Gordon Institute of Business Science
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The relationship between cognitive diversity, transformational leadership and team performance

Submitted by:

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Abstract

Diversity research is wide and supported with various outcomes and results. This research aimed to understand whether a deeper level diversity namely cognitive diversity is linked to specific performance outcomes in organisations. Business and academia understand the more common surface level demographic diversity well, as it is a topic which has been studied widely with mixed results. Transformational leadership was included in the study as it is a common leadership style included in diversity research because of its characteristics to inspire and motivate collectiveness in achieving organisational goals.

A quantitative study was performed operationalised using an online survey. The questions aimed to gain an understanding of the perceptions of professionals, middle and senior managers working corporates in South Africa on cognitive diversity, transformational leadership and performance outcomes in relation to their teams. Purposive and snowball sampling techniques were used in the study. Correlation and regression analysis were performed on data collected from 153 participants who met the population criteria. No relationship was found between cognitive diversity and team performance. However, a significant positive relationship was shown between transformational leadership and team performance.

Keywords: Cognitive diversity, diversity, team performance, leadership, transformational leadership.

Declaration

I declare that this research project is my own work. It is submitted in partial fulfilment of the requirements for the degree of Master of Business Administration at the Gordon Institute of Business Science, University of Pretoria. It has not been submitted before for any degree or examination in any other University. I further declare that I have obtained the necessary authorisation and consent to carry out this research.

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1. REVIEW OF THE TOPIC

1.1. Introduction

In the rapidly changing world of work, many managers are faced with the task of creating heterogenous teams in order to stimulate creativity and generate innovative and unique solutions to problems (Wang, Kim, & Lee, 2016). Currently there are many teams in businesses around the world that include individuals with similar functional and educational backgrounds. The more recent research on diversity shows that teams have more opportunity for creativity if the members of the team have high degrees or perceived levels of cognitive diversity (Wang et al., 2016). Having diverse teams with different knowledge, experiences and different sources of information can encourage creativity and innovation to solve emerging business problems is becoming a necessity in today's organisations (Chen, Liu, Zhang, & Kwan, 2019). This is because the rapid changes in the business environment of many industries have created increased competition, requiring companies to adapt to the changing environment to maintain profitability and other performance outcomes.

This provides the context for the research topic as well as the research problem and the objectives which this study, which is to provide additional insights into the existing body of literature on the topic. The relevance and motivation for this study is also discussed in terms of who the potential users of the research will be and how it can assist them in their work. The scope of the study is also described along with the structure and framework of this research report.

1.2. Background to the research topic

There is a generally accepted relationship between leadership diversity and firm performance. Hunt, Layton and Prince (2015) conducted a study which aimed to understand the relationship between leadership diversity and the financial performance the company. The study used the Herfindahl-Hirschman Index (HHI) to measure market competitiveness. The study concluded that where there is more leadership diversity, organisations show growth in financial returns.

Looked at in terms of the different dimensions of diversity, gender diversity in leadership (present in the top quartile of the study) was positively related to fifteen percent higher performance on average when compared to the company's industry. Similarly, where the leadership was more culturally and ethnically diverse (also present in the top quartile) returns were on average thirty-five percent higher than the industry average. Statistically, where the leadership was less diverse - both in terms of gender and ethnicity - companies were found to have less financial return than the average in their industry. The results of the study indicate that the more diverse a company is, the more it can attract top talent, improve their customer interactions, improve employee satisfaction and achieve better decision making - all of which will result in improved financial performance.

In addition to building diverse leadership structures, diversity should cascade down the organisation and be considered at an employee level. Dwyer, Richard and Chadwick (2003) suggest that organisations that have a growth strategy need to build the internal capability to achieve their goals and will require additional resources because initially operational inefficiencies will need to be catered for. They further argue that employees represent a valuable resource as they have the hands-on skills, knowledge and abilities to address operational inefficiencies. Finally, diversity in teams has performance-related benefits in terms of achieving team deliverables; diversity has a positive relationship with team reputation and is related to higher effectiveness in earning new business and maintaining client relationships (Tyran & Gibson, 2008).

A study on the relationships between certain types of organisational diversity (relating to internationalisation and inherent demography diversity) concluded that diversity had a positive association with knowledge-sharing behaviour (Lauring & Selmer, 2012). Another study concluded that the presence of diversity in a top management team promotes positive short term organisational performance (Boerner, Linkohr, & Kiefer, 2011).

As mentioned in the previous section, the importance of having a diverse workforce has numerous performance benefits. One of the key mechanisms used in business to ensure that the objectives are achieved for building a diverse workforce is the

employee recruitment and selection processes. The job interview process has been an important part of staff selection practices in organisations over the past 100 years. It is so embedded in hiring practices today that considering another selection method is rare if not unthinkable. Interviews are typically the primary - if not only – method used in selecting candidates for jobs, yet it has its shortcomings. It is prone to subjectivity, selection biases and ultimately discrimination (Derous, Buijsrogge, Roulin, & Duyck, 2016). These inherent biases in HR recruitment practices represent an important aspect of why this study on diversity, specifically a type of diversity that goes beyond surface level diversity, is necessary. It can highlight why diversity of staff is necessary for organisations and promote changes in the way organisations select and recruit individuals in order to overcome these shortcomings.

Much research is available on diversity as a broad construct leading to both favourable and unfavourable outcomes, however the conditions which make it work are not yet fully understood (Guillaume, Dawson, Otaye-Ebede, Woods, & West, 2017). This indicates the need for research on the necessary moderators of a diverse environment to enable improved outcomes. Further to this, research on specific types of diversity - which in this study is a focus on cognitive diversity leading to team performance outcomes - is also unknown because much of the research on cognitive diversity has been performed in relation to creativity and innovation outcomes (Wang et al., 2016).

1.3. Research problem and objectives

Business leaders and academics are unclear as to whether building teams comprising of individuals with differing cognitions leads to greater performance outcomes. This is the research problem of the study. The argument underpinning the research problem is that there are many teams within organisations that are comprised of individuals who are similar in cognition. It is particularly important in the current business landscape, which has become increasingly competitive due to the rapid change in technology and innovation. Business leaders need to constantly attend to new design and innovation and make it a part the daily activities of business (Murad & Lee, 2019). As seen in the introduction, relationships have been found between cognitively diverse teams and greater innovation and creativity (Wang et al., 2016). At the same time it is

critical for business to understand whether cognitive diversity is related specifically to performance outcomes as there is limited research on whether building teams with individuals who are cognitively diverse will result in greater organisational and team performance outcomes. Such research can provide useful insights into whether organisations should build cognitively diverse teams to achieve specific performance outcomes. Also mentioned in the introduction is the need for a greater understanding of the conditions that enable a diverse climate in organisations.

Guillaume et al. (2017) describe relationships in a hypothesised model for further research between a diverse climate in an organisation and three positive outcomes; performance, social integration and well-being. They further suggest that there are six moderators of a diverse climate in the organisation; strategy, HR practices, leadership, culture, unit design and individual differences. This model is discussed further in chapter two (section 2.2) and was used as a foundation to understand whether relationships could exist between cognitive diversity, team performance outcomes and the role of leadership - which is the objective of the research.

The research question of this study will be “Are there relationships among cognitive diversity, transformational leadership and team performance?” The research question will be studied as follows:

- Whether a relationship exists between cognitive diversity and team performance.
- Whether a relationship exists between transformational leadership and team performance
- Whether the relationship between cognitive diversity and team performance is moderated by transformational leadership.

Understanding these relationships will be beneficial to leaders in organisations when selecting staff for their teams who can promote higher levels of performance. It can also provide insights into how recruitment processes can be modified to include testing for certain cognitive diverse aspects in people.

1.4. Research relevance and motivation

The impact of team members' differences on team functioning has been a research topic that has interested researchers for decades and much research has been published - both qualitative and quantitative. However, in recent years there has been a trend towards the study of cognitive diversity; a deeper level type of diversity. This is a move away from surface diversity (the most common being demographic diversity) which is not relevant for task performance in the workplace This research is relevant across all industries, is multidisciplinary and is relevant across nationalities and as such can be used in any organisation in the world (Mello & Rentsch, 2015). Furthermore, this research is beneficial for leaders of teams in providing insights on selection of team members that can yield performance outcomes. It can also be used as a tool for recruitment of people into the organisation.

1.5. Research scope

Guillaume et al. (2017) set out to provide a comprehensive, qualitative model of all variables moderating a diversity mindset (climate) in the organisation with the intention of creating a diverse environment; 'social integration, performance and well-being', the focus being on elements within organisations within management control.

Given the above, the study will focus on professional, middle and senior manager groups in South Africa as the opinions of these groups will provide useful insights into the issues of building diverse teams to achieve specific performance outcomes. They are best positioned to assess whether cognitive diversity exists in their teams and have access to information on their team's performance. They are also most likely to be a part of multi-disciplinary teams where cognitive diversity is required to solve current business problems. As such, this study will be on professionals, middle and senior management across various industries in corporate South Africa.

1.6. Research structure

To answer the research questions of this study in a logical manner the report is structured as follows:

- Chapter two: the constructs of this study are defined, the arguments behind the necessity of the research as well as the arguments supporting the hypothesis formulation are discussed in terms of academic literature
- Chapter three: the hypotheses of this study are stated with a summary of the arguments supporting it from the preceding chapter
- Chapter four: the research methodology choice for this study is described and defended
- Chapter five: the summary, analysis of the data and results of the statistical tests on the data are presented
- Chapter six: the chapter five results are discussed in terms of the literature from chapters one through three
- Chapter seven: the main research findings are summarised, suggestions to users of the research on the potential impact the findings may have on their work, the limitations of the study and recommended future studies are outlined

2. LITERATURE REVIEW

2.1 Introduction

This chapter describes the theory and academic arguments behind the constructs chosen for the study. The theory forms the base for the research questions that the study will answer. The purpose of the research itself is to understand the relationship between cognitive diversity, transformational leadership and the team performance outcomes. Understanding the constructs at a deeper level will provide background to the research needs which were introduced in Chapter one, provide an argument as to how the research hypothesis was formulated in Chapter three, and the necessary context to analyse the research results in Chapter six.

First, the concept of organisational diversity is defined as the necessary conditions for a diverse climate to exist, as described in the outcomes of recent research where diversity was studied in organisations. This review of the literature provides the background to understanding diversity as a broad construct and thus cannot be studied in its entirety. Cognitive diversity, which is a sub type variable within the broader diversity definition, is chosen as the subject of this study. Cognitive diversity is then reviewed in terms of both its definition, research findings on the construct and establishes the need for having cognitively diverse teams in today's changing business environment. Both positive arguments for - and the challenges of having cognitively diverse teams - are analysed. The identified challenges set the context for understanding and identifying that a moderating variable would be necessary for the study.

The review of diversity and its related outcomes helped identify the dependent variable of the study. The construct of team performance is defined in terms of the literature and arguments for the dependency were formulated where past research has been conducted on diversity in relation to different performance-related outcomes. Leadership, specifically transformational leadership, is defined in the literature as the moderating variable because the nature of this type of leadership is considered to

minimise the negative influence and maximise the positive influences of team diversity on team outcomes (Kim, Lee, & Bian, 2012).

The review of the literature showed that there is a lack of understanding of the relationships between the constructs chosen for the study even though there is much literature on the constructs themselves. This chapter is concluded with a summary of the main theories for each construct and re-iterates the need for the research

2.2 Diversity theory

Workplace diversity, including relational demography (the degree to which the individual demographic attributes are shared with the rest of the group), is argued to benefit businesses due to its ability to grow the pool of customers, attract top talent, support creativity and innovation and grow the knowledge base for better decisions to be made (Guillaume et al., 2017). Diversity in the workplace can be defined as; “the representation of multiple identity groups and their cultures in a particular organisation or workgroup” (Ferdman & Deane, 2014, p. 3).

The concept of ‘inclusion’ has been at the foundation of research regarding diversity in the workplace. The research suggests that managers in the organisation can enable inclusion through individual or group experiences, through a set of behaviours, a specific leadership style, a set of collective practises and norms or through a specific value set (either personal, social, group or organisational values). Diversity is also seen as important because it can be used as a tool to eliminate unfair or illegal bias and discrimination and increase social as well as equity justice. It has also been linked to benefits for individuals, groups and organisations (Ferdman & Deane, 2014).
This is a necessary pre-requisite for building a collaborative team, described below in section 2.4. For a team to function effectively, the members need to commit to joint efforts in achieving a common goal. If there is a perceived presence of discrimination or bias, this can negatively impact the performance of the team as the members can sense a lack social and equity justice within the team.

Kim, Lee and Bian (2012) defined diversity as the “distribution of differences among the members of a unit with respect to a common attribute such as tenure or ethnicity” (p. 198). The value of team diversity according to the literature comes from the increased scope and range of knowledge, skills and opinions within a team. This in turn can be a valuable source of individual creativity and can encourage team members to combine information and opinions from each other, given their different knowledge, skills, thinking styles and perspectives. Furthermore research has indicated the positive relationship between diversity and creativity - however mixed results have been found when diversity has been studied in relationship to decision making, problem solving and generation of new ideas (Kim et al., 2012). This calls for the study to look at including a moderating variable where diversity delivers the intended benefits. Leadership can be one of those variables, because of the underlying characteristic of the leader’s ability to influence others in a team or an organisation towards a specific outcome. Leadership can be defined as “the ability to motivate, influence and enable other people to contribute to the success and effectiveness of the organization” (Maamari & Majdalani, 2017, p. 329). Leadership style, the leaders’ attitudes and behaviours and the leaders’ management style all influence how employees perceive, react and behave towards their work. This means that the way the leader makes decisions, motivates employees, manages and deals with difficult situations or crises in the organisation all affect organisational outcomes (Maamari & Majdalani, 2017). Within this study, the organisational outcome which will be studied specifically is team performance.

Diversity research on educational and surface level (demographic diversity) has shown mixed outcomes when studied in relation to team performance outcomes. There are two contradictory schools of thought on the outcome predictions of diversity; one is the ‘information/decision making’ perspective and the other is the ‘social categorisation’ perspective. The information/decision making perspective school of thought is that diversity will have a positive outcome as it creates a larger pool of cognitive resources for the team to utilise. The contrasting social categorisation perspective school of thought suggests that dissimilarities amongst diverse members of a team would present negative social categorisation processes therefore a negative outcome as a result of diversity (Valls, González-Romá, and Tomás, 2016).

Van Knippenberg, De Dreu and Homan (2004) devised a categorisation elaboration model (CEM) which suggests that these two contradictory perspectives can be combined to support improved prediction of its influence on team output through determining when it will enhance or diminish team functioning. All elements of diversity have the potential to enhance or diminish team performance so contingencies need to be determined that will improve the use of teams' cognitive resources and reduce the intergroup bias associated with categorisation processes (Valls et al., 2016). This suggests that the use of a moderating factor that can enhance team collaboration and reduce team conflict needs to be studied when the relationship between diversity constructs is studied to effect a specific team outcome. Leadership is a possible moderator that may have the type of influencing quality required and is described in section 2.4 below.

Guillaume et al. (2017) reviewed available secondary research, both qualitative and quantitative, on work group and organisational diversity as well as on relational demography. The outcome of the qualitative research is a hypothesised model showing relationships between the six moderating effects of a diverse climate and the three proposed outcomes of workplace diversity (refer to Figure 1) which can be researched in future. Sections of this model form the basis of the current study. The proposed six moderating factors to a diverse climate in the organisation are strategy, HR practices, leadership, culture, unit design and individual differences. It is proposed that the outcomes of having a diverse climate are performance, social integration and well-being. Diversity is a broad construct which has multiple variants within it, for example demographic diversity, cognitive diversity or socio-economic diversity.

This study will be scoped to test cognitive diversity (section 2.3) and its relationship to the performance outcome (section 2.4). One moderating variable which will be tested in the study is the influence of leadership - specifically 'transformational leadership' (section 2.5) - on the relationship.

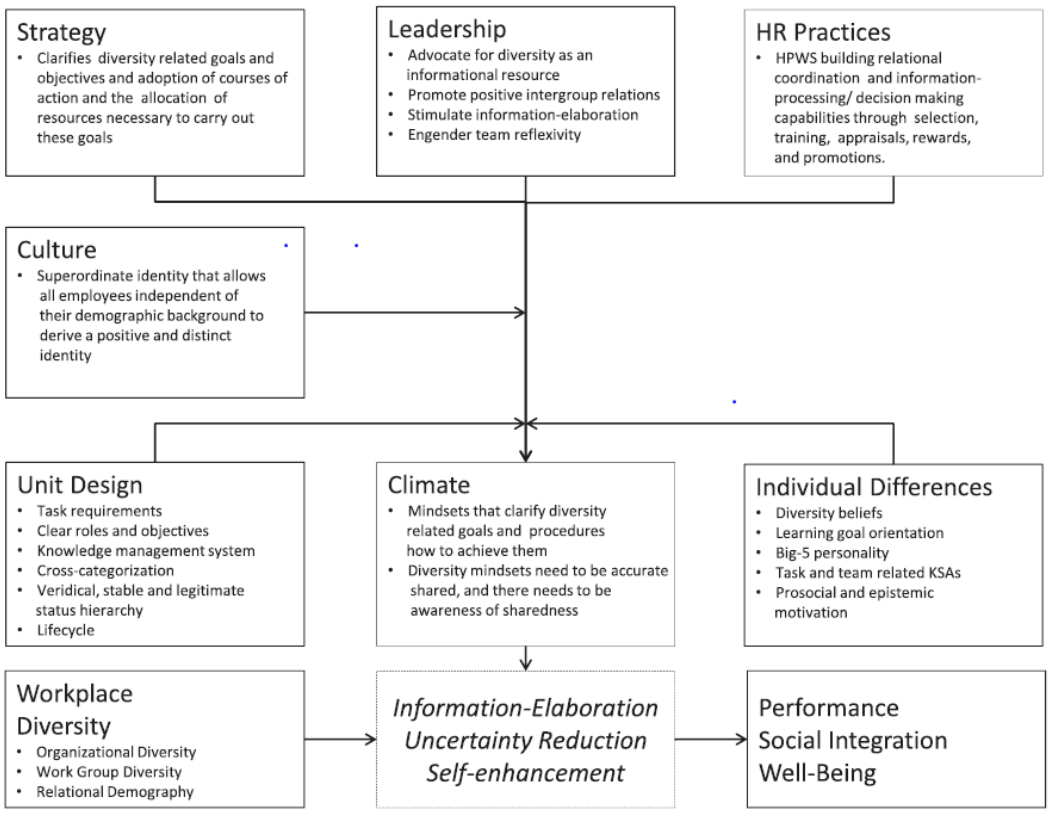

Figure 1: Proposed moderators of workplace diversity effects on social integration, performance, and well-being-related variables (Guillaume, Dawson, Otaye-Ebede, Woods, & West, 2017, p. 239)

2.3 Cognitive diversity theory

Cognitive diversity can be defined as "perceived differences in thinking styles, knowledge, skills, values, and beliefs amongst team members" (Wang et al., 2016, p. 3231). The theory refers to perceived differences amongst the team members' attributes and therefore the study will measure the broader scope of cognitive diversity and the construct's scale of measurement will be based on the research participants' perceptions of the team members' differences in attributes listed under its definition.

