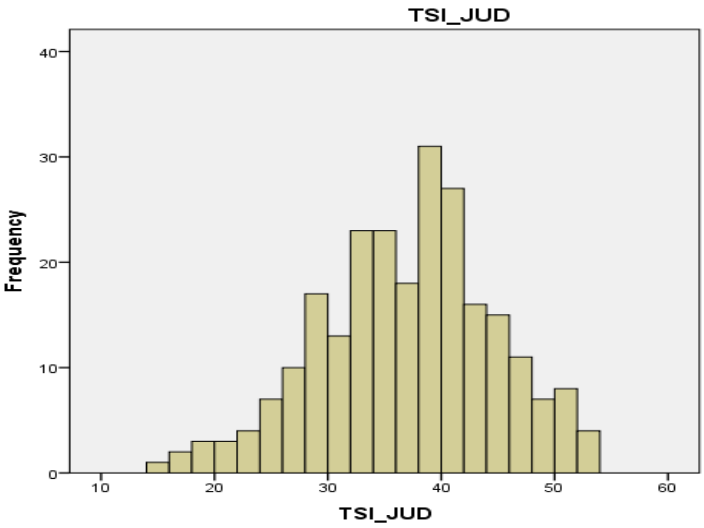
Distribution of individual thinking style (legislative)



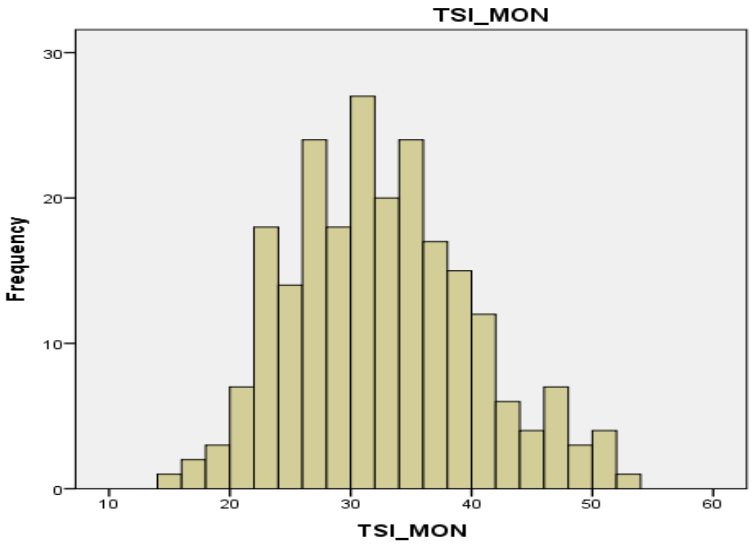
Distribution of individual thinking style (executive)



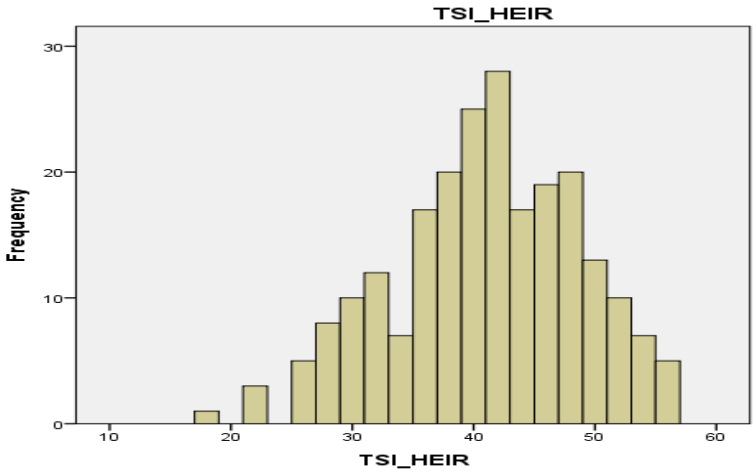
Distribution of individual thinking style (judicial)