Two experimental studies by Hoever, van Knippenberg, van Ginkel, and Barkema (2012) and Kurtzberg (2005), associated cognitive diversity to team creativity. The research found that where team members approached the problems from differing

perspectives due to differences in their cognition, it led to unique and creative solutions. The team members had to take in each other's perspectives and ideas which resulted in a higher level of information elaboration. A further quantitative study, based on the results of the experiments on whether a positive relationship exists between cognitive diversity and team creativity, concluded that this relationship exists. Creativity was described in this study as the "production of novel and useful ideas concerning products, services, processes, and procedures by a team of employees working together" (Wang et al., 2016, p.3231).

The value in the cognitive diversity argument is shown through the team members' exposure to differences within the team stimulating the individual members into generating innovative ideas and motivating them to rearrange and combine the different opinions and ideas that the team comes up with. Team diversity was found to be positively related to creativity because it improved the team members' scope of perspectives and knowledge (Kim et al., 2012).

Demographic diversity often referred to as surface diversity is more likely to cause social categorisation processes within the team while cognitive diversity is thought to enhance creativity. Creativity is enhanced through collaboration of different ideas, idea building between team members and experimentation with unique ideas of people with differing cognition. The team can produce this output as they are exposed to a vast range of ideas, opinions, knowledge and values. It is therefore argued that demographic diversity may cause relational conflicts while cognitive diversity is argued to increase task conflicts (Kim et al., 2012).

Cognitive diversity can be argued to bring out differing views and cognitive resources which are important for tasks that require a large foundation of knowledge and creativity. Literature on this construct argues that individuals within a team are exposed to differing opinions and perspectives, this enables the team to learn more and enhances the individual members motivation towards task engagement resulting in more unique and creative ideas (Chen et al., 2019; Wang et al., 2016). The underlying argument is based on task-related processes and it is proposed that the team will improve performance on the tasks if they are more cognitively diverse

because they would seek out a greater depth and breadth of knowledge, ideas and information to complete tasks. Furthermore, cognitive diversity is considered to motivate team members to challenge the old ways of working, to look for new and improved ways of performing tasks when problems are encountered in their execution. This is done through discussion and collaboration, which in turn stimulate innovative behaviour. This is known as task reflexivity, where the group continually reflects on and communicates its strategy, objectives and process (ways of working) and adapts them to changing circumstances (either current or anticipated). By doing this, the team changes the current way of working and takes actions to achieve a new objective or outcome.

The counter-argument to having cognitive diversity in teams is that it can cause an illicit intergroup bias, where team members can treat the others with different cognitions as the outgroup members and this can result in the individuals becoming unwilling to innovate. To limit this type of occurrence, influences on the group's perceptions of support and external approval of individuals' innovative activities can have context specific impact on the outcome of a cognitively diverse team. This further suggests that a moderating factor be considered when studying the relationship between a cognitive diversity variable and an outcome variable (Chen et al., 2019). Chen et al. (2019) conducted a study to understand the relationship between cognitive diversity and task reflexivity with the outcome of innovative work behaviour and the relationships were all found to be positive; a positive moderating influence on the relationship was perceived support for innovation.

A further study set out to determine whether professional commitment is related to team effectiveness and whether this relationship is mediated by cognitive diversity. The study suggested that professionals are motivated to seek out a greater range of information to make better decisions because they are committed to their profession and do not want to bring into disrepute. The underlying argument is that members of a multidisciplinary team are motivated to communicate and display their profession's unique skills, competencies and priorities and therefore the team itself will be cognitively diverse which in turn will ensure decisions are made with diverse knowledge, opinions and disciplinary skills (Mitchell et al., 2017). Task conflict, on the

other hand, is argued to moderate the relationship, resulting in team members disagreeing and diverging on task-related issues and not merely performing the task in the same way it was performed before. This in turn will enhance the likelihood that the individuals will use their diverse professional skills and perspectives to come up with an integrative solution to the task as opposed to conforming to the old way. The research findings were found to confirm the hypothesis that professional commitment is related to team effectiveness, mediated by cognitive diversity and moderated by task conflict (Mitchell, Boyle, & von Stieglitz, 2018). The relevance of this finding for the current study is that cognitive diversity can be related directly to a performance-related team outcome.

To be able to study cognitive diversity as an independent construct and its relationship to a performance-related outcome as the dependent variable, it is important to understand what the most appropriate way to study and operationalise the variable is. This is because it is both broad and subjective in nature as it relates to perceived differences amongst team members in their ways of thinking, skill sets, knowledge, values and beliefs. Wang et al. (2016). Mello and Rentsch (2015), conducted a qualitative study on the multiple definitions and views of cognitive diversity present in the literature with the aim of providing guidance to researchers so that more systematic studies can be performed on cognitive diversity and its influence the operations of the team. Because of the multiple definitions of cognitive diversity present in the literature, researchers have studied numerous constructs relating to cognitive diversity, which include differences in “job attitudes, strategic beliefs, values, perspectives, perceptions, work styles, cognitive styles, learning styles, problem-solving strategies, personality, goal orientation, need for cognition, knowledge, skills, cognitive ability, expertise, expertness, experience, functional background, educational background, preferences, and assumptions” (Mello & Rentsch, 2015, p. 627). The risk in this research is that the variables under study can have different meanings due to different contexts, time frames and subjective interpretations according to the individual’s perceptions. A method that operationalises and studies the variable is important. The perception towards a variable can be studied as a categorical or continuous variable. The argument for studying a construct as a continuous variable is that it allows for two dimensions of the attitude to be measured; direction (either agree

or disagree) and intensity level (strong or weak). This is typically conducted using a Likert scale with a neutral centre option. The four-item scale in Appendix A is therefore an appropriate measure of the cognitive diversity construct with the five-point Likert scale to operationalise it as it contains a centre neutral option.

Parayitam and Papenhausen (2016) studied cognitive diversity as part of three group processes in teams' functioning (agreement-seeking behaviour, trust and cognitive diversity) which were hypothesised to be positively related to strategic decision-making commitment and team effectiveness. The research findings confirmed the hypothesis and it was found that process conflict moderated the relationship. The process of cognitive diversity is seen as a required process for strategic decision-making because the differences in educational, functional and cultural backgrounds of the team improves depth and breadth of knowledge to make better decisions. It can however bring both positive and negative outcomes because it enables deep and critical evaluation of options for a decision but can cause conflict and disagreement. Overall, however, the positive effects should outweigh the negative effects and the team should be better off from a decision-making perspective. This research finding suggests that the positive relationship between cognitive diversity in a team and team effectiveness outcome can also suggest that a similar relationship can exist between cognitive diversity and a team performance outcome. With the understanding of what cognitive diversity entails, it is important to understand team performance as a theory to determine whether any relationships may exist between these two constructs.

2.4 Team performance as a theory

Teamwork involves "performing of tasks through joint work and interaction between individual members"(Zhang, Cao, & Tjosvold, 2011, p. 1586). How the team members collaborate and include the knowledge, efforts and expertise of all the individuals of the team is important for the understanding of this construct, as it not merely the sum of efforts of the individuals of the team. Teams can outperform individual members because diverse members can integrate knowledge and ideas in achieving a common objective. It is imperative for the team members to deliberate and formulate ways to co-ordinate their efforts and integrate their ideas to capitalise on the different abilities

of the individual members of the team (Zhang et al., 2011, p. 3). The leadership of the team is an important factor which can influence the level of co-ordination and integration. This is discussed below in section 2.5 where transformational leadership is considered as a factor which can influence the relationship between cognitive diversity and the team's performance.

Team performance is an overall outcome of teamwork, which can have a wide variety of meanings and can be researched using many different variables. In a study by Boies, Fiset and Gill (2015), performance was defined by the presence of two team outcomes, namely task performance and creative performance. Teams' task performance can be defined as "the extent to which a team meets or exceeds expectations about task requirements" (Boies, Fiset and Gill, 2015, p. 1081). Creative performance is understood as the team's capability in coming up with interesting new and unique ideas by a team of people working together. In the study by Boies, Fiset and Gill (2015) transformational leadership was found to be positively related to team performance, including variables of task performance and creative performance. This suggests that transformational leadership may also influence the relationship between cognitive diversity and team performance. As described in section 2.3 above, cognitive diversity was positively related to team creativity and innovation in multiple studies, in one of which cognitive diversity was one of the elements of team performance.

Hoisl, Gruber and Conti (2017), conducted a study on the effects of the extent of diversity within research and development teams on their performance outcomes in a hypercompetitive environment. The context behind the choice of study under hyper competition was relevant because of the current business environment; organisations are constantly challenged to improve and outperform one another. Diversity was defined in the study as persons in the team possessing different types of task-related experience. This is aligned to one of the dimensions on the four-item scale measuring cognitive diversity in Appendix A in this study. Task-related experience diversity was relevant for the study of R&D teams because the task outcomes of this type of team are normally non-routine and rely on a variety of inputs as well as greater flexibility than other teams in organisations. Diversity in teams is considered to attract greater knowledge, skills, opinions and relationship networks. This supports the identification

and assessment of solutions and it allows the team to create different perspectives to generate unique solutions that ensure higher performance. Diverse teams are less susceptible to group-think, ensuring higher performance outcomes because the defective solutions are not accepted by the team. The results of the study showed that task related experience diversity in R&D teams increases the team's performance but only up to a certain point. Too much diversity in the team can lead to reduced performance outcomes, as team collaboration and communication becomes problematic.

Demographic diversity has been studied widely (Solakoglu and Demir, 2016) with the aim of understanding whether this type of diversity is related to performance outcomes - generally it is expected that a positive relationship should exist. It is expected that a demographically diverse executive/leadership team in organisations should better understand the marketplace and therefore better serve the market segmentation needs for their product or service, resulting in greater performance. There is also a view that demographic diversity will also inherently create higher creativity and innovation, leading to performance. This is similar to the academic argument and research which suggests that cognitive diversity is positively related to innovation and creativity (Wang et al., 2016). In addition, a higher level of demographic diversity may lead to better corporate image and thus better performance. If selection of top management positions is from only a limited demography, it also limits the pool of managers from which individuals may be recruited and this can prevent the best available person being chosen. A demographically diverse group of leaders are thought to improve performance of an organisation because there is more information available about the business environment resulting in better decisions being made after careful assessment of all options available (Solakoglu & Demir, 2016). Although the study by Solakoglu and Demir (2016) refers to demographic diversity and specifically gender diversity, the arguments for the diversity relationship to a performance outcome suggests cognitive diversity aspects that presents itself when companies have demographically diverse teams. Further to this argument, one would also need to ask what role leadership plays on the relationship.

2.5 Transformational leadership

There are many perspectives on leadership which have led to a large theory base and extensive literature on the subject. Current research has evolved from the traditional trait- or personality-based leadership theory to more situational theory. This suggests that the situation in which leaders find themselves and are required to exercise leadership skills and characteristics is ultimately determined by the leader's management of that situation (Amanchukwu, Stanley, & Ololube, 2015). Relating the foregoing to the current study, which is aimed at understanding whether a relationship exists between cognitive diversity in a team and team performance, the leader of a cognitively diverse team would be in a situation where he/she would need to exercise specific leadership characteristics to enable the team to work as a unit. As mentioned in section 2.3, the negative aspects of cognitively diverse teams is intergroup bias where an in-group and out-groups can form based on people having differing cognitions (Chen et al., 2019). Leadership characteristics which focus on relationships between the leader and team members to motivate them towards performance outcomes and help them see the higher good of the task should moderate the relationship between a cognitively diverse team and the performance of the team (Amanchukwu et al., 2015). Transformational leadership characteristics - out of all the schools of leadership - represent the most appropriate moderating factor which should be included in this study of the relationship between cognitively diverse teams and team performance.

A further argument for transformational leadership as a proposed moderating variable in this study is illustrated by the model presented as Figure 1. One of the six moderating variables which enable a diverse climate in an organisation is leadership. The model proposes that leadership will positively moderate workplace diversity effects on 'social integration, well-being and performance-related' variables when it supports the elaboration and collaboration of differences in expertise, knowledge and perspectives and aids identification of individuals towards the team. Transformational leadership has been studied the most in terms of work group diversity, where it was found that this variable enhances the positive influence and reduces the negative influence towards team identification and performance, productivity energy and creativity (Guillaume et al., 2017). Due to time constraints this study was narrowed to

include only one of the eight moderating variables in the hypothesised model by Guillaume et al. (2017).

Past research supports the theory that transformational leaders, inspire their followers to work towards the team's collective goals, this can enhance the individual's commitment to the work, level of effort and performance. This effect of the leader influences followers to go beyond their own self-interest. The leader can do this by reducing the conflict through promoting the shared purpose of the group. It can be characterised by the ability of the leader to enhance the psychological attachment of the individuals towards the team. As a result, the members will probably incorporate the group values and identity into their own self-concept . Once the self-concept has been established - from "I" to "we" (referred to as the in-group identity), the team is committed to achieving team-oriented goals. The 'conflict management and reduction' attribute is an important aspect of transformational leadership as one of the risks identified in the cognitive diversity literature in section 2.3 is that differences in opinions stemming from the presence of a cognitively diverse team composition can lead to conflicts. (Chen et al., 2019).

The literature describes six dimensions of transformational leadership: determining and communicating a vision, providing an appropriate model, encouraging the acceptance of group goals, high performance expectation, providing individualised support, and intellectual stimulation (Zhang et al., 2011). All six dimensions of the construct suggest that the presence of a transformational leader can influence the relationship between cognitive diversity in a team and its relationship to the performance of the team. In short, the high-performance expectation dimension is more explicit within the construct itself.

There is a generally expected relationship positive relationship between cognitive diversity and team performance, however the level of variability to be observed in the relationship based on the literature suggests a moderator. It is therefore proposed that leadership behaviours could be the overarching factor that can show how much cognitive diversity improves the team performance outcome. The rapidly changing business environment requires teams to come up with new and innovative ideas to

solve complex problems and the leader is required to create and motivate a cognitively diverse team to collaborate and solve business problems as well as motivate the team towards performance in achieving the team's objectives (Wang et al., 2016). Transformational leaders use their qualities to connect with followers based on their morals and principles, this results in motivation of the followers towards high achievement levels and ownership of group goals. The followers are instinctively motivated to achievement of the goal itself and not necessarily the rewards that may be associated with the outcome. With this type of leadership style, the team can be motivated to the long-term vision and inspired to go above and beyond what would normally be expected of them, thereby improving performance of the team members through their ability to increase their efforts when taking on tasks (Nguyen, Mia, Winata, & Chong, 2017).

Transformational leadership is achieved through four unique but dependent behaviours; (1) 'idealised influence', where the leader behaves in a way that he/she wants their followers to also behave, (2) 'inspirational motivation' where the leader communicates an inspirational vision, (3) 'individualised consideration' where unique and personal attention is given to the follower and (4) 'intellectual stimulation' where preconceived ideas by the follower are challenged by the leader. The two dimensions of inspirational motivation and intellectual stimulation were found to be related to team performance variables of task performance and creativity (Boies et al., 2015). For example, leaders who show inspirational motivation paints an exciting vision of the future which functions as the group goal that the team works towards. It also suggests that the inspirationally motivating leader communicates and reiterates the competitive environment the team operates in and shows his/her confidence that the team will be successful. Lastly, this type of leader will emphasise the importance of working together as team to succeed. The leader who leverages off this behaviour would expect to lead a team to greater performance outcomes. The leader who leverages off intellectual stimulation behaviours to lead will determine and communicate role expectations aligned to creative outputs, particularly if there are opportunities requiring creative output. The expected results are more creative outcomes in terms of team performance. The team that is directed by an intellectually stimulating leader will most

likely be more open minded towards different possibilities, question assumptions, and think outside the box (Boies et al., 2015).

Kim et al. (2012) researched transformational leadership as a moderating variable between cognitive team diversity and individual creativity and found that there was a positive relationship only with a high presence of transformational leadership. The presence of this type of leadership is understood to minimise negative influences (e.g. the social categorisation processes) and maximise the positive influences of team diversity on team creativity. The research results suggest that transformational leadership can encourage individual's openness to new and different ideas, encourage individuals to value different perspectives and motivate them. It is therefore argued that transformational leadership will be likely to assist the team members in effectively utilising the cognitive resources arising from cognitive team diversity. Similar research by Choi, Kim, Ullah, and Kang (2016) showed how transformational leadership facilitates innovative work behaviour. They argue that transformational leadership characteristics motivate and intellectually stimulate employees to work towards a long-term vision, and all employees collectively work towards achieving this vision. This stimulates knowledge-sharing and cross-functional learning across the organisation, resulting in the generation of new ideas and innovative behaviour. Understanding this research in relation to this study, it can be argued that transformational leadership can stimulate both cognitive diversity in the organisation through its encouragement of cross-functional learning and knowledge-sharing as well as stimulate greater performance outcomes through more innovative ideas. It therefore supports the argument in this study that transformational leadership enhances the positive effect of cognitive diversity on performance outcomes.

Following on from the argument that transformational leadership could minimise negative influences and maximise positive influences of diversity within the functioning of the team; transformational leadership is also linked to employee engagement. Research by Chin, Lok and Kong (2019) shows that there is a positive relationship between the two constructs. This is relevant when considering whether transformational leadership could moderate a relationship between cognitive diversity in a team and the team's performance. This is because the leader emphasises to the

followers their responsibilities for taking on greater workplace challenges, which results in their higher levels of psychological meaningfulness, psychological safety and psychological availability. Research findings also confirm the positive relationship between transformational leadership and self-concordance (Chin et al., 2019). As a result, the followers find their work more meaningful which is in turn associated with creative and extra-role performance. This further supports the argument that transformational leadership could moderate the relationship between cognitive diversity and team performance.

Transformational leadership is argued to be the most likely type of leadership style to moderate the relationship between cognitive diversity and team performance. No consideration has been given to the other styles in the study of management. The other more recognised styles are charismatic leadership and transactional leadership (Anderson & Sun, 2017). Charismatic leadership and transformational leadership are often described as similar leadership styles because their characteristics are closely aligned. This type of leadership is characterised as a style whereby the leader instils a vision for the future which inspires followers to sacrifice their own self-interest and apply increased effort to the leader's supported causes. Transactional leadership is characterised by two types of behaviours; 'contingent reward' and 'management by exception'. Contingent reward is where the leader determines and communicates the expectation and reward for achievement. Management by exception is defined by the degree to which the leader takes corrective actions when there are deviations from the leader-follower transactions (Anderson & Sun, 2017). Anderson and Sun (2017) also describe the more emerging styles of leadership in the literature; ideological leadership, pragmatic leadership, authentic leadership, ethical leadership, spiritual leadership, distributed leadership, integrative public leadership and servant leadership. Based on the reviews of all the leadership styles, both emerging and traditional, transformational leadership is still considered to be the most appropriate moderating leadership style for the study of the relationship between cognitive diversity in teams and team performance. This is because of the ability of the transformational leader to inspire through a vision and motivate their followers to go above and beyond the task at hand to achieve performance, challenge the status quo of doing tasks and encourage innovation and creativity and finally provide the necessary individual

support as mentor and coach to followers to reach their potential (Anderson & Sun, 2017).

2.6 Conclusion

The purpose of this study is to understand whether a relationship exists between cognitive diversity, transformational leadership and team performance - and whether the cognitive diversity and team performance relationship is moderated by transformational leadership. The literature reviewed in this chapter showed that cognitive diversity has been studied previously in relation to team creativity and innovation, however not to performance outcomes (Wang et al., 2016; Chen et al., 2019). Team performance has been widely studied in relation to wider definitions of diversity - mainly demographic diversity - as an outcome variable (Solakoglu and Demir, 2016) but not studied in relation to cognitive diversity. Transformational leadership was identified as a good moderator for this study because of its influence in enhancing the positive impacts and reducing the negative impacts of diversity on teams.

Further to this, the characteristics of the transformational leader motivate and intellectually stimulate employees to work towards the vision and objectives of the team (Chen et al., 2019; Kim et al. 2012; Choi et al., 2016). The hypothesised model (figure 1) by Guillaume et al. (2017), which describes three outcomes (including the performance outcome) of a diverse climate and the six moderators (including the leadership construct) that influence the diverse climate assisted the researcher to understand the interrelatedness of the three constructs in this study.

3. RESEARCH HYPOTHESIS

3.1 Research hypothesis

This research aims to understand whether a relationship exists between cognitive diversity, transformational leadership and team performance. Existing research on cognitive diversity seeks to understand its relationships with team creativity and innovation outcomes (Wang et al., 2016), however the hypothesised model in chapter two by Guillaume et al. (2017) suggests that diversity could be related to greater positive outcomes - specifically performance, social integration and well-being. This study specifically focuses on team performance and whether a positive relationship exists between cognitive diversity and team performance.

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Transformational leadership was also considered as a moderating factor on the hypothesised relationship. This is because of the positive and negative influences of cognitive diversity on team functioning (Chen et al., 2019) requires a transformational leader who can influence the team to enhance the positive and reduce the negative impact of cognitive diversity to improve performance outcomes. Furthermore, the qualities of the transformational leader inspires and intellectually stimulates the followers to work towards the team goals (Chen et al., 2019; Kim et al. 2012; Choi et al., 2016). The model by Guillaume et al. (2017) also supports and suggests leadership as one of the six moderators of the relationship between diverse climate and the three outcomes (performance, social integration and well-being).

For moderation to be tested the moderating variable, which is the second independent variable of this study, must also be related to the outcome variable; as such a positive relationship between transformational leadership and team performance needs to be shown. Zhang et al. (2011) performed a study of teams within a large Chinese parastatal to determine whether transformational leadership promotes team co-ordination as a mediating variable that ultimately resulted in the team performance outcome. This study suggests that there would be an expected positive relationship between transformational leadership and team performance in a South African context.

Summarising the literature and arguments discussed thus far, the following research questions are formulated:

Hypothesis 1: There is a positive relationship between perceived team cognitive diversity and team performance

- Null hypothesis one ($H_0$1)
  No significant positive relationship exists between cognitive diversity and team performance
- Alternate hypothesis one ($H_1$1)
  A significant positive relationship exists between cognitive diversity and team performance

Hypothesis 2: There is a positive relationship between transformational leadership and team performance

- Null hypothesis two ($H_0$2)
  No significant positive relationship exists between transformational leadership and team performance
- Alternate hypothesis two ($H_1$2)
  A significant positive relationship exists between transformational leadership and team performance

Hypothesis 3: The positive relationship between cognitive diversity and team performance is moderated by transformational leadership

- Null hypothesis three ($H_0$3)
  No significantly positive relationship exists between cognitive diversity and team performance moderated by transformational leadership exists
- Alternate hypothesis three ($H_1$3)
  A significant positive relationship exists between cognitive diversity and team performance moderated by transformational leadership

3.2 Conclusion

The hypothesised relationships are shown graphically in figure 2 below. Hypothesis 1 aims to understand whether a relationship exists between cognitive diversity and team performance. Hypothesis 2 aims to understand whether a relationship exists between transformational leadership and team performance as a prerequisite for hypothesis 3. Hypothesis 3 aims to understand whether transformational leadership moderates the relationship between cognitive diversity and team performance.

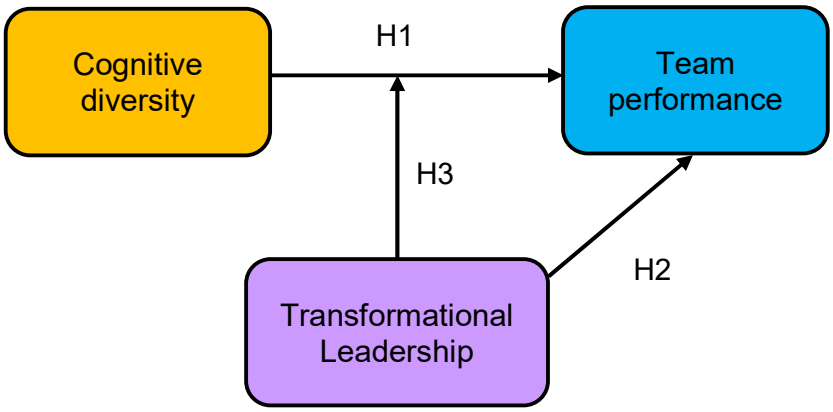

Figure 2: Hypothesised theoretical model

4. RESEARCH METHODOLODY AND DESIGN

4.1 Choice of methodology and design

The researcher followed a positivist research philosophy because the hypotheses were directed towards understanding the relationship between cognitive diversity and team performance as well as the relationship between transformational leadership and team performance. Positivists aim to uncover existing facts or reality and the researcher is required to use neutral, unbiased research methods to determine the facts (Muijs, 2011). A positivist's understanding of constructs is that they are real and precise and therefore will use a research design that allows for measuring what they are investigating (Farquhar, 2012).

Saunders and Lewis (2018) describe three approaches to theory development; deduction, induction and abduction. The most appropriate approach for this study is a deductive one because it supports the research strategy followed in the study. Research questions were determined from existing theory on the definitions and interrelatedness of the three constructs; cognitive diversity, team performance and transformational leadership, which were then translated into hypotheses. Data was collected to test the hypotheses and was analysed to confirm whether it supported the theory or whether the theory needs modification.

For purposes of this study a mono method strategy of data collection in the form of a survey was used as this method is the most appropriate (Saunders and Lewis, 2018). A mono method is adopted because the research hypothesis was derived from existing theory which provided the constructs and it explained how the data should be collected. The three constructs operationalised through scales measuring the elements of the constructs presented in the survey were in place to determine the reality. The researcher can then produce an objective view of the reality by analysing the data to determine a conclusion about the population (Poni, 2014)

The most appropriate design is the explanatory; studies following this method are aimed at seeking explanations of events or occurrences through discovery of causal relationships and looks to understanding its nature (Saunders and Lewis, 2018).

Given that this study aims to understand whether a positive relationship exists between cognitive diversity, transformational leadership and team performance, the most appropriate method of research design is an explanatory study.

The research design used a survey as the methodology. The main instrument was a survey questionnaire which was conducted using an online tool. The questionnaire was in a standardised format to the sample selected from the target population. The benefits of this strategy according to Saunders and Lewis (2018) are that it:

- Allows for collection of data from many respondents about the same matter under study.
- Is cost effective, this is due samples being used to generate findings representative of the population using statistics.
- Is standardised and therefore makes the data collected easy to compare and analyse across different locations
- Allows for a high level of control through the research process (see below section 4.4.1 where a pre-test will be performed)

Due to the time constraints a cross-sectional study was performed and the questionnaires were used to collect data at a point in time from a sample. This was then used to make inferences about the population of the study.

4.2 Population

The target population was professional, middle and senior management individuals within corporates in South Africa. As mentioned in Chapter one and three, the purpose of the study is to determine whether a relationship exists between cognitive diversity, transformational leadership and team performance. The main argument supporting the hypothesis formulation was based on research and development of a hypothesised model by Guillaume et al. (2017) of all variables moderating a diversity mindset (climate) in the organisation and the proposed outcomes of a diverse environment being ‘social integration, performance and well-being’, drawing on factors that organisations and managers have control over. A further argument for researching managers in South Africa is their broad exposure in the organisation and their ability to

assess whether cognitive diversity exists in their teams. They also have access to information on the performance of their teams and have more opportunities to be included in multi-disciplinary teams, where cognitive diversity is more prevalent. The population is limited to ensure reliability and consistency of the data so that a comparative analysis can be performed. The researcher also understood that opinions on variables tested in the study were more likely to be valid at higher levels of the company where exposure and access to information about their organisations is extensive. There is a geographic population limitation on the study as the population is defined within the borders of South Africa, however the researcher only has access to participants in the Gauteng area.

A survey in the form of an online questionnaire was the instrument used to collect the data as the target population of middle and senior managers and professionals were most likely to have access to a personal computer or smart phone to be able to answer the survey, thus ensuring a higher response rate. All industries were considered as the concept of workplace diversity transcends industry lines and is a concept which all managers and leaders face within their organisations.

4.3 Unit of analysis

Professional, middle and senior managers within corporates in South Africa represent the unit of analysis. These are the individuals from whom data required for the study will be collected.

4.4 Sample size and sampling method

The process of sampling in statistical analysis allows researchers to make inferences about the population under study by testing a representative sample from that population. This is the most practical and cost-effective approach. Because it is impractical to obtain a listing of the total population of professionals, senior and middle managers in the country and be able to contact each of them, the researcher chose non-probability sampling. This sampling technique is the appropriate choice as Saunders and Lewis (2018) suggest that, in instances where the entire list of the population cannot be obtained and the probability of selection of each member cannot be computed, non-probability sampling should be used. The sample selection method

was purposive in nature to select professionals, senior and middle managers in South African corporates.

The online questionnaire, conducted using a tool called SurveyMonkey, was suitable because it allowed for the questions to be asked of the sample population about their opinions relating to the research hypothesis constructs - which were subsequently translated into numbers. Snowball sampling was used to increase the participation in the survey and to supplement data gathering. This method supports the primary sampling method as it is also a form of non-probability sampling. The identified participants for the study were encouraged to forward the link to the survey if their recipients met the population criteria for the study and would be able to answer the questionnaire (Saunders and Lewis, 2018). This is also an appropriate method to use when the entire population listing cannot be obtained as it can assist the researcher in obtaining additional respondents which would normally be difficult to include in the sample.

To determine the sample size required for the study, the researcher considered rules of thumb, recommended when conducting quantitative research using the correlation and regression tests as the main research tools to test the hypothesis. Morgan and Voorhis (2007), suggested a sample of n>50 as the minimum, with the number increasing as the number of independent variables increases. The suggested increase is n>50+8(m) where m is the number of independent variables. Based on the rule of thumb the minimum sample here would be 64 as there are two independent variables in this study (cognitive diversity and transformational leadership). Vergouwe, Steyerberg, Eijkemans, and Habbema (2005), conducted a study to determine what the effective sample size would be so that the relevant differences in a predictive regression model can be detected with sufficient power and 5% significance level. Their study suggests a minimum of 100. Given that this study uses regression as a form of prediction (see below section 4.7 Analysis approach), the researcher aimed to collect, as a minimum, 100 samples. This also covers the rule of thumb principle.

4.5 Measurement instrument

4.5.1 Questionnaire design

A questionnaire was used as the only research instrument for this study because it allowed the researcher to gather perceptions and sentiments from participants who had been chosen purposefully. The survey was sent to the sample population of professional, senior and middle managers because they were the appropriate selection of individuals who would be able to provide opinions on the variables under study, thus providing an acceptable level of reliability and accuracy. The instrument was in three sections; a preamble containing the introduction to the study explaining why the research is being conducted and how it would contribute to the field of study of business in South Africa. The second section (Part A) contained specific demographic questions which assisted the researcher in determining the control variables because the questions posed helped gain an understanding of the suitability of the individual for the study. The demographic question used to determine the control variable was; "What is the job level in the organisation you work for?". This assisted in determining whether the respondent fell within the target population. The demographic variables in the instrument were job level in the organisation currently working for, age, gender, highest level of education, the industry of their employer, and number of years of service working for their current employer.

The third section (Part B) contained questions on the perception of cognitive diversity within the participants' teams, the team's performance and the transformational leadership qualities of the leader. A Likert scale with five points was used for the respondents to select the most appropriate option. For the three constructs forming part of this study, the Likert scales which were operationalised in the questionnaire where either based on varying levels of agreement to a statement or asking respondents to choose a certain degree of extent to which a construct statement was present in their team . An example of the scale anchors is shown below in Table 1.

Table 1: Example of Likert scale anchors

1	Strongly disagree
2	Disagree

3	Neither agree nor disagree
4	Agree
5	Strongly agree

This enabled the researcher to analyse and evaluate the nature of the relationship between cognitive diversity in teams and team performance. A sample of the questionnaire can be found in Appendix A.

The questionnaire was designed to be able to gather data on three variables, cognitive diversity, team performance and transformational leadership. Perceptions from the respondents on the variables were gathered when they completed the survey. Each set of questions measuring a construct was determined from existing literature. The following sub sections will describe how the questions were sourced, the dimensions for each variable and how they have been used before.

One of the limitations of this study is that its purpose is aimed at gaining a deeper understanding of the three constructs and the relationships between the constructs. The study aimed at determining level of cognitive diversity within teams, the teams' performance and transformational leadership characteristics of the leader of teams within various organisations in South Africa. This suggests that the data should be collected from teams and not from individuals. However, the research approach followed was to survey managers about their perceptions of the variables in relation to the teams they form part of. This approach was followed to obtain data about various teams in a shorter time frame as time was a constraint in this study. This is also discussed in Chapter seven under limitations and possible future research section.

4.5.1.1 Perceived cognitive diversity

Cognitive diversity was defined earlier in Chapter two as "perceived differences in thinking styles, knowledge, skills, values, and beliefs amongst team members" (Wang et al., 2016, p. 3231). The theory refers to perceived differences amongst the team members' attributes, therefore the study measures the broader scope of cognitive diversity and thus the construct's scale of measurement is based on the research

participant's perceptions of the team members' differences in attributes such as thinking styles, knowledge, skills, values, and beliefs. The questions measuring this construct were derived from Van der Vegt and Janssen (2003), who studied perceived task and goal interdependence in teams on innovative behaviours where varying degrees of group diversity were present. This set of questions measuring the cognitive diversity construct was later used in a study by Wang et al. (2016) where the relationship between cogntive diversity and team creativity was studied together with a mediator (intrinsic motivation) and moderator (transformational leadership). The Cronbach alpha (measuring the reliability of the cognitive diverstiy scale) in this study was 0.9 which was greater than the acceptable 0.7. Table 2 below shows the questions used to determine whether perceived cognitive diversity exists in a team. Each question covers a different dimension of the definition of cognitive diversity described earlier.

Table 2: Cognitive diversity questions

Question number	Question	Source of the question
CD1_B7	To what extent do the members of your team differ on way of thinking	Van der Vegt and Janssen (2003), p. 737
CD2_B8	To what extent do the members of your team differ on composition of knowledge and skills	Van der Vegt and Janssen (2003), p. 737
CD3_B9	To what extent do the members of your team differ on views on the world	Van der Vegt and Janssen (2003), p. 737
CD4_B10	To what extent do the members of your team differ on beliefs on what is considered right or wrong	Van der Vegt and Janssen (2003), p. 737

4.5.1.2 Team performance

As discussed in Chapter two, team performance is an overall outcome of teamwork which can have a wide variety of meanings and can be researched using many variables. The group of questions measuring team performance was adopted from the

Zhang et al. (2011) study of the relationship between transformational leadership and team performance mediated by team approach to conflicts and team co-ordination. The questions were developed by the researchers through interviews with management team members, team directors and managers from higher administrative offices of the organisation. This was done to determine the most important business objectives to be achieved for the unit and operationalise it into a scale that can measure the unit's performance. The seven most important objectives were identfied and statements about the extent to which management team achieved the objective in leading its unit were defined for the study. These seven statements are not business objectives specific to a particular organisation or industry (with the two exceptions noted below) and are universal enough to be used in the current study to measure business unit and team performance.

Two questions were modified slightly to apply to a company business unit. The original study for which this scale was developed was a parastatal organisation. The question listed as TP2_B12 in the original study read only as "Under the team's leadership the unit has rapid profit growth". This statement was adapted to include cost savings growth, as some units are only cost centres in organisations and measured not in terms of profits but reduction in costs, however both achieve the same objectives - to increase overall company profits.

The second modification was for question listed as TP4_B14, which in the original study was "Under the team's leadership the unit builds good relationships with the local government". This was adapted to read "Under the team's leadership the unit builds good relationships with stakeholders". This modification doesn't change the overall meaning of the statement in relation to measuring team performance but does enable the researcher to use the scale to measure the same business objective in a company context. For parastatal organisations, the major stakeholder is the government whereas for companies, there are a wider range of stakeholders where relationships need to be maintained.

Each question in the scale below measuring team performance was asked within the context of whether there is perceived performance or lack thereof under the team's

current leadership. This was done to be able to measure the moderating effect of transformational leadership, as hypothesised in this study, over the same timeframe. The Cronbach alpha measuring reliability of the construct scale in the study by Zhang et al. (2011) was 0.91 which was greater than the acceptable 0.7. Table 3 shows the questions used to determine the level of team performance for the study.

Table 3: Team performance questions

Question number	Question	Source of the question
TP1_B11	Under the team's leadership the unit has rapid revenue growth	Zhang, Cao, and Tjosvold (2011), p.1608
TP2_B12	Under the team's leadership the unit has rapid profit growth /cost savings growth* (if unit is a cost centre)	Zhang, Cao, and Tjosvold (2011), p.1608
TP3_B13	Under the team's leadership the unit is slow in expanding major business	Zhang, Cao, and Tjosvold (2011), p.1608
TP4_B14	Under the team's leadership the unit builds good relationships with stakeholders*	Zhang, Cao, and Tjosvold (2011), p.1608
TP5_B15	Under the team's leadership the unit enjoys good reputation in the local region	Zhang, Cao, and Tjosvold (2011), p.1608
TP6_B16	Under the team's leadership the unit has high employee satisfaction	Zhang, Cao, and Tjosvold (2011), p.1608
TP7_B17	Under the team's leadership the unit has high employee morale	Zhang, Cao, and Tjosvold (2011), p.1608

* These have been adapted slightly to apply to survey respondents from a non-parastatal organisation but have not changed the overall meaning of the item in the scale

4.5.1.3 Transformational leadership

The group of questions measuring transformational leadership was adopted from the Zhang et al. (2011) study of the relationship between transformational leadership and team performance mediated by team approach to conflicts and team co-ordination. The original scale was developed by Podsakoff, MacKenzie, Moorman, and Fetter (1990) and described the six dimensions of transformational leadership which are; describing and communicating a vision, being an appropriate role model, encouraging group goal acceptance, high performance expectation, personalised support, and intellectual stimulation. Zhang et al. (2011), however, used the adapted Chinese version of this scale. This version is also an appropriate scale to use in the South African corporate context because South Africa, like China, is an emerging market economy. The scale is also in the English language. The Cronbach alpha measuring reliability of the construct scale in the study by Zhang et al. (2011) was 0.96 which was over the acceptable 0.7. The questions were asked of respondents based on the extent to which they agreed or disagreed with the statement on whether their leader exhibits the following characteristics. Table 4 shows the questions used to determine whether there is perceived transformational leadership in the respondents' teams.