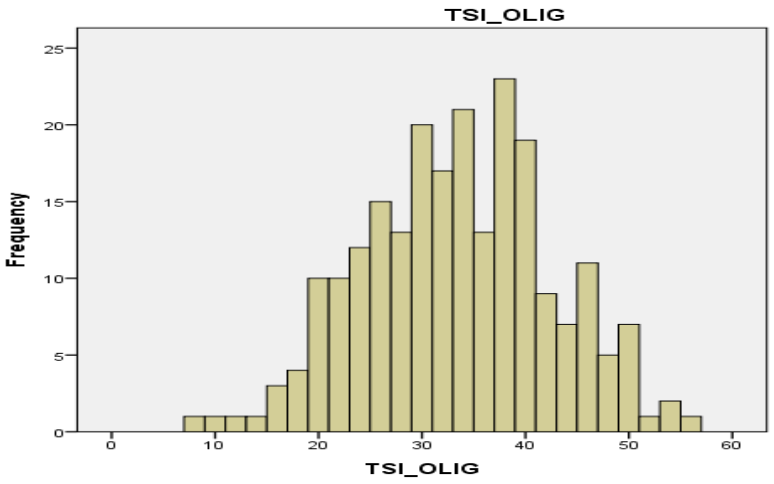
Distribution of individual thinking style (monarchic)



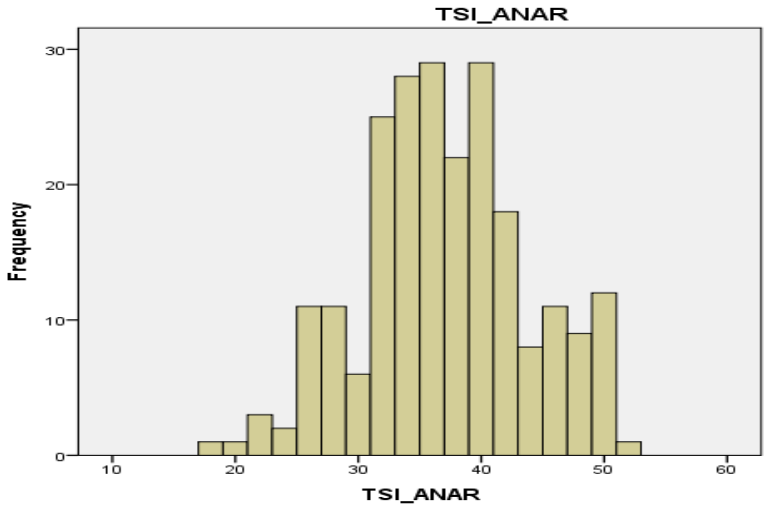
Distribution of individual thinking style (hierarchical)



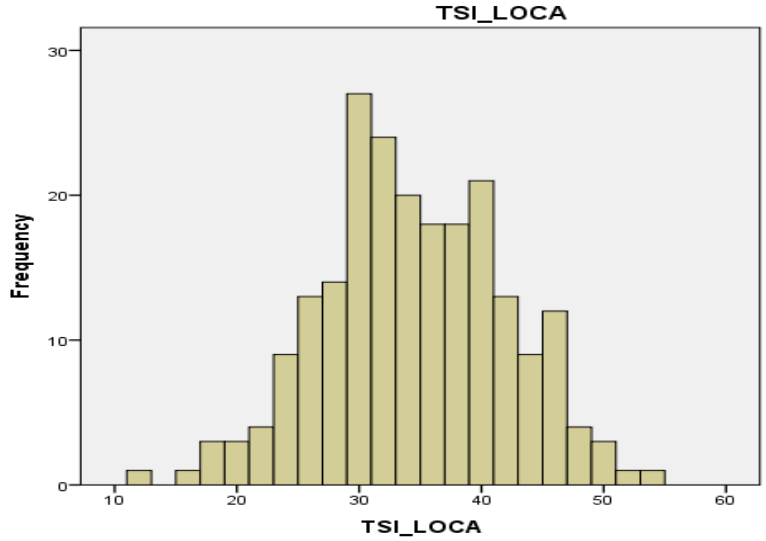
Distribution of individual thinking style (oligarchic)



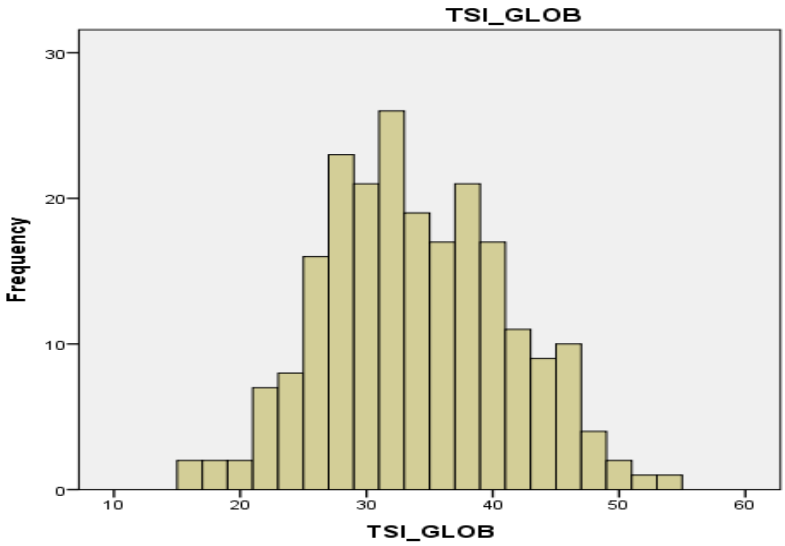
Distribution of individual thinking style (anarchic)