Table 4: Transformational leadership questions

Question number	Question	Source of the question
TL1_B18	My team leader has a clear understanding of where we are going.	Zhang, Cao, and Tjosvold (2011), p.1606-7
TL2_B19	My team leader paints an interesting picture of the future for our group.	Zhang, Cao, and Tjosvold (2011), p.1606-7
TL3_B20	My team leader is always seeking new opportunities for the organization	Zhang, Cao, and Tjosvold (2011), p.1606-7
TL4_B21	My team leader inspires others with his/her plans for the future	Zhang, Cao, and Tjosvold (2011), p.1606-7
TL5_B22	My team leader is able to get others committed to his/her dream	Zhang, Cao, and Tjosvold (2011), p.1606-7
TL6_B23	My team leader leads by 'doing', rather	Zhang, Cao, and Tjosvold

	than simply by 'telling'	(2011), p.1606-7
TL7_B24	My team leader provides a good model for me to follow.	Zhang, Cao, and Tjosvold (2011), p.1606-7
TL8_B25	My team leader leads by example	Zhang, Cao, and Tjosvold (2011), p.1606-7
TL9_B26	My team leader fosters collaboration among work groups	Zhang, Cao, and Tjosvold (2011), p.1606-7
TL10_B27	My team leader encourages employees to be 'team players'	Zhang, Cao, and Tjosvold (2011), p.1606-7
TL11_B28	My team leader gets the group to work together for the same goal	Zhang, Cao, and Tjosvold (2011), p.1606-7
TL12_B29	My team leader develops a team attitude and spirit among employees	Zhang, Cao, and Tjosvold (2011), p.1606-7
TL13_B30	My team leader shows us that he/she expects a lot from us	Zhang, Cao, and Tjosvold (2011), p.1606-7
TL14_B31	My team leader insists on only the best performance	Zhang, Cao, and Tjosvold (2011), p.1606-7
TL15_B32	My team leader will not settle for second best	Zhang, Cao, and Tjosvold (2011), p.1606-7
TL16_B33	My team leader shows respect for my personal feelings	Zhang, Cao, and Tjosvold (2011), p.1606-7
TL17_B34	My team leader behaves in a manner thoughtful of my personal needs	Zhang, Cao, and Tjosvold (2011), p.1606-7
TL18_B35	My team leader challenges me to think about old problems in new ways	Zhang, Cao, and Tjosvold (2011), p.1606-7
TL19_B36	My team leader asks questions that prompt me to think	Zhang, Cao, and Tjosvold (2011), p.1606-7
TL20_B37	My team leader has stimulated me to rethink the way I do things	Zhang, Cao, and Tjosvold (2011), p.1606-7
TL21_B38	My team leader has ideas that have challenged me to re-examine some of my basic assumptions about my work	Zhang, Cao, and Tjosvold (2011), p.1606-7

4.5.2 Pilot testing of the research instrument

The survey contained questions that collected demographic data and data on the variables which assisted the researcher in answering the research hypotheses. Validity and reliability of the research instrument was covered through a pre-testing process and assisted the researcher in understanding whether the instrument questions would be appropriately understood by the participants (Saunders & Lewis, 2018). The researcher sent the survey to five individuals who met the population criteria. The pilot survey was used to determine whether the instrument was clear and whether the respondents were able to understand and answer the questions. This allowed the researcher to correct any problems that were identified by the individuals. The only amendment to the instrument resulting from this process was to clearly identify in italics each statement to which the respondent agrees or disagrees. This enabled the instrument to read more precisely. The timing of the completion of the questionnaire by the participants was measured in the pre-test.

It was structured to enable the researcher to seek information on the perceptions of these variables within the organisation. The questions were derived from literature on the variables in this research - cognitive diversity and team performance - and the moderator; transformational leadership. Questions were asked in a manner which did not influence the response and were asked in a logical manner to the respondents.

4.6 Data gathering process

An online survey tool, SurveyMonkey, was used as the data collection method and the survey was self-administered. As this is a cross-sectional study it is an appropriate tool to collect data at a specific point in time. The study only used one method of data collection in the form of a structured questionnaire. Due to research studies typically having low response rates the researcher reached out to potential respondents through multiple channels. This was done through email, Whatsapp, Facebook and face-to-face. The face-to-face method involved a discussion with the respondent about what the study entailed and the need for their participation. This was followed by either an email or Whatsapp message containing the web link to the survey to be completed

on their computer or mobile device via their web browser. The purpose of the study, the context, and how their participation would benefit the study was explained. The researcher also explained that the responses are confidential, that their participation is anonymous, and the use of the findings was also explained. They were advised that the research results would be available to them should they wish. A total of 231 links to the survey were sent directly to potential respondents by the researcher. The link to the survey was also further forwarded to potential respondents using the snowball sampling technique.

Using social media and snowball sampling to distribute the survey meant that there was a possibility of the survey going to respondents outside the population and creating invalid data in the sample. In addition, there was the risk of respondents doing the survey multiple times. This risk was mitigated through the electronic questionnaire being distributed through a unique link that only allowed the respondent to complete the survey once. SurveyMonkey also provides live dashboards of the open survey and the researcher was able to track the number of invalid samples by examining the demographic data each day ensuring that a large enough sample of valid responses was collected before closing the survey.

4.7 Analysis approach

To be able to draw conclusions from the research, the data collected was analysed and findings reported. Numeric data was analysed from the results of the questionnaire because the Likert scales illustrates the data in interval format (Saunders & Lewis, 2018).

Once the data was collected, it was summarised using excel tables and graphic functionality, inspected for any invalid entries for potential deletion and exported to the Statistical Package for Social Sciences (SPSS). The dataset was then tested for validity using KMO and Bartlett's test and exploratory factor analysis. It was tested for internal consistency by determining the Cronbach's Alpha. Descriptive statistics for each item in the research instrument was determined and analysed, averages for each construct were then calculated to perform the statistical testing required for this study.

Inter-item correlations were performed for each demographic variable. Correlation analysis was performed to determine whether relationships exist between cognitive diversity, transformational leadership and team performance. Correlation is also a pre-requisite for determining whether further regression analysis can be performed. To determine whether cognitive diversity predicts perceptions of team performance, whether transformational leadership predicts team performance and whether transformational leadership moderates the relationship between cognitive diversity and team performance, multiple regression analysis was performed. This statistical analysis enables predictions of a dependent variable from multiple independent variables. Here the moderator (transformational leadership) is the second independent variable. Microsoft Excel and SPSS were suitable tools used for the analysis of the data (Saunders, Lewis, & Thornhill, 2012).

Multiple regression analysis can be used both for explaining or predicting relationships (Kelly and Maxwell, 2010). In this study, multiple regression is used for both purposes. The purpose of the multiple regression model is to show relation between a set of regressor (independent) variables to an outcome variable. The assumptions that are required to be met for standard regression models is the reliance on ordinary least squares (OLS) to estimate the model parameters. The OLS regression coefficients in multiple regression reduce the sum of squared deviations between the model's implied and observed scores (regression coefficients). Estimation of the regression coefficients doesn't require any parametric assumptions, however inferences from coefficient estimates do depend on assumptions. Specifically, the p-values and confidence intervals for coefficient estimates from the regression model rely on four statistical assumptions; (1) normal distribution of the errors, (2) homogenous error variance across all values of the regressors/independent variables, (3) independent observations and (4) the relationship between the Y (outcome) and the K (regressor) variables in the model is linear. The last assumption of linearity is of particular importance to the study because if it is not present, it may not be appropriate for inferences (Kelly and Maxwell, 2010)

4.7.1 Summarising the data

Data collected from the survey was extracted and exported to Microsoft excel. The responses per question were then summarised in the table. A response rate was calculated and the researcher computed the number of responses per question. Answers based on the Likert scale were allocated a numerical value as described in section 4.5.1. An example of this is where respondents answered “To a very small extent” was allocated a (1) and “To a very large extent” was allocated a (5), similarly when the respondent answered “Strongly disagree” it was allocated a (1) and “Strongly agree” was allocated a (5).

Data was grouped according to the demographic variables to understand profiles and variety in the sampled respondents. For question TP3_B13, where the question is phrased in a negative manner towards the measurement of team performance, the coding was performed in reverse order so a “Strongly disagree” response was allocated as a (5). Presence of bias in the sample was addressed through computing a frequency table of all the demographic groups in the sample to determine whether any unfair representation of a group is inherent in the data. The summarised table of data was then exported to SPSS for further statistical analysis.

4.7.2 Validity of the sample data and constructs

KMO and Bartlett’s test for sphericity was performed to determine sampling adequacy and exploratory factor analysis in SPSS was performed to determine validity of the constructs. According to Hair, Babin, Money, and Samouel (2003), factor analysis assists researchers in summarising a large number of variables into a much smaller number of groups or factors. Section 4.5 describes the items in each measured construct in the research instrument; cognitive diversity is a 4-item scale, team performance is a 7-item scale and transformational leadership is a 21-item scale. Data was therefore collected for 32 variables in this study. The factor analysis statistical technique assisted the researcher in understanding which variables belong together as covariate groupings or factors. The emergent groups/factors were compared to the construct scales developed and tested in previous research studies to confirm validity of the constructs.

Factor analysis determines the covariation amongst a set of observed variables as a function of a latent construct not directly observable). The purpose of a factor analysis is to assist the researcher to identify and understand the nature of the latent constructs which are the subject of the study. There are two types of factor analysis; exploratory factor analysis (EFA) and confirmatory factor analysis (CFA). The purpose of EFA models is to identify latent constructs or to generate hypotheses about their possible structures. As the name suggests, EFA is an exploratory test in nature and generally used when the variables making up a construct have not been studied previously and are therefore a hypothesised set of variables determined from existing research. This exploratory process of variable formulation does not determine a fixed number of variables and uses the EFA to understand the relationships between the variables within a construct. Once the EFA has been performed to test the variables in a new scale, CFA would be used to validate the factor structure in a different sample. The purpose of the CFA is to gain a better understanding of the latent constructs under study and evaluate their structures (Bandalos and Finney,s 2010). In applying the process to this study, because the scales used to determine cognitive diversity, team performance and transformational leadership have been hypothesised and validated in previous studies, the most appropriate test for validity in this study would be to perform a CFA. CFA uses structured equation modelling to determine validity of the variables within a construct. It is suggested that to perform this test, a generally accepted sample would be 10 per variable in each scale (Schreiber, Stage, King, Nora, and Barlow, 2006). As mentioned above there were 32 variables in this study, therefore the required sample size would be 320. This was not achievable in the study due to time constraints, therefore the EFA test is the more appropriate test for validity. Bandalos and Finney (2010) suggest that a minimum sample of 100 is necessary for an EFA.

4.7.3 Reliability of the instrument

A survey research instrument is reliable if the results of its repeated use in research studies results in consistent scores. It relies on the definition of constructs that are measured being used consistently across all applications. A multi item scale measuring a construct is considered reliable when the items within the scale are

correlated; the stronger the correlation the more reliable the scale. For this study internal consistency reliability testing was used. The test sums the items in the scale to get a total score for each construct. Split halves test in the form of Cronbach's Alpha was calculated (this test is where halves of the summated items in a construct are tested to determine their degree of correlation). The test calculates the average of coefficients of all the possible split halves. The test provides a value between 0 to 1. The general rule of thumb is to accept an alpha of 0.7 as a minimum. The test was able determine how consistent responses are to questions measuring specific constructs in the study (Hair, Babin, Money, and Samouel, 2003).

4.7.4 Descriptive Statistics for the observable variables

Each Likert scale question was used to derive data for the study which was analysed using descriptive statistics (Saunders et al., 2012). Descriptive statistics was performed for each question in the survey to understand the responses. It included the following:

- The mean score – this assists the researcher in understanding on average how the respondents answered a question as it represents the central tendency (Hair et al., 2003)
- The minimum and the maximum score – this is used to determine the range of the responses to the question. It is useful to the researcher to understand a complete picture of a sample distribution (Hair et al., 2003)
- The standard deviation – this statistical measure assists in determining the variability of the sample distribution values from the mean and helps the researcher understand the level of agreement amongst the respondents for a specific question (Hair et al., 2003).

An example would be if, for instance, question CD1_B7 in the survey that asked "To what extent do the member in your team differ on way of thinking", all respondents answered "To a very large extent"; the minimum and maximum values would be 5 and range would be zero. Further to this, the mean would also be 5 and the standard deviation would be zero.

The scores for each question measuring a construct were then added and the average calculated to represent the mean score within the construct - meaning, where the mean values for each of the seven questions measuring team performance, for instance, was summed and divided by the number of questions (being 7).

Team performance mean = (TP1_B11 mean + TP2_B12 mean + TP3_B13 mean + TP4_B14 mean + TP5_B15 mean + TP6_B16 mean + TP7_B17 mean) /7

The scores calculated per construct were used to further unpack the mean, minimum, maximum and standard deviation of the respondents per construct.

4.7.5 Mean scores comparison across subgroups

The researcher compared the mean scores for each demographic subgroup to control for the influence of demographic variables. To understand the variation in responses across the different demographic groups, the mean scores for each demographic group per construct was compared. For male and female responses, the means were compared using a t-test. This test is appropriate when the researcher wishes to compare the means for variables associated with two independent samples (in this case male and female groups). The test determined whether there is a significant difference between the means of the two sample groups when the p-value is less than 0.05 at a 95% confidence interval (Hair et al., 2003)

For the remaining demographic groups where there are more that two categories within the group, the analysis of variance test (ANOVA) using F-distribution was performed. This included the age, industry, years of service, and job levels. Should the p-value be lower than 0.05 at a 95% level of confidence, the means of the sample groups have significantly different means(Hair et al., 2003).

4.7.6 Measuring relationships between the variables and testing the hypothesis

As mentioned above, to test the relationships between the variables and test the hypothesis, correlation and regression analysis in SPSS was performed. Correlation and regression assists the researcher in determining whether there is a “consistent

and systematic relationship between two or more variables" (Hair et al., 2003, p.280). Four dimensions are discussed in the results (Chapter five) for each test, namely whether there is a relationship presence based on statistical significance, the nature of the relationship (i.e. linear or non-linear), the direction of the relationship (positive or negative) and the strength of the association (slight to very strong) (Hair et al., 2003).

To understand the relationship between each construct with each of the other constructs a Pearson's r correlation was performed. Pearson's correlation measures a linear association between two metric variables; the output from the test is a correlation coefficient which is a number ranging between -1.00 and +1.00, with a zero representing no association between the two variables. A value close to -1.00 indicates a strong negative relationship whilst a value closer to +1.00 indicates a strong positive relationship. If the value is close to zero, then there is a weak association and the linearity of the relationship is poor. A significance level of p=0.01 was used for the test (Hair et al., 2003). Correlation was performed to provide the researcher with base knowledge on whether a relationship exists and the strength of the relationship, however the test does not provide information to examine and predict relationships between constructs. Regression analysis would provide this deeper insight.

For testing the three hypotheses, linear and multiple regression tests were performed. To test hypothesis 1 and 2, where a positive relationship was expected to exist between perceived cognitive diversity in teams and the team's performance as well as the expected positive relationship between transformational leadership and team performance, bivariate regression was performed. This test indicates to the researcher the linear equation between a single metric dependent variable and another single metric independent variable (Hair et al., 2003).

To test hypothesis 3, where a positive relationship was expected to exist between perceived cognitive diversity in teams and the team's performance moderated by transformational leadership, multiple regression was performed. This regression test allows for several independent variables to be entered into a linear equation to predict a single dependent variable (Hair et al., 2003). In this test, cognitive diversity and the

moderator are independent variables and team performance is the dependent variable. To test the moderator as the second independent variable in the analysis, the cognitive diversity score and transformational leadership score was multiplied to determine the moderator score. Moderation was determined to have occurred when there is a percentage increase in the variation explained by adding the new construct to the existing relationship between cognitive diversity and team performance.

A statistical significance test is performed on the regression analysis. This is to determine the probability of the results being due to chance and the level of significance applied was 0.05. Therefore, the test is statistically significant if the probability is less than the significance value of 0.05 (Hair et al., 2003).

4.8 Limitations

Due the study being purposive in nature and a non-probability sampling method was used to choose research participants, the sample selection is not random. Part of the population therefore was not able to be selected due to access being limited. There is a geographic limitation on the study as the population is defined within the borders of South Africa, however the researcher only has access to participants in the Gauteng area.

A language limitation also may exist as the questionnaire is written in English. As there was a risk that some questions may be interpreted and answered incorrectly, the researcher aimed to identify participants in the sample who are able to understand the language and answer appropriately. A static view is determined as the result of this study, because a cross-sectional, self-administered survey at a specific point in time was the primary research tool used. One of the drawbacks of this method is that a respondents' circumstances at that time point can influence the results. For example, if a respondent had been negatively impacted by a current leadership or HR decision he/she may have had a negative attitude towards the effect of these variables regarding cognitive diversity or transformational leadership in the team.

A disadvantage of using an online questionnaire to perform the survey means that the questions would not be in enough detail to be able to offer explanatory relationships between the variables under investigation. The questionnaire design needed to be comprehensive and precise to be able to answer the research question appropriately. This also means that there were a limited number of questions that could be asked and follow-on questions which may assist the researcher gain a deeper understanding of the nature of the interrelatedness of the variables cannot be asked.

The participation of the targeted sample is difficult to control by the researcher as there was limited direct contact. There were also challenges in ensuring good response rates - consequently the researcher may not have been able to obtain a sample which represents the complete target population.

5. RESEARCH RESULTS

5.1 Introduction

This chapter will present the findings of the respondents to the online survey. The presentation of the results is required to answer the research hypothesis in Chapter three. Firstly, the response rates to the survey questions and demographic information is described. The descriptive statistics for the sample are presented which help explain the composition of the data. The validity and reliability procedures and results are then presented, followed by the results of the statistical tests performed to understand the various relationships in the data.

5.2 Survey response summary

As mentioned in chapter four, various methods were adopted to collect responses to the online survey. This included sharing the unique SurveyMonkey link through convenience and through snowball sampling. The survey was open for 1 month, from the 17th of August 2019 to the 15th of September 2019. In total 158 responses were received, with a 100% completion rate as all questions were answered. Appendix B presents the frequency tables for each question based on the Likert scale responses.

5.3 Demographic composition of the sample

The target population consists of three categories of job level in a company, namely senior and middle managers as well as professionals working in companies in South Africa. For a valid response to be included in the sample data, the respondent had to choose one of three job categories. These three options, along with a fourth “other” option were available in the electronic survey. If the respondent chose “other”, they were prompted to enter their job level. From this data the researcher was able to analyse this category and allocate the responses to either one of the three job levels should the respondent not interpret the question correctly or remove the response from further statistical testing due to it not being valid. Of the 158 responses, 14 responses fell within the “other” category. 7 respondents entered “Director”, “Executive” or “Leadership” and accordingly the responses were allocated to senior management. One respondent entered, “specialist” which was allocated to the professional category and one respondent entered “Team lead” which was allocated to the middle

management category. Five responses were removed from the sample data due to them being an invalid representation of the target population. The total sample for purpose of this study is therefore 153 responses. Of the 153 respondents in the sample 51 (33%) were professionals, 56 (37%) were middle managers and 46 (30%) were senior managers. This composition is represented graphically in Figure 3.

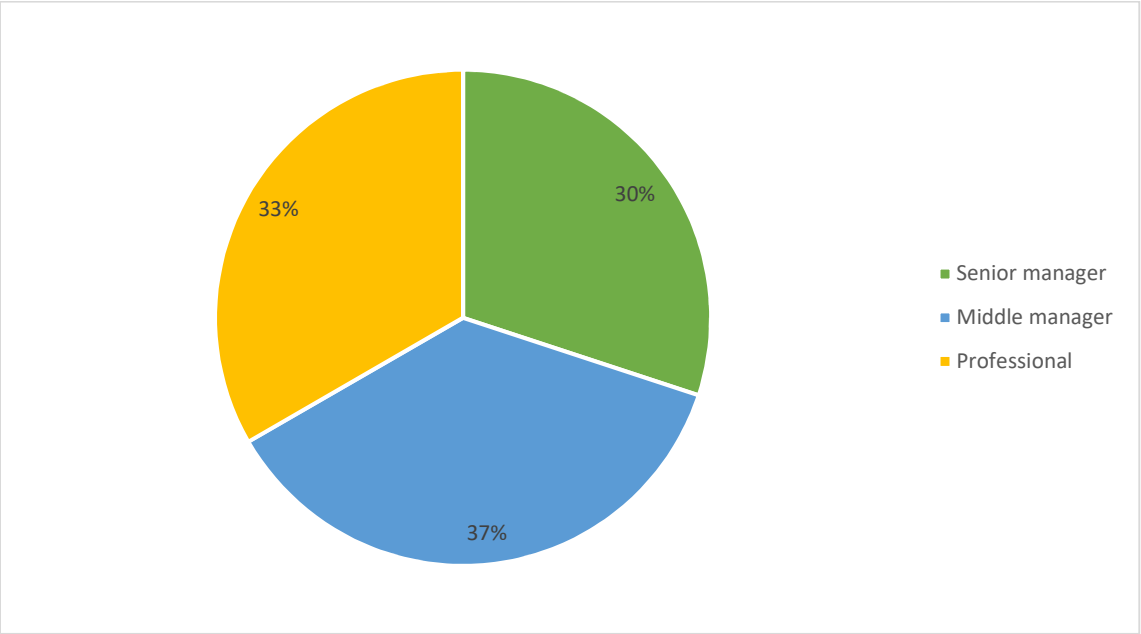

Figure 3: Composition of sample demographic based on job level

The industry representation was summarised and is presented in table 5. The composition shows the highest concentration of respondents falling within the "Other" category, representing 44 (29%) of the 153 samples. If a respondent chose this category whilst completing the survey they were prompted to enter their industry. Upon further analysis into this category 36 of the 44 noted their industry as media or entertainment broadcasting. This is due to the researcher working for a large South African media broadcasting organisation and having used her network within the company to collect responses. The second highest group of respondents were from the telecommunications industry with 27 (18%) followed by the financial services industry with 25 (16%). Statistical tests are performed below in section 5.7 to determine variability in responses based on the industry differences in the sample.

Table 5: Respondents from different industries

Answer options	Frequency	Percentage
Manufacturing	5	3%
Information technology	19	12%
Education	3	2%
Financial services	25	16%
Mining	1	1%
Telecommunications	27	18%
Professional services	15	10%
Healthcare	5	3%
Energy and utilities	2	1%
Retail	4	3%
Government	3	2%
Other	44	29%
Total Sample	**153**	
Missing information	**0**	

The gender representation in the sample of 153 respondents was 87 (57%) male and 66 (43%) female. This slightly higher proportion of males in the sample is not indicative of an imbalanced gender representation. Figure 4 shows the gender representation of the sample graphically. The age representation of the sample shown graphically as Figure 5 shows 21 (14%) respondents between the ages of 21-19, 87 respondents (57%) between the ages of 30-39, 35 respondents (23%) between the ages of 40-49, 8 (5%) respondents between 50-59 and only 1 (> 1%) respondent over the age of 60.

To ensure that there was variety in the sample, demographic information was requested from the respondents to analyse the highest level of education and numbers of years of service to the organisation. Statistical tests below in section 5.7 were performed to determine whether there was any variability in responses based on the demographic measures. Figures 6 and 7 show the percentage representation of highest level of education and percentage representation of years of service at current company respectively.

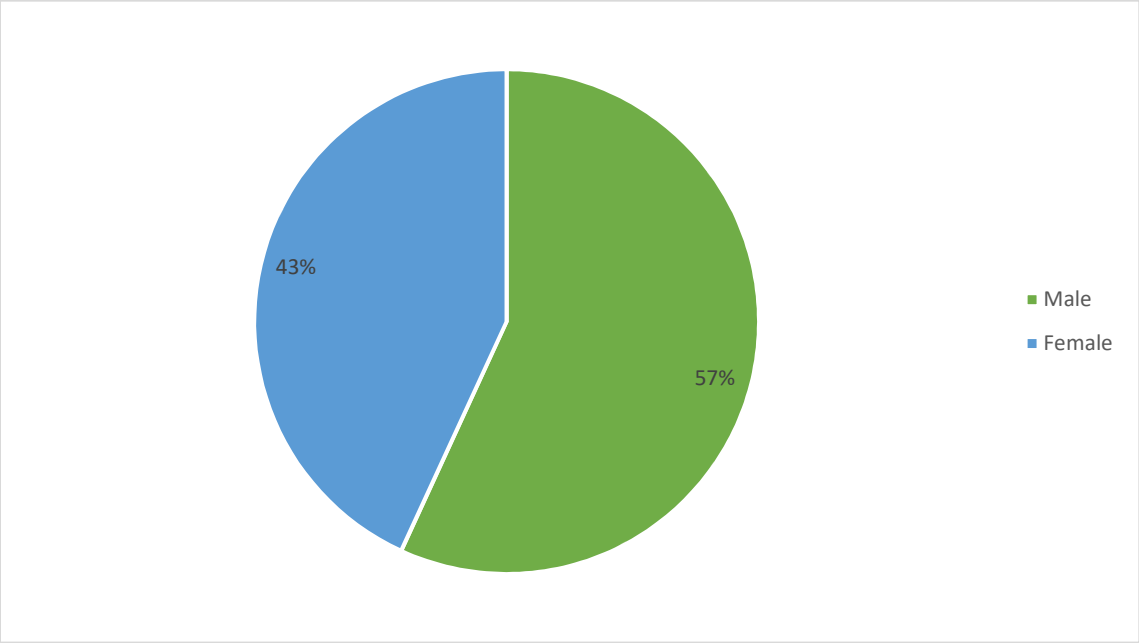

Figure 4: Composition of sample demographic based on gender

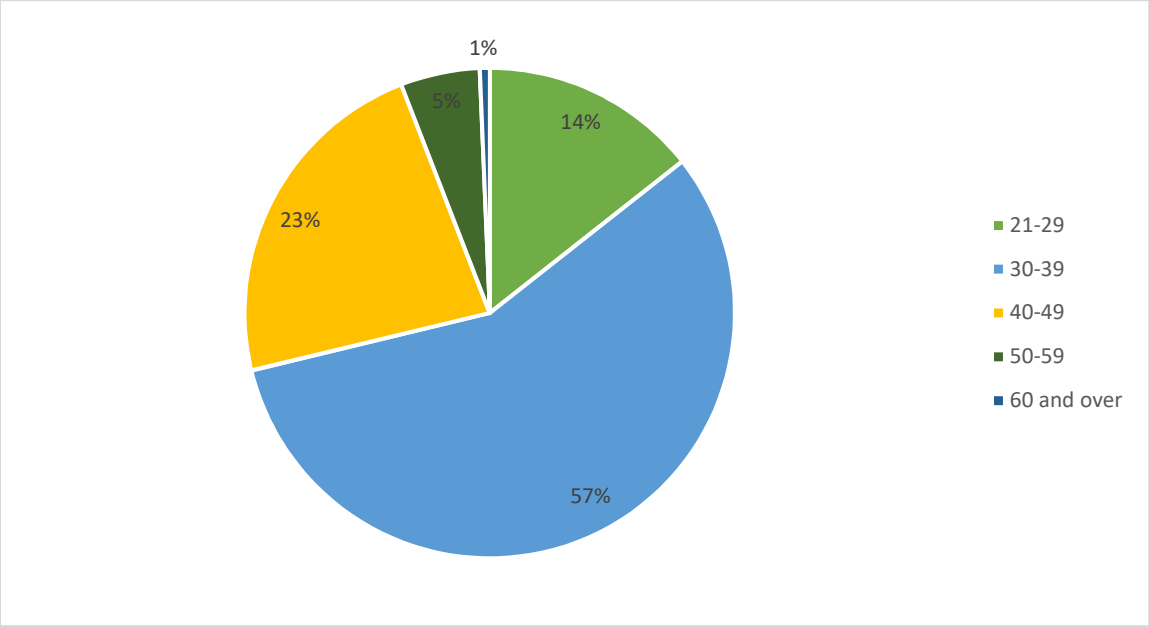

Figure 5: Composition of sample demographic based on age

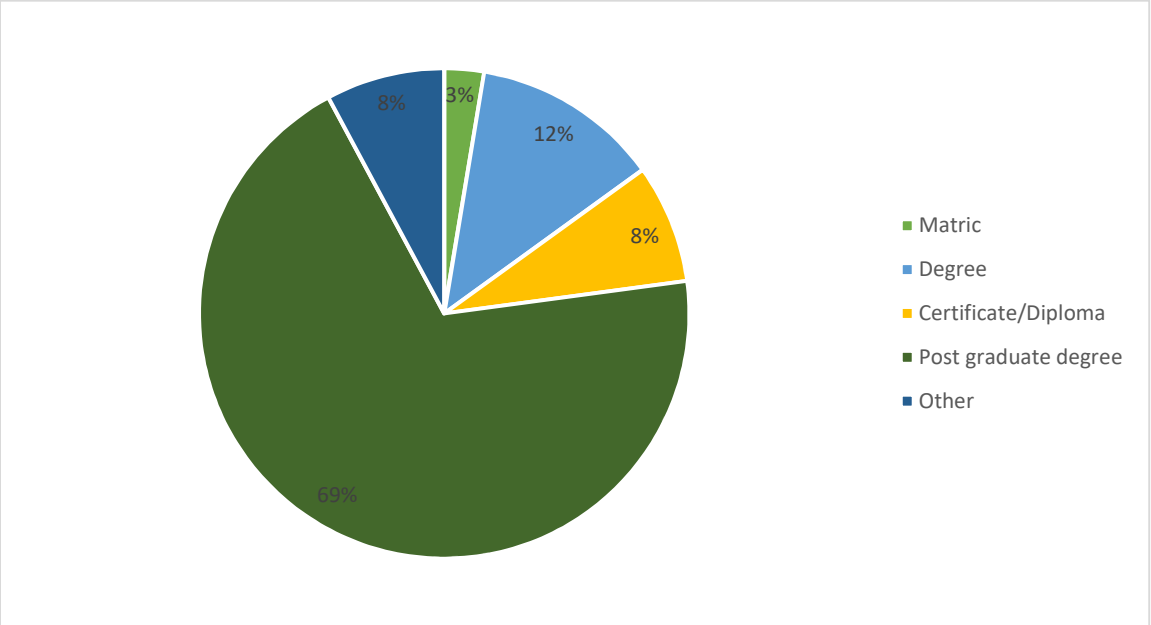

Figure 6: Composition of sample demographic based on highest level of education completed

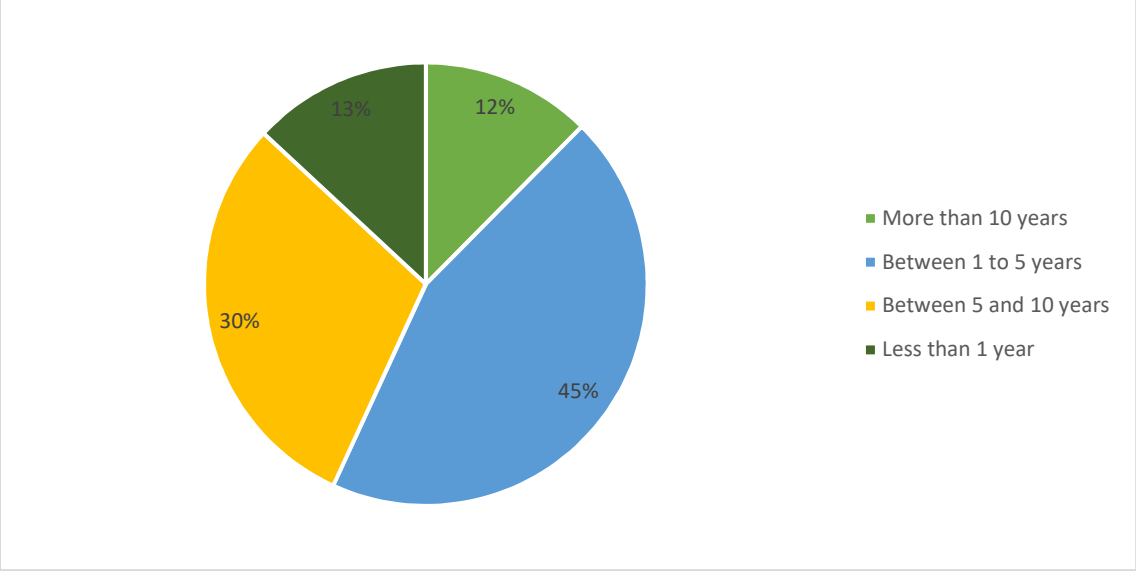

Figure 7: Composition of sample based on number of years of service at current company

5.4 Construct validity

The data collected is required to first be tested for validity before any statistical tests can be performed. Each construct within the research hypothesis is tested for validity using exploratory factor analysis. The Kaiser Meyer Olkin (KMO) and Bartlett's test for sphericity was used to assist the researcher in concluding whether the exploratory factor analysis is the appropriate test for validity.

5.4.1 KMO and Bartlett's test for sphericity

The result of the KMO test for determining sampling adequacy is 0.905, which indicates that the sample is suitable to perform factor analysis as it is higher than the recommended 0.6. The Bartlett's test for Sphericity shows p=0.000 which is less than the significance level of p<0.05. Both these results indicate the data can be used to perform factor analysis and provide useful outcomes.

Table 6: KMO and Bartlett's test results

Kaiser-Meyer-Olkin Measure of Sampling Adequacy.		0.905
Bartlett's Test of Sphericity	Approx. Chi-Square	3633.855
	df	496
	Sig.	0.000

The anti-image correlation matrix was also examined as part of the test output. This assists in determining if the sample is adequate per variable. The diagonal values were greater than the generally accepted 0.4, with the lowest value being 0.479. Twenty-one of the values were greater than 0.9, six were between 0.8 and 0.9, one was between 0.7 and 0.8, two were between 0.5 and 0.6 and two were between 0.4 and 0.5. There was thus no requirement to remove any variables to perform a factor analysis.

The principle axis factoring communalities table was examined, all the variables displayed values above 0.3 except for two items, CD1_B7 and CD4_B10. These two

variables had anti image correlation diagonal values of 0.589 and 0.488 respectively. This test assisted the researcher in understanding the extent to which a variable correlates with all other items. The higher the result the more favourable. Of the 32 items in the table, 2 variables had values between 0.2 and 0.3, 1 had a value between 0.3 and 0.4, 4 variables had values between 0.4 and 0.5, 5 variables had values between 0.5 and 0.6, 10 variables had values between 0.6 and 0.7, 9 had values between 0.7 and 0.8 and 1 variable had a value of greater than 0.8.

5.4.2 Results for Exploratory factor analysis

As discussed in section 4.7.2, to determine validity of the constructs, factor analysis was argued to be most appropriate approach. Both exploratory and confirmatory factor analysis were considered and it was concluded that exploratory factor analysis (EFA) would be performed for construct validity even though confirmatory factor analysis (CFA) is the most appropriate test. This is due to the time constraints of this study (CFA requires a large sample of 320 for structured equation modelling whereas EFA requires a minimum of 100).

The results of the factor analysis test in SPSS identified six factors which were contrary to the researcher's expectation of identifying three factors, each loading the items within the cognitive diversity, team performance and transformational leadership scales. The researcher ran a principle axis factoring factor analysis with varimax rotation method. The variables were then loaded to the specific factor where they had their highest coefficient on the matrix. A weak association presents itself as a lower coefficient which is closer to zero, and a high coefficient closer to 1 was associated with a strong association (Hair et al., 2003). The guidelines for business researchers for important factor loadings are coefficients higher than 0.3, which are considered acceptable; coefficients greater than 0.5 are moderately important; and coefficients greater than 0.7 are highly important (Hair et al., 2003). Table 7 depicts each of the variables with the value of strongest associated coefficient allocated to one of the 6 factors from the test.

Factor 1 contains 9 of the variables presented in the scale measuring transformational leadership as discussed in section 4.5.1.3. All the coefficients contain values greater than 0.5 which is acceptable as moderately important. These 9 items would be expected to be associated with one another as they represent three of the six dimensions of transformational leadership discussed in Chapter two. These dimensions include; providing an appropriate model (items TL6_B23, TL7_B24 and TL8_B25), encouraging the acceptance of group goals (items TL9_B26, TL10_B27, TL11_B28 and TL12_B29) and providing individualised support (items TL16_B33 and TL17_B34) (Zhang et al., 2011).

Factor 2 contains 8 of the variables also presented in the scale measuring transformational leadership discussed in section 4.5.1.3. All the coefficients contain values greater than 0.5 which is acceptable as moderately important. These 8 items would be expected to be associated with one another as they represent two of the six dimensions of transformational leadership discussed in Chapter two, these dimensions include; identifying and articulating a vision (items TL2_B19, TL3_B20, TL4_B21 and TL5_B22), and intellectual stimulation (items TL18_B35, TL19_B36, TL20_B37 and TL21_B38) (Zhang et al., 2011).

Factor 3 contains 6 variables consisting of items; 5 from the team performance scale in section 4.5.1.2 and 1 from the transformational leadership scale in section 4.5.1.3. The team performance items all have a similar characteristic in that they represent the non-financial team performance indicators. It would also be expected that the one transformational leadership item, “TL1_B18_My team leader has a clear understanding of where we are going”, would be associated with team performance as this represents part of the identification of the team vision dimension of transformational leadership. The result would be team performance outcomes (Zhang et al., 2011). It should also be noted that items TP3_B13, TP5_B15 and TL1_B18 had factors less than 0.5, however these items are recommended to be discarded only if they are less than 0.3 (Basto & Pereira, 2012). In this case no items would be required to be discarded.

Factor 4 contains 3 variables, also presented in the scale measuring transformational leadership discussed in section 4.5.1.3. All the coefficients contain values greater than

0.5 which is acceptable as moderately important. These 3 items would be expected to be associated with one another as they represent a single dimension of transformational leadership discussed in Chapter two, namely the expectation of high performance (Zhang et al., 2011).