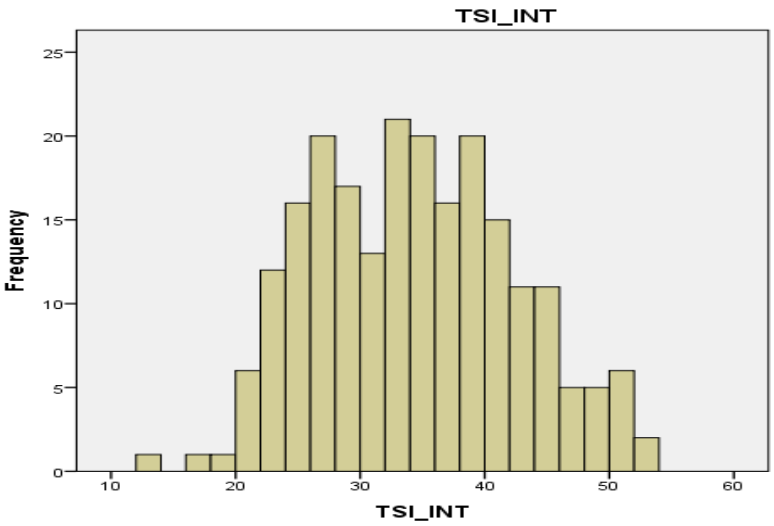
Distribution of individual thinking style (local)



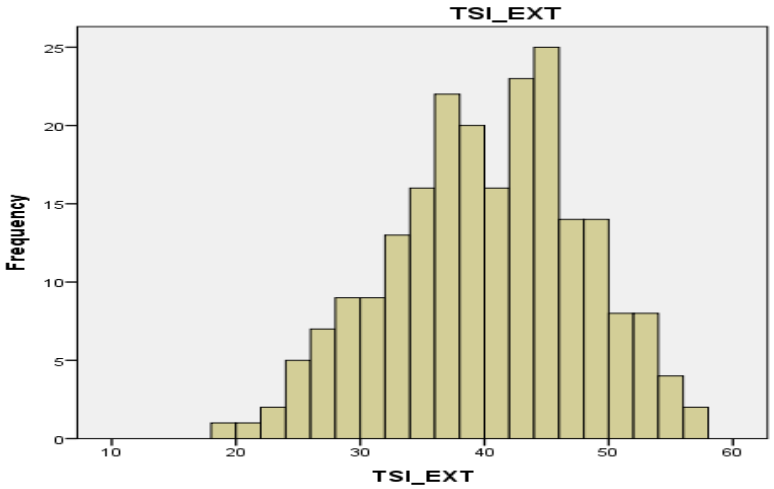
Distribution of individual thinking style (global)



Distribution of individual thinking style (internal)



Distribution of individual thinking style (external)