Factor 5 contains 2 variables, both of which represent the two financial team performance items in the team performance construct scale discussed in section 4.5.1.2, therefore they would be expected to be associated with one another. Both items are greater than 0.6 which indicates that they are moderately important.

Factor 6 contains 4 variables, all of which make up the cognitive diversity scale discussed in section 4.5.1.1. It would be expected that they are associated with one another. Two items are lower than 0.5 but higher than 0.3 therefore will not be discarded and two items are greater than 0.5 indicating moderate importance.

The researcher's expectation of the factor analysis results is that there would ideally be 3 factors loaded in the sample and the three factors would contain all the items in each of the three scales measuring cognitive diversity, team performance and transformational leadership. One of the factors would be the 4 items making up the cognitive diversity scale. This was observed in the dataset, presenting itself as factor 6. The second would be the 7 items making up the team performance scale. However these 7 items were split out over factor 3 (five items) and factor 5 (two items). The last factor would ideally have consisted of the 21 items measuring transformational leadership. The items in this scale presented themselves over factors 1 through 4 (factor 1: 9 items, factor 2: 8 items, factor 3: 1 item, and factor 4: 3 items). This was expected for transformational leadership as the scale measures six different dimensions within the construct; determining and communicating a vision, being an appropriate role model, encouraging group goal acceptance, high performance expectation, providing personalised support, and intellectual stimulation (Zhang et al., 2011). The researcher can therefore conclude that the factors did not load as expected in the dataset and this is possibly due to the size of the sample.

Table 7: Exploratory factor analysis test results

Item	1	2	3	4	5	6
TL6_B23_My team leader leads by 'doing', rather than simply by 'telling'	0.62928					
TL7_B24_My team leader provides a good model for me to follow.	0.66565					
TL8_B25_My team leader leads by example	0.74945					
TL9_B26_My team leader fosters collaboration among work groups	0.6459					
TL10_B27_My team leader encourages employees to be 'team players'	0.67476					
TL11_B28_My team leader gets the group to work together for the same goal	0.69144					
TL12_B29_My team leader develops a team attitude and spirit among employees	0.56154					
TL16_B33_My team leader shows respect for my personal feelings	0.67513					
TL17_B34_My team leader behaves in a manner thoughtful of my personal needs	0.66447					
TL2_B19_My team leader paints an interesting picture of the future for our group		0.54307				
TL3_B20_My team leader is always seeking new opportunities for the organization		0.57775				
TL4_B21_My team leader inspires others with his/her plans for the future		0.59655				
TL5_B22_My team leader is able to get others committed to his/her dream		0.55063				
TL18_B35_My team leader challenges me to think about old problems in new ways		0.66506				
TL19_B36_My team leader asks questions that prompt me to think		0.71141				
TL20_B37_My team leader has stimulated me to rethink the way I do things		0.69618				
TL21_B38_My team leader has ideas that have challenged me to re-examine some of my basic assumptions about my work		0.70578				

Table 7 continued: Exploratory factor analysis test results

Item	1	2	3	4	5	6
TP3_B13_Under the team's leadership the unit is slow in expanding major business			0.38875			
TP4_B14_Under the team's leadership the unit builds good relationships with stakeholders			0.52811			
TP5_B15_Under the team's leadership the unit enjoys good reputation in the local region			0.47768			
TP6_B16_Under the team's leadership the unit has high employee satisfaction			0.69994			
TP7_B17_Under the team's leadership the unit has high employee morale			0.79618			
TL1_B18_My team leader has a clear understanding of where we are going			0.48672			
TL13_B30_My team leader shows us that he/she expects a lot from us				0.51336		
TL14_B31_My team leader insists on only the best performance				0.87191		
TL15_B32_My team leader will not settle for second best				0.82446		
TP1_B11_Under the team's leadership the unit has rapid revenue growth					0.60056	
TP2_B12_Under the team's leadership the unit has rapid profit growth or cost savings growth (if unit is a cost centre)					0.66752	
CD1_B7_To what extent do the members of your team differ on way of thinking						0.65675
CD2_B8_To what extent do the members of your team differ on composition of knowledge and skills						0.49836
CD3_B9_To what extent do the members of your team differ on views on the world						0.64367
CD4_B10_To what extent do the members of your team differ on beliefs on what is considered right or wrong						0.41356

5.5 Instrument reliability results

To determine whether the research instrument used was reliable, a Cronbach's Alpha test was performed for each construct. The results for each scale measuring a specific construct are presented in the sub sections below. It shows that overall the instrument is reliable because each Cronbach coefficient value was greater than 0.60.

5.5.1 Cognitive diversity Cronbach alpha results

The Cronbach's alpha test performed for the items in the cognitive diversity scale showed a result of 0.622 which is acceptable at a moderate level of strength of association - however it is not the ideal range (Hair et al., 2003). Table 8 presents the various reliability results should an item in the scale be removed. The removal of any one of the four items would not yield a better result and would lead to a decrease in internal consistency, therefore all items in the scale were used in the sample for tests that include the cognitive diversity construct. The item's total correlation scores are all above 0.3, which indicates moderate to strong correlations between items in the scale and further indicates that all the items belong within the scale.

Table 8: Reliability test results for cognitive diversity

Cronbach's Alpha	N of items
0.622	4

	Scale Mean if Item Deleted	Scale Variance if Item Deleted	Corrected Item-Total Correlation	Squared Multiple Correlation	Cronbach's Alpha if Item Deleted
CD1_B7	9.20	3.886	0.425	0.251	0.540
CD2_B8	9.32	3.785	0.364	0.155	0.580
CD3_B9	9.02	3.506	0.511	0.292	0.475
CD4_B10	9.99	3.526	0.334	0.158	0.615

5.5.2 Team performance Cronbach alpha results

Cronbach's alpha test, performed for the items in the team performance scale, showed a result of 0.845 which is greater than the generally accepted rule of thumb value of 0.7, which indicates a good level of strength of association (Hair et al., 2003). Table 9 presents the various reliability results should an item in the scale be removed. The

removal of any one of the seven items would not yield a better result, therefore all items in the scale were used in the sample for tests that include the team performance construct.

Table 9: Reliability test results for team performance

Cronbach's Alpha	N of items
0.845	7

	Scale Mean if Item Deleted	Scale Variance if Item Deleted	Corrected Item-Total Correlation	Squared Multiple Correlation	Cronbach's Alpha if Item Deleted
TP1_B11	21.16	18.177	0.569	0.492	0.828
TP2_B12	21.01	18.757	0.485	0.415	0.839
TP3_B13	21.38	17.645	0.551	0.327	0.831
TP4_B14	20.44	18.893	0.549	0.389	0.831
TP5_B15	20.58	18.088	0.589	0.415	0.825
TP6_B16	21.25	15.770	0.753	0.796	0.797
TP7_B17	21.20	15.764	0.715	0.780	0.804

5.5.3 Transformational leadership Cronbach alpha results

Cronbach's alpha test, performed for the items in the transformational leadership scale, showed a result of 0.956. This is indicative of an excellent strength of association as it is higher than 0.9 (Hair et al., 2003). Inspection of the table showing the coefficient values of each of the items are removed. Two items would yield a slightly higher result, namely TL15_B32 and TL14_B31, which will result in 0.959 and 0.957 respectively. These items will not be removed from the scale as the coefficient is already in the highest percentile range and will not significantly influence the results of the statistical testing for this construct.

Table 10: Reliability test results for transformational leadership

Cronbach's Alpha	N of items
0.956	21

	Scale Mean if Item Deleted	Scale Variance if Item Deleted	Corrected Item-Total Correlation	Squared Multiple Correlation	Cronbach's Alpha if Item Deleted
TL1_B18	75.27	197.227	0.692	0.686	0.954
TL2_B19	75.36	198.442	0.686	0.680	0.955
TL3_B20	75.29	198.180	0.614	0.573	0.955
TL4_B21	75.52	193.027	0.792	0.760	0.953
TL5_B22	75.54	193.302	0.803	0.755	0.953
TL6_B23	75.56	191.945	0.752	0.715	0.954
TL7_B24	75.51	191.554	0.804	0.788	0.953
TL8_B25	75.35	194.399	0.723	0.766	0.954
TL9_B26	75.33	198.432	0.696	0.654	0.954
TL10_B27	75.12	199.749	0.692	0.676	0.955
TL11_B28	75.23	197.546	0.781	0.766	0.954
TL12_B29	75.46	194.710	0.788	0.746	0.953
TL13_B30	75.11	200.192	0.597	0.542	0.956
TL14_B31	75.12	202.512	0.499	0.689	0.957
TL15_B32	75.39	205.133	0.348	0.657	0.959
TL16_B33	75.39	194.977	0.694	0.727	0.954
TL17_B34	75.32	195.890	0.674	0.732	0.955
TL18_B35	75.37	192.577	0.786	0.738	0.953
TL19_B36	75.30	192.422	0.792	0.810	0.953
TL20_B37	75.39	192.543	0.817	0.822	0.953
TL21_B38	75.42	197.220	0.675	0.699	0.955

5.6 Summary of descriptive statistics

Descriptive statistics were performed for each statement making up the construct. Each construct is presented under its own sub section below. Using descriptive statistics, the average was calculated for the questions in each construct. As the survey had a 100% response rate the number of responses depicted as the “Valid N” for all tests will be the total valid sample of 153 determined in section 5.3 above.

5.6.1 Cognitive diversity scores

Cognitive diversity was measured using 4 questions, each with a 5-point Likert scale measuring the extent to which perceived cognitive diversity exists within the respondent's team. A very small extent was allocated a 1 and a very large extent was allocated a 5 in the dataset. The frequency table for each question is shown in appendix B. For three of the four questions, most responses agreed with each statement describing the perceived presence of an element in the definition of cognitive diversity. The overall mean score for the construct, depicted in table 11, showed that on average the respondents perceived cognitive diversity in their teams to a moderate extent (M = 3.13 and SD = 0.602). The minimum score is 1.75 which is higher than the lowest scoring item on the scale which is "to a very small extent".

The histogram (figure 8) for cognitive diversity illustrates that the modal value for the construct is 3 which is a moderate extent of perceived cognitive diversity in the team. This also indicates that the mean value of 3.13 is fair and the standard deviation of 0.0602 illustrates, along with the histogram shape, that the responses are not too dispersed around the mean.

Table 11: Descriptive statistics for Cognitive diversity

	N	Minimum	Maximum	Mean	Std. Deviation
CD1_B7_To what extent do the members of your team differ on way of thinking	153	1	5	3.31	0.780
CD2_B8_To what extent do the members of your team differ on composition of knowledge and skills	153	1	5	3.19	0.879
CD3_B9_To what extent do the members of your team differ on views on the world	153	1	5	3.49	0.836
CD4_B10_To what extent do the members of your team differ on beliefs on what is considered right or wrong	153	1	5	2.52	1.007
Cognitive diversity score	153	1.75	5	3.13	0.602
Valid N (listwise)	153				

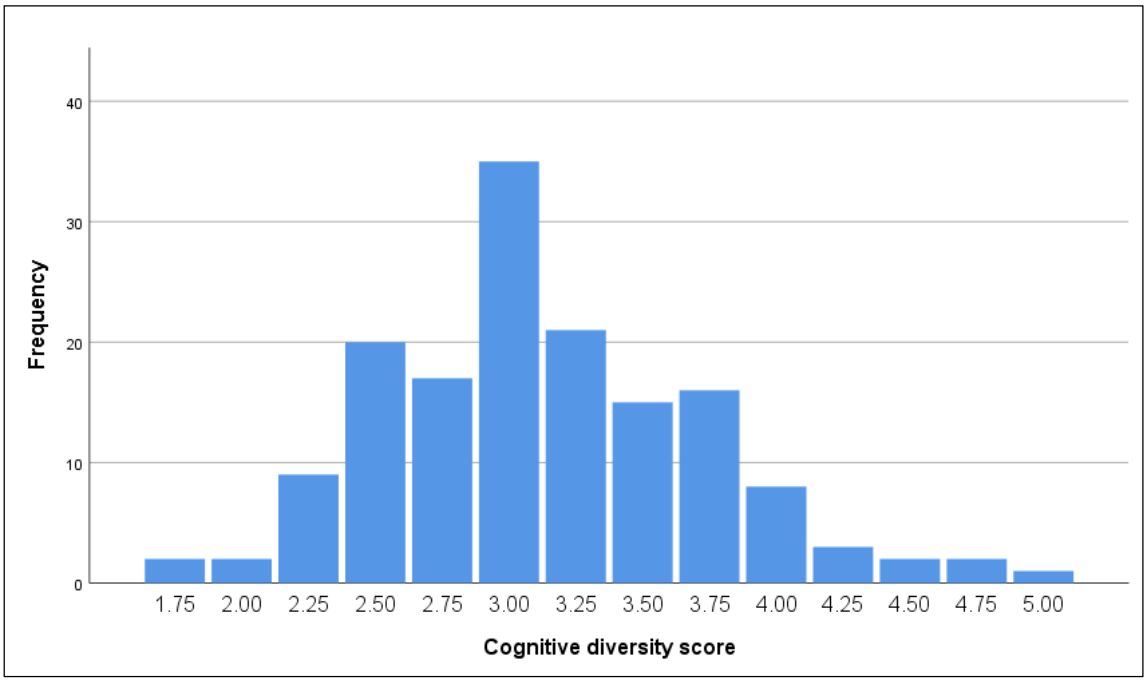

Figure 8: Cognitive diversity histogram

5.6.2 Team performance scores

Team performance was measured using 7 questions, each with a 5-point Likert scale measuring the level of agreement with certain performance criteria being met for their team. Strongly disagree was allocated a 1 and strongly agree was allocated a 5 in the dataset. The frequency table for each question is shown in appendix B. For five of the seven questions, most responses agreed with each statement describing an element of team performance. The overall mean score for the construct, depicted in table 12, showed that on average the respondents agreed that their team is performing under their current leadership (M = 3.5 and SD = 0.690). The minimum score is 1.43 which is higher than the lowest scoring item on the scale which is “strongly disagree”.

The histogram (figure 9) for team performance illustrates two modal values, namely 3.71 and 4 which describes agreement with the presence of team performance indicators. This also suggests that the mean value of 3.5 is fair and the standard deviation of 0.0690 illustrates, along with the histogram shape, that the responses are not too dispersed around the mean.

Table 12: Descriptive statistics for team performance

	N	Minimum	Maximum	Mean	Std. Deviation
TP1_B11_Under the team's leadership the unit has rapid revenue growth	153	1	5	3.34	0.897
TP2_B12_Under the team's leadership the unit has rapid profit growth or cost savings growth (if unit is a cost centre)	153	1	5	3.50	0.897
TP3_B13_Under the team's leadership the unit is slow in expanding major business	153	1	5	3.12	1.009
TP4_B14_Under the team's leadership the unit builds good relationships with stakeholders	153	1	5	4.06	0.797
TP5_B15_Under the team's leadership the unit enjoys good reputation in the local region	153	1	5	3.93	0.889
TP6_B16_Under the team's leadership the unit has high employee satisfaction	153	1	5	3.25	1.072
TP7_B17_Under the team's leadership the unit has high employee morale	153	1	5	3.31	1.114
Team performance score	153	1.43	5	3.50	0.690
Valid N (listwise)	153				

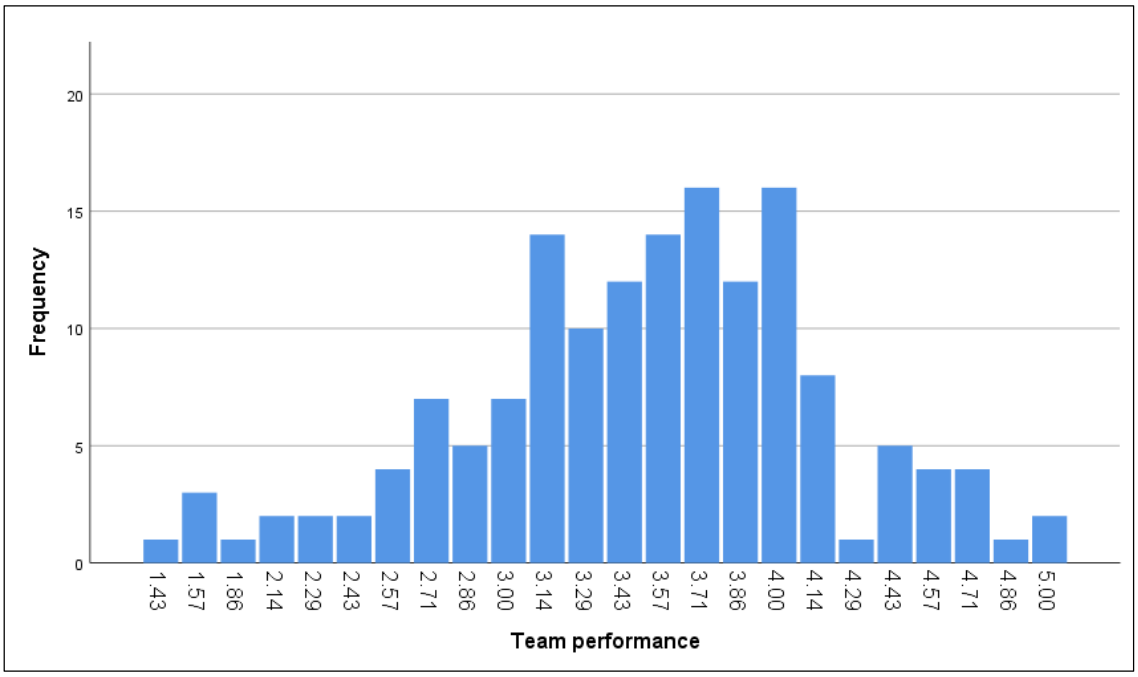

Figure 9: Team performance histogram

5.6.3 Transformational leadership scores

Transformational leadership was measured using 21 questions, each with a 5-point Likert scale measuring the level of agreement with certain performance criteria being met for their team. Strongly disagree was allocated a 1 and strongly agree was allocated a 5 in the dataset. The frequency table for each question is shown in appendix B. For all 21 questions, most responses agreed with each statement describing presence of an element of transformational leadership. The overall mean score for the construct, depicted in table 13, showed on average the respondents agreed that their leader displayed transformational leadership characteristics (M = 3.77 and SD = 0.699). The minimum score is 1.14 which is higher than the lowest scoring item on the scale which is “strongly disagree”.

The histogram (figure 10) for team performance illustrates a modal value of 4 which suggests agreement with the presence of transformational leadership. This also suggests that the mean value of 3.77 is fair and the standard deviation of 0.0699 illustrates along with the histogram shape that the responses are not too dispersed around the mean.

Table 13: Descriptive statistics for transformational leadership

	N	Minimum	Maximum	Mean	Std. Deviation
TL1_B18_My team leader has a clear understanding of where we are going	153	1	5	3.84	0.919
TL2_B19_My team leader paints an interesting picture of the future for our group	153	1	5	3.76	0.866
TL3_B20_My team leader is always seeking new opportunities for the organization	153	1	5	3.83	0.972
TL4_B21_My team leader inspires others with his/her plans for the future	153	1	5	3.59	0.996
TL5_B22_My team leader is able to get others committed to his/her dream	153	1	5	3.58	0.971
TL6_B23_My team leader leads by 'doing', rather than simply by 'telling'	153	1	5	3.56	1.094
TL7_B24_My team leader provides a good model for me to follow.	153	1	5	3.61	1.047
TL8_B25_My team leader leads by example	153	1	5	3.77	1.016
TL9_B26_My team leader fosters collaboration among work groups	153	1	5	3.79	0.856
TL10_B27_My team leader encourages employees to be 'team players'	153	1	5	4.00	0.795
TL11_B28_My team leader gets the group to work together for the same goal	153	1	5	3.89	0.807
TL12_B29_My team leader develops a team attitude and spirit among employees	153	1	5	3.66	0.926
TL13_B30_My team leader shows us that he/she expects a lot from us	153	1	5	4.01	0.885
TL14_B31_My team leader insists on only the best performance	153	1	5	4.00	0.889
TL15_B32_My team leader will not settle for second best	153	1	5	3.73	0.987
TL16_B33_My team leader shows respect for my personal feelings	153	1	5	3.73	1.027
TL17_B34_My team leader	153	1	5	3.80	1.009

behaves in a manner thoughtful of my personal needs					
TL18_B35_My team leader challenges me to think about old problems in new ways	153	1	5	3.75	1.023
TL19_B36_My team leader asks questions that prompt me to think	153	1	5	3.82	1.022
TL20_B37_My team leader has stimulated me to rethink the way I do things	153	1	5	3.73	0.988
TL21_B38_My team leader has ideas that have challenged me to re-examine some of my basic assumptions about my work	153	1	5	3.69	0.941
Transformational leadership score	153	1.14	5	3.77	0.699
Valid N (listwise)	153				

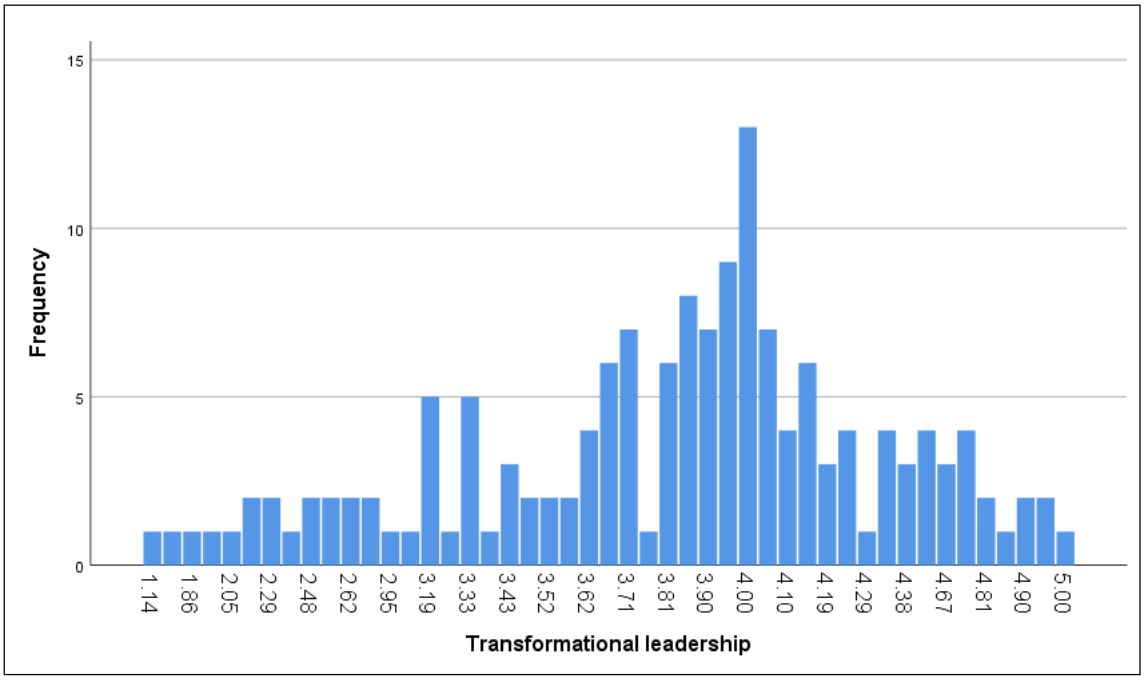

Figure 10: Transformational leadership histogram

5.7 Comparison of mean scores across demographic groups

To determine variability in responses across the various demographic groups the mean scores were compared for each construct across each sub-group.

5.7.1 Gender comparison of mean scores

The sample descriptive statistics between the two groups in table 14 depicts that males on average responded with a 0.6 higher perceived cognitive diversity and slightly lower variability in responses, with a 0.006 lower standard deviation. For the perceived team performance construct, females responded on average higher than males with a 0.13 difference in mean and a lower variability of 0.026 difference in standard deviation. Females also scored higher on average for perceived transformational leadership, with a 0.24 higher mean and lower variability with a 0.129 lower standard deviation.

The Levene's test, depicted in Table 15, is used to assess the equality of variances between two independent groups, i.e. males and females. The test assumes as a null hypothesis that the variances in responses to the three constructs are equal between the two groups. The p-values (sig) compared to the confidence threshold are assumed to be 0.05. For cognitive diversity the significance value is 0.474, the significance value for team performance is 0.958 and the significance value for transformational leadership is 0.151. All three p-values are greater than the significance threshold of 0.05 so the null hypothesis is accepted and the differences in variances between males and females in the sample are assumed the same, with no significant differences between the two groups.

Table 14: Gender group descriptive statistics

Gender		N	Mean	Std. Deviation	Std. Error Mean
Cognitive diversity	Male	87	3.1552	0.60068	0.06440
	Female	66	3.0909	0.60707	0.07472
Team performance	Male	87	3.4460	0.70052	0.07510
	Female	66	3.5711	0.67434	0.08301
Transformational leadership	Male	87	3.6634	0.74359	0.07972
	Female	66	3.9038	0.61506	0.07571

Table 15: Independent samples t-test between gender groups

		Levene's Test for Equality of Variances		t-test for Equality of Means						
									95% Confidence Interval of the Difference	
		F	Sig.	T	df	Sig. (2-tailed)	Mean Diff	Std. Error Diff	Lower	Upper
Cognitive diversity	Equal variances assumed	0.514	0.474	0.652	151	0.515	0.06426	0.09850	-0.13036	0.25888
	Equal variances not assumed			0.651	139.323	0.516	0.06426	0.09865	-0.13077	0.25930
Team performance	Equal variances assumed	0.003	0.958	-1.112	151	0.268	-0.12508	0.11253	-0.34742	0.09725
	Equal variances not assumed			-1.117	142.703	0.266	-0.12508	0.11194	-0.34636	0.09619
Transformational leadership	Equal variances assumed	**2.083***	0.151	-2.130	151	**0.035**	-0.24034	0.11283	-0.46326	-0.01741
	Equal variances not assumed			-2.186	149.831	**0.030**	-0.24034	0.10994	-0.45758	-0.02310

*Level of significance is at 0.05 (two-tailed)

5.7.2 Age-group comparison of mean scores

The one-way ANOVA test was performed to compare the means of the different age group categories. This was performed because there were more than two age group categories in the data. For all three constructs no significant differences were found between the means of the age groups where p-values (sig) <0.05. This is shown in table 16. The results for each of the constructs was the following; cognitive diversity scores F (4,148) = 0.55, p = n.s, team performance F (4,148) = 1.78, p = n.s, and transformational leadership F (4,148) = 0.95, p = n.s. Based on the results, it was suggested that there were no significant differences in the responses between age group categories.

Table 16: One-way Anova results for age groups

ANOVA		Sum of Squares	df	Mean Square	F	Sig.
Cognitive diversity	Between Groups	0.811	4	0.203	0.552	0.698
	Within Groups	54.329	148	0.367		
	Total	55.140	152			
Team performance	Between Groups	3.322	4	0.830	1.780	0.136
	Within Groups	69.026	148	0.466		
	Total	72.347	152			
Transformational leadership	Between Groups	1.860	4	0.465	0.950	0.437
	Within Groups	72.449	148	0.490		
	Total	74.309	152			

5.7.3 Industry comparison of mean scores

The one-way ANOVA test was performed to compare the means of the different industry categories because there are more than two industry categories in the data. Transformational leadership showed significant differences at the p (sig) <0.05 for 11 conditions F (11,141) = 2.22, p = 0.016. This is shown in table 18. The industry with the lowest transformational leadership mean is the manufacturing industry (M = 3.07, SD = 0.98) whilst the industry with the highest mean score was education (M = 4.02,

SD = 0.29). Table 17 shows the means of the constructs across the industry groups. The sample sizes were small for the subgroups.

No significant results were observed between industry groups for the remaining two constructs and were as follows; cognitive diversity scores F (11,141) = 0.71, p = n.s, team performance F (11,141) = 1.52, p = n.s.

Table 17: Descriptive statistics for industry

	Industry	N	Mean	Std. Deviation	Std. Error	95% Confidence Interval for Mean		Minimum	Maximum
						Lower Bound	Upper Bound		
Cognitive diversity	Education	3	3.4167	0.38188	0.22048	2.4680	4.3653	3.00	3.75
	Energy and utilities	2	3.7500	0.70711	0.50000	-2.6031	10.1031	3.25	4.25
	Financial services	25	3.1000	0.48412	0.09682	2.9002	3.2998	2.25	4.00
	Government	3	3.5000	1.00000	0.57735	1.0159	5.9841	2.50	4.50
	Healthcare	5	3.0500	0.32596	0.14577	2.6453	3.4547	2.75	3.50
	Information technology	19	3.2500	0.78174	0.17934	2.8732	3.6268	1.75	5.00
	Manufacturing	5	3.0500	0.89093	0.39843	1.9438	4.1562	1.75	4.00
	Mining	1	3.2500					3.25	3.25
	Professional services	15	3.1500	0.59612	0.15392	2.8199	3.4801	2.25	4.50
	Retail	4	2.7500	0.35355	0.17678	2.1874	3.3126	2.25	3.00
	Telecommunications	27	3.1759	0.54515	0.10491	2.9603	3.3916	2.00	4.00
	Other	44	3.0284	0.61288	0.09240	2.8421	3.2147	2.00	4.75
	Total	153	3.1275	0.60230	0.04869	3.0312	3.2237	1.75	5.00
Team performance	Education	3	3.8067	0.16743	0.09667	3.3907	4.2226	3.71	4.00
	Energy and utilities	2	3.3600	0.70711	0.50000	-2.9931	9.7131	2.86	3.86
	Financial services	25	3.2220	0.79323	0.15865	2.8946	3.5494	1.57	4.57
	Government	3	3.0000	0.37987	0.21932	2.0564	3.9436	2.57	3.29
	Healthcare	5	3.0300	1.07571	0.48107	1.6943	4.3657	1.43	4.43
	Information technology	19	3.4295	0.90732	0.20815	2.9922	3.8668	1.57	5.00
	Manufacturing	5	3.2840	0.83263	0.37237	2.2501	4.3179	2.71	4.71
	Mining	1	3.1400					3.14	3.14
	Professional services	15	3.7900	0.57505	0.14848	3.4715	4.1085	2.29	4.57
	Retail	4	3.1775	0.69481	0.34740	2.0719	4.2831	2.14	3.57
	Telecommunications	27	3.6070	0.58586	0.11275	3.3753	3.8388	2.57	4.71

	Other	44	3.6586	0.51760	0.07803	3.5013	3.8160	2.43	5.00
	Total	153	3.4999	0.68991	0.05578	3.3897	3.6101	1.43	5.00
Transformational leadership	Education	3	**4.2033**	**0.29023**	0.16756	3.4824	4.9243	3.95	4.52
	Energy and utilities	2	3.2150	0.91217	0.64500	-4.9805	11.4105	2.57	3.86
	Financial services	25	3.6892	0.65141	0.13028	3.4203	3.9581	2.10	4.71
	Government	3	3.1100	0.80579	0.46522	1.1083	5.1117	2.43	4.00
	Healthcare	5	3.6560	1.02202	0.45706	2.3870	4.9250	2.00	4.81
	Information technology	19	3.4074	0.95678	0.21950	2.9462	3.8685	1.14	4.95
	Manufacturing	5	**3.0680**	**0.97746**	0.43713	1.8543	4.2817	1.86	4.05
	Mining	1	4.1900					4.19	4.19
	Professional services	15	3.8913	0.77105	0.19908	3.4643	4.3183	2.10	4.95
	Retail	4	3.7500	0.97642	0.48821	2.1963	5.3037	2.29	4.33
	Telecommunications	27	3.8041	0.58392	0.11238	3.5731	4.0351	1.57	4.90
	Other	44	4.0259	0.38313	0.05776	3.9094	4.1424	3.19	5.00
	Total	153	3.7671	0.69919	0.05653	3.6554	3.8788	1.14	5.00

Table 18: One-way Anova results for industry

ANOVA		Sum of Squares	df	Mean Square	F	Sig.
Cognitive diversity	Between Groups	2.894	11	0.263	0.710	0.727
	Within Groups	52.246	141	0.371		
	Total	55.140	152			
Team performance	Between Groups	7.659	11	0.696	1.518	0.131
	Within Groups	64.688	141	0.459		
	Total	72.347	152			
Transformational leadership	Between Groups	10.987	11	0.999	**2.224***	**0.016**
	Within Groups	63.321	141	0.449		
	Total	74.309	152			

*Level of significance is at 0.05 (two-tailed)

5.7.4 Years of service comparison of mean scores

The one-way ANOVA test was used to compare the means of the different years of service categories. This was performed because there were more than two categories of number of service years in the data. For all three constructs no significant differences were found between the means of the years of service groups where p-values (sig) <0.05. This is shown in table 19. The results for each of the constructs was the following; cognitive diversity scores F (3,149) = 0.17, p = n.s, team performance F (3,149) = 1.37, p = n.s, and transformational leadership F (3,149) = 0.66, p = n.s. Based on the results, it was suggested that there were no significant differences in the responses between years of service categories.

Table 19: One-way Anova results for years of service

ANOVA		Sum of Squares	df	Mean Square	F	Sig.
Cognitive diversity	Between Groups	0.192	3	0.064	0.173	0.914
	Within Groups	54.948	149	0.369		
	Total	55.140	152			
Team performance	Between Groups	1.946	3	0.649	1.373	0.253
	Within Groups	70.401	149	0.472		
	Total	72.347	152			
Transformational leadership	Between Groups	0.979	3	0.326	0.663	0.576
	Within Groups	73.330	149	0.492		
	Total	74.309	152			

5.7.5 Job level comparison of mean scores

The one-way ANOVA test was used to compare the means of the different job level categories. This was performed because the number of job level categories in the data is more than two. Team performance showed significant differences at the p (sig) <0.05 for 2 conditions F (2,150) = 4.90, p = 0.009. This is shown in table 21. The job level with the lowest team performance mean is middle management (M = 3.30, SD = 0.62), whilst the job level with the highest mean score was senior management (M = 3.71, SD = 0.69). Table 20 shows the means of the constructs across the job level categories.

No significant results were observed between industry groups for the remaining two constructs and were as follows; cognitive diversity scores F (2,150) = 0.21, p = n.s, transformational leadership F (2,150) = 1.72, p = n.s.

Table 20: Descriptive statistics for job level

	Job level	N	Mean	Std. Deviation	Std. Error	95% Confidence Interval for Mean		Minimum	Maximum
						Lower Bound	Upper Bound		
Cognitive diversity	Professional	51	3.0980	0.58112	0.08137	2.9346	3.2615	2.00	4.75
	Middle manager	56	3.1161	0.66906	0.08941	2.9369	3.2952	1.75	5.00
	Senior manager	46	3.1739	0.54739	0.08071	3.0114	3.3365	1.75	4.25
	Total	153	3.1275	0.60230	0.04869	3.0312	3.2237	1.75	5.00
Team performance	Professional	51	3.5347	0.70645	0.09892	3.3360	3.7334	1.57	5.00
	Middle manager	56	**3.2955**	**0.62349**	0.08332	3.1286	3.4625	1.43	4.43
	Senior manager	46	**3.7102**	**0.69247**	0.10210	3.5046	3.9159	1.57	4.86
	Total	153	3.4999	0.68991	0.05578	3.3897	3.6101	1.43	5.00
Transformational leadership	Professional	51	3.7427	0.77072	0.10792	3.5260	3.9595	1.14	5.00
	Middle manager	56	3.6650	0.71938	0.09613	3.4723	3.8577	1.86	4.71
	Senior manager	46	3.9185	0.56720	0.08363	3.7500	4.0869	2.10	4.90
	Total	153	3.7671	0.69919	0.05653	3.6554	3.8788	1.14	5.00

Table 21: One-way Anova results for job level

ANOVA		Sum of Squares	df	Mean Square	F	Sig.
Cognitive diversity	Between Groups	0.151	2	0.075	0.206	0.814
	Within Groups	54.989	150	0.367		
	Total	55.140	152			
Team performance	Between Groups	4.435	2	2.218	**4.898***	**0.009**
	Within Groups	67.912	150	0.453		
	Total	72.347	152			
Transformational leadership	Between Groups	1.668	2	0.834	1.722	0.182
	Within Groups	72.641	150	0.484		
	Total	74.309	152			

*Level of significance is at 0.05 (two-tailed)

5.7.6 Highest level of education comparison of mean scores

The one-way ANOVA test was used to compare the means of the education level categories because there were more than two categories of education level in the data. For all three constructs no significant differences were found between the means of the education level groups where p-values (sig) <0.05. This is shown in table 22. The results for each of the constructs was the following; cognitive diversity scores F (4,148) = 0.95, p = n.s, team performance F (4,148) = 2.36, p = n.s, and transformational leadership F (4,148) = 2.33, p = n.s. Based on the results, it was suggested that there were no significant differences in the responses.

Table 22: One-way Anova results for highest level of education

ANOVA		Sum of Squares	df	Mean Square	F	Sig.
Cognitive diversity	Between Groups	1.385	4	0.346	0.953	0.435
	Within Groups	53.754	148	0.363		
	Total	55.140	152			
Team performance	Between Groups	4.332	4	1.083	2.357	0.056
	Within Groups	68.015	148	0.460		
	Total	72.347	152			
Transformational leadership	Between Groups	4.395	4	1.099	2.326	0.059
	Within Groups	69.914	148	0.472		
	Total	74.309	152			

5.8 Correlations between cognitive diversity, transformational leadership and team performance

The results of the test showing the correlation coefficients between the constructs cognitive diversity, team performance and transformational leadership are presented in table 23. The relationship between cognitive diversity and transformational leadership is negative whereas the relationship between cognitive diversity and team performance as well as team performance with transformational leadership is positive. There is only one statistically significant relationship (where $p<0.01$) which was between transformational leadership and team performance where $r = 0.688$, $p = 0.000$. This relationship was also considered to be a strong relationship as the r value was higher than 0.5. The relationship between cognitive diversity and team performance was a positive weak relationship as the $r = 0.012$ (less than 0.5) and not statistically significant where p (sig) = 0.886. The relationship between cognitive diversity and transformational leadership is a negative weak relationship where $r = -0.090$ (less than 0.5) and not statistically significant where p (sig) = 0.270. It should also be noted that for linear regression analysis between multiple independent variables with a single dependent variable(discussed below in section 5.9) for the testing of hypothesis two, there should not be multicollinearity between the two

independent variables. It is suggested that the relationship between the independent variables should not be greater than 0.7 which would indicate strong correlation and may suggest that the variables are too similar in prediction models. Here, there is no multicollinearity between cognitive diversity and transformational leadership as the relationship is weak.