Appendix M: Figures

Figure 1: Diagrammatic representation of the componential model of creativity

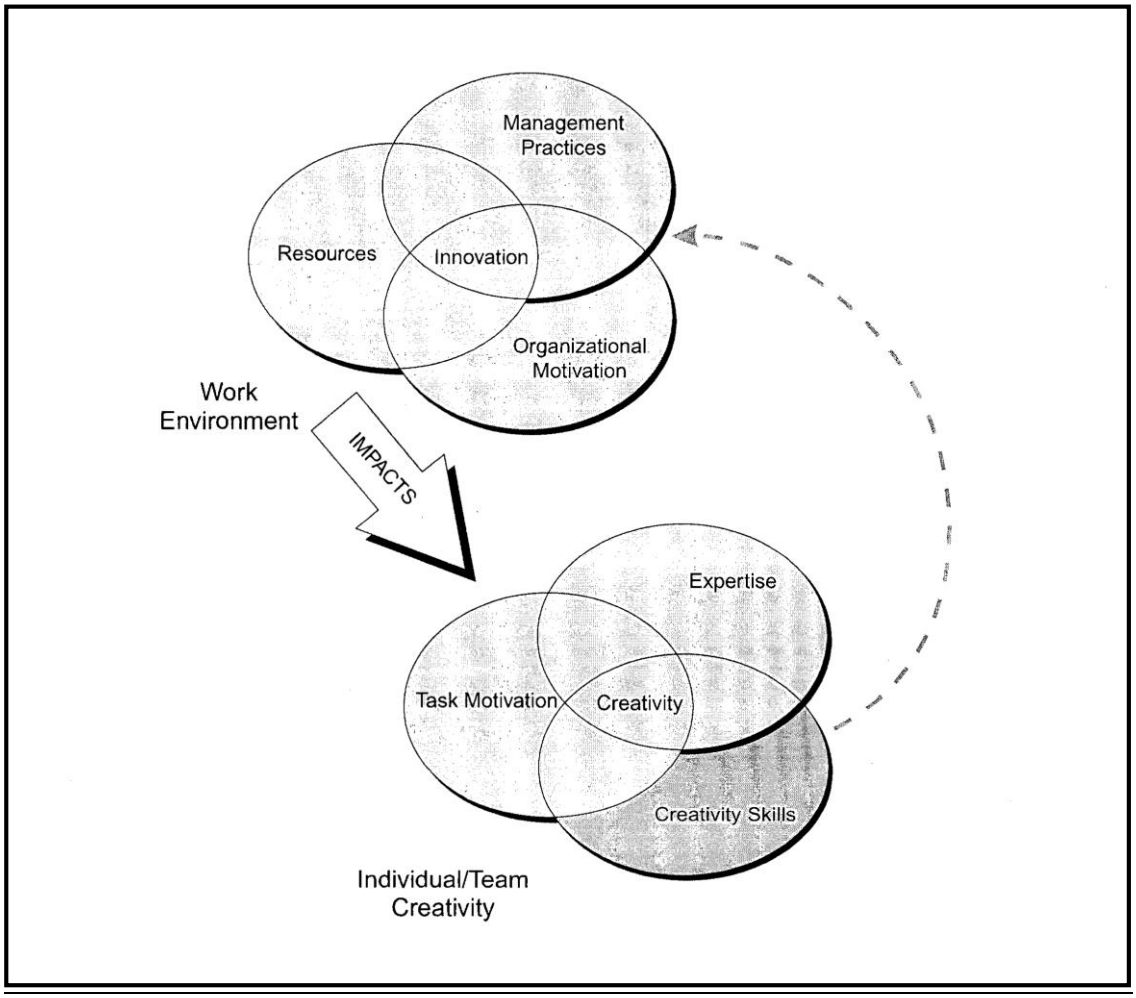


Table taken from Amabile (1996), p. 9.

Figure 2: Thinking Styles Categories and Explanations

FUNCTIONS	
Legislative style	The person prefers tasks requiring creative strategies.
Executive styles	The person is more concerned with the implementation of tasks with set guidelines.
Judicial style	The person focuses attention on evaluating the products of other's activities.
FORMS	
Monarchic style	The person prefers tasks that allow complete focus on one thing at a time.
Hierarchical style	The person prefers to distribute attention across several tasks that are prioritised.
Oligarchic style	The person prefers to work towards multiple objectives during the same period of time, but without setting clear priorities.
Anarchic style	The person prefers working on tasks that require no system at all.
LEVELS	
Local style	The person prefers tasks requiring working with details.
Global style	The person pays more attention to the overall picture regarding an issue and to abstract ideas.
SCOPE	
Internal style	The person prefers being engaged in tasks that allows working independently.
External style	The person prefers being engaged in tasks that provide opportunities for developing interpersonal relationships.
LEANINGS	
Liberal style	The person prefers novelty and ambiguity.
Conservative style	The person adheres to existing rules and procedures in performing tasks.

Table taken from Murphy (2009), p. 30.

16. STATEMENT OF PRINCIPLES FOR POSTGRADUATE

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

THE SUPERVISOR AND THE

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

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

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 :_____

Student's signature :_____

Name of Supervisor :_____

Supervisor's signature : _____

Name of Co-Supervisor :_____

Co-Supervisor's signature : _____

The broad area of study is : _____

_____

Provisional submission date is: _____

Degree : _____

School : _____

Faculty : _____

Date : _____

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, the appropriate Postgraduate Coordinators and Committees. There is, in addition, a University Grievance Policy to help guide deliberations. It is available on www.wits.ac.za/prospective/postgraduate.