Table 23: Correlation between the constructs

		Cognitive diversity	Team performance	Transformational leadership
Cognitive diversity	Pearson Correlation	1	0.012	-0.090
	Sig. (2-tailed)		0.886	0.270
Team performance	Pearson Correlation	0.012	1	.688**
	Sig. (2-tailed)	0.886		0.000
Transformational leadership	Pearson Correlation	-0.090	.688**	1
	Sig. (2-tailed)	0.270	0.000	

n = 153
**. Correlation is significant at the 0.01 level (2-tailed).

5.9 Results for the research hypothesis

Regression analysis was performed to understand the relationships between the constructs and determine the results of the research hypothesis. As stated in Chapter three, for each of the three hypotheses there is a null and an alternate hypothesis. These hypotheses are documented again below and the regression analysis table relating to each is presented. The results of each table are also described in words. The p values for each regression analysis are stated because this is a requirement of the statistical finding to determine the level of significance of the relationship. A significance level of $p < 0.05$ was used to perform each test.

Null hypothesis one ($H_0$1) : No significant positive relationship exists between cognitive diversity and team performance

Alternate hypothesis one ($H_1$1): A significant positive relationship exists between cognitive diversity and team performance

One of the prerequisites for linear regression and prediction is a significant correlation between the constructs. Section 5.3 indicated that there was not a significant correlation between cognitive diversity and team performance and because no relationship exists, no linear relationship exists between the two constructs, regression analysis cannot be performed. The null hypothesis is accepted for hypothesis one. The scatterplot and prediction equation for team performance (TP) is illustrated in figure 11 (where TP = 3.46+0.012 CG) and displays the nonlinear relationship graphically. Since the assumptions were not met for regression analysis and the results show, even though theoretically expected, that cognitive diversity does not predict team performance for the sample.

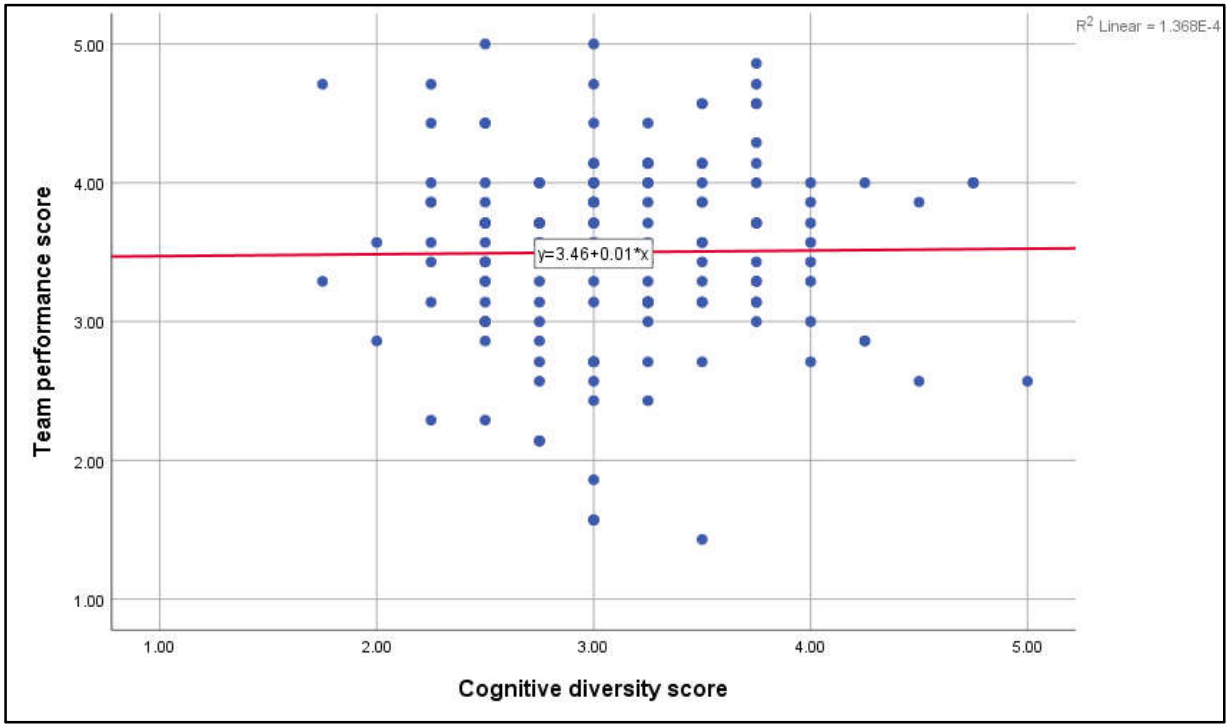

Figure 11: Cognitive diversity score vs team performance score scatterplot

For the second hypothesis, discussed in Chapter two, it was hypothesised that there is a significantly positive relationship between transformational leadership and team performance.

Null hypothesis two ($H_0$2): No significant positive relationship exists between transformational leadership and team performance

Alternate hypothesis two ($H_1$2): A significant positive relationship exists between transformational leadership and team performance

Linear regression analysis was performed to determine whether transformational leadership significantly predicts team performance. The correlation analysis confirmed that there was a significant relationship between the constructs therefore regression could be performed. The regression output is shown in Table 24. The regression equation considered significant was found (F (1,151) = 34.269, p < 0.000 and an R^2 of 0.474). The sample predicted that team performance is equal to 0.942 + 0.679TL. TL is transformational leadership. The correlation coefficient (R) of 0.688 shows that there is strong correlation between transformational leadership and team performance. The adjusted R square in the results shows that 47% of the variability in team performance is explained by transformational leadership. Team performance increases by 0.679 for every unit increase in transformational leadership. The regression equation is significant as the p value is less than 0.05. It can be concluded that the null hypothesis can be rejected in favour of the alternate at the 5% level of significance. Figure 12 shows this linear relationship graphically where TP = 0.942 + 0.679TL.

Table 24: Hypothesis 2 linear regression summary

Model Summary				
Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.688[a]	0.474	0.470	0.50217

a. Predictors: (Constant), Transformational leadership

ANOVA[a]						
Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	34.269	1	34.269	135.891	.000[b]
	Residual	38.079	151	0.252		
	Total	72.347	152			

a. Dependent Variable: Team performance

b. Predictors: (Constant), Transformational leadership

Coefficients[a]						
		Unstandardized Coefficients		Standardized Coefficients		
Model		B	Std. Error	Beta	t	Sig.
1	(Constant)	0.942	0.223		4.220	0.000
	TL	0.679	0.058	0.688	11.657	0.000

a. Dependent Variable: Team performance

Figure 12: Transformational leadership score vs team performance score scatterplot

For the third hypothesis, discussed in Chapter three, it was hypothesised that the significantly positive relationship between cognitive diversity and team performance is moderated by transformational leadership.

Null hypothesis three ($H_0$3): No significantly positive relationship exists between cognitive diversity and team performance moderated by transformational leadership exists

Alternate hypothesis three ($H_1$3): A significant positive relationship exists between cognitive diversity and team performance moderated by transformational leadership

Due to the fact that the null hypothesis for hypothesis 1 was accepted, which shows that no significant linear relationship exists between cognitive diversity and team performance, the null hypothesis for hypothesis 3 is also accepted. One of the

prerequisites for moderation of a relationship is that a significant relationship between the underlying dependent and independent variable exists.

5.10 Conclusion

The principle findings of the chapter and results of the research conducted is as follows:

- There appears to be no significant relationship between cognitive diversity and team performance
- There appears to be a significant positive relationship between transformational leadership and team performance.
- There appears to be no significant relationship between cognitive diversity and team performance moderated by transformational leadership.

Chapter six will analyse these results further relative to the literature which was reviewed in chapter two.

6. DISCUSSION OF RESEARCH RESULTS

6.1 Introduction

The purpose of this chapter is to discuss the research findings from Chapter five together with the literature reviewed in Chapter two. This enables the researcher to gain a deeper understanding, provide insights and add to the existing body of knowledge for each of the constructs chosen for this study. The arguments presented in this chapter will show agreement with or contradiction to the literature as well as new findings that can be added to the existing literature. Inferences made in this chapter are determined from the sample data collected.

The first discussion is on the demographic data collected for each of the constructs. This is to unpack the composition of the sample and whether sampling bias is present as well as to understand the profiles of the data to support some of the arguments in the subsequent sections where the statistical test results is discussed. The descriptive statistics for each of the three constructs identified in Chapter two; cognitive diversity, team performance and transformational leadership are then analysed and discussed in comparison the to literature. Finally, the research hypotheses developed in Chapter three are presented and discussed in terms of the statistical tests results from Chapter five and the body of literature supporting the hypothesis formulation from Chapter two.

6.2 Sample demographics

During the data collection period, 158 completed responses were received. 5 respondents did not meet the population criteria for the study as they were not within the professional, middle manager or senior manager job category demographic. As such the final sample size was a total of 153 participants. The target population for this study were professionals, middle and senior managers working for corporates in South Africa. The job level composition within the sample was made up of 33% professionals, 37% middle managers and 30% senior managers (refer to section 5.3). This is a reasonably even representation of job level within the sample. The researcher also analysed the comparison of mean scores across job level in section 5.7.5 where significant differences were observed for the team performance construct for both the middle manager and senior manager categories. The senior manager category

showed the highest mean score for team performance and middle managers showed the lowest mean score. As discussed in chapter two, section 2.5, leadership characteristics focussed on whether the relationship between the leader and team member can motivate the follower towards certain performance outcomes, help them see the greater good of the task and strengthen the outcome (Amanchukwu et al., 2015). It is therefore expected that the senior manager category should show the highest mean score for team performance as they would be more inclined to possess greater leadership qualities and be required to have to demonstrate these in terms of a performance outcome measurement perspective within their organisations . These findings, showing greater performance outcomes within the senior manager category, also suggest for future research that narrowing of the population of this study to senior managers only could potentially increase the contribution of the results.

The respondents worked in various industries. The highest number of respondents were in the “other” category (44 observations or29%), out of the 153 sampled. Of these 44 observations (36 or24%) were from the media or entertainment broadcasting which is the industry the researcher works in. The second highest group of respondents were from the telecommunications industry with 27 (18%) followed by the financial services industry with 25 (16%). This is not an unusual composition of industries within the sample as the telecommunication and financial services industries employ large numbers of professionals, and management individuals representing the target population under study.

Significant differences between the industry category means were found within the transformational leadership construct. The education category mean score was the highest whereas the construction industry showed the lowest mean within the transformational leadership construct. Transformational leadership as a construct comprised of the six dimensions was observed, developed and documented through years of academic research (Zhang et al., 2011) It is therefore expected to be a widely known and understood construct in the education industry, particularly in the higher education segment in the field of leadership and management. This deeper level of understanding is expected to yield greater results on the perceived presence of the transformational leadership characteristic of the team leader.

The gender representation in the sample was 57% male and 43% female. This slightly higher proportion of males in the sample is not indicative of an imbalanced gender representation. The population of this study are professionals and management level individuals in companies in South Africa, therefore a larger proportion of male to female is expected in the sample. Levene's test to assess equality of variances between two groups showed no significant differences between male and female responses for all three constructs. The literature reviewed in chapter two also does not indicate any researched or expected differences between gender groups for cognitive diversity, team performance and transformational leadership.

The age composition of the sample showed 14% of respondents falling between the ages of 21-19, 57% between the ages of 30-39, 23% between the ages of 40-49, 5% between 50-59 and less than 1% over 60. It is not surprising that most of the respondents were between 30-39 because by this age it is expected that individuals have completed a tertiary and/or professional qualification and they would have worked for a reasonable period before being promoted into a middle or senior manager position at the company. It would also be expected that the lowest age demographic would be above the age of 50 years old as these individuals, having worked many years, would be in top leadership positions in companies or retired. The mean scores across the age categories were compared and there were no significant differences in the responses between age group categories. Literature reviewed in chapter two also did not indicate any researched or expected differences age groups for the cognitive diversity, team performance and transformational leadership constructs.

The highest level of education composition of the sample showed 69% of the respondents hold a post graduate degree, 12% hold a degree, 8% hold a certificate/diploma, 3% hold a matric and 8% responded as "other". In the "other" category most respondents entered other professional qualifications such as "chartered accountant". It is expected that a clear majority of the sample would hold a post graduate degree as the target population for the study are professionals, as well as middle and senior managers. The minimum requirements for these occupations in

South Africa typically require some form of post graduate degree. The mean scores across the education level categories were compared and there were no significant differences in the responses between the categories.

The years of service composition of the sample was analysed and showed that the largest proportion of respondents, 45%, have worked for their current employer for between 1 and 5 years, this is followed by the 5 to 10 year category where 30% of the responses were observed. The two lowest years of service categories were the less than 1 year of service, which contained 13% of the responses and more than 10 years of service which contained 12% of the responses. This sample composition for years of service supports the observations for age category and education categories above. It is expected that professional, middle and senior managers would finish a post graduate degree or professional qualification and work for a few years before moving higher within the organisation in a middle or senior manager role. The mean scores across the years of service categories were compared and there were no significant differences in the responses between the categories.

The number of valid responses making up the sample of 153 was concluded to be adequate by the researcher for this study. There are also no apparent sampling biases which would be of concern. The research findings for the sample are analysed in relation to the arguments from the literature in chapter two for each of the three constructs and will be discussed in the following sections.

6.3 Team performance

The average score for the team performance construct showed that the sample agreed that their team is performing under the current leadership. This is also supported by the two modal values confirming agreement with the perceived presence of the construct. The frequency table data showed that for 5 of the 7 items in the scale measuring the construct, most responses agreed with the statement. The standard deviation is also not too dispersed. This result is aligned with the researcher's expectations when considering the industry composition of the sample. The three major industries represented in the sample are broadcast media, telecommunications

and financial services. In the South African context, the three industries are dominated by a few large players in the market. One would therefore consider them to be hypercompetitive. In this respect Hoisl, Gruber and Conti (2017) performed a study on the effects of diversity of research and development teams on its performance outcomes in a hypercompetitive environment. Diversity in teams was considered to encourage greater knowledge, expertise, opinions, network relationships and evaluation of solutions, allowing the team to develop different insights and identify those solutions that ensure higher performance. Diverse teams are less susceptible to group-think and will not accept unsuccessful solutions, ensuring higher performance outcomes. The results of the study showed that task-related experience diversity in R&D teams increases the team's performance but only up to a point. Based on the sample results of this study on cognitive diversity, the sample data showed there is a moderate level of perceived cognitive diversity within the respondent's teams and, coupled with the finding that the industries most represented are all hyper competitive industries, it was expected that the results would show agreement with the statements that their teams are performing.

Solakoglu and Demir (2016) studied demographic diversity - specifically gender diversity - and performance. It is argued that a demographically diverse group of leaders will have a wider perspective of the business context in which the organisation operates, which in turn will lead to improved performance as better decisions will be made through assessment of more strategic alternatives. It may also lead to better corporate image as well as selection of talent from a wider pool and thus better performance. Based on the demographic results of the sample in this study, specifically on gender diversity, there is a relatively balanced split between male and female professionals and managers. The sample data therefore supports the findings about gender diversity and team performance, as there is both presence of gender balance in the sample and perceived presence of team performance.

The sample demographic section above also looked at the comparison of mean scores for each category within a demographic criterion, which was analysed per construct. For team performance significant differences were observed, where $p<0.05$, for certain job level categories within the organisation. This was for both the middle manager and

senior manager categories. The senior manager category showed the highest mean score for team performance and middle managers showed the lowest mean score. The finding was expected, given the argument by Amanchukwu et al. (2015), in which the leader and team member can motivate the follower towards certain performance outcomes and help them see the greater good of the task and can strengthen the outcome. Senior managers are expected to possess more leadership qualities to meet or exceed performance outcomes when compared to the other job level categories and therefore the higher senior manager mean scores are reasonable.

6.4 Cognitive diversity

A review of the descriptive statistics for cognitive diversity revealed overall that the sample perceived a moderate level of cognitive diversity within their team and the standard deviation showed that the responses are not too dispersed. The Cronbach Alpha for this construct, discussed in section 5.5.1, was only 0.622 which indicates a moderate level of internal consistency for the sample. The analysis for this construct is therefore exploratory in nature. When comparing this result to the literature in chapter two and considering the population of this study, the results are aligned with the researcher's expectation. Mitchell et al. (2017) studied cognitive diversity of professionals in multidisciplinary teams and found that these individuals want to defend and justify their profession and are motivated by these feelings. Their behaviour within the team will be aimed at increasing the breadth of information available to make better, more informed decisions. They also are motivated by articulating and demonstrating their professions unique priorities and expertise. These individuals understand that having a cognitive diverse team will result in decisions which will include diverse opinions. The sample data showed that the professionals, middle and senior managers perceived a moderate level of cognitive diversity within their teams which accords with the research by Mitchell et al. (2017), although it's unclear whether their teams are multidisciplinary as this was out of the scope of the study.

The researcher also compared the moderate level of perceived cognitive diversity results from the sample to the major industries represented in the demographic data -

broadcast media, telecommunications and financial services. Interestingly, these industries have been widely known in recent years to be highly susceptible to digital and technological disruption. Chen et al. (2019) noted that diverse teams with differences in knowledge, backgrounds and access to different sources of information can encourage creativity and innovation to solve emerging business problems and are thus becoming a necessity in today's organisations. The Wang et al. (2016) study of the positive relationship between cognitive diversity and team creativity is notable here; creativity was described as the building of unique and valuable ideas regarding the organisation's products, services, processes, and procedures by the team working as a collective unit. One would expect that industries most susceptible to disruption by technology would build more cognitively diverse teams to stimulate creativity and innovation to solve emerging problems within the organisation's industry. This argument is also supported by Kim et al. (2012) where it was noted that cognitive diversity encourages team creativity through more creative processes, by providing the team members with a greater scope of ideas, opinions, knowledge and values. It was not surprising to the researcher that a moderate level of cognitive diversity was present in the data. The companies in the major industries represented in the data are required to come up with creative and innovative ideas or risk their relevance and market share through disruption.

6.5 Transformational leadership

Analysis of the descriptive statistics for transformational leadership showed overall that the sample agreed that their leader displayed transformational leadership characteristics and the standard deviation showed that the responses are not too dispersed. Reviewing these results in relation to the literature discussed in chapter two, together with the scores for team performance in the sample, the results are in line with the researcher's expectations. As discussed above in section 6.3, the sample agreed that their team is performing under the current leadership. Nguyen et al. (2017) argue that the transformational leader motivates his/her followers to focus on achieving goals, rather than the rewards associated with the outcome. The followers instinctively will act in line with achieving the long-term vision of the leader and are inspired to go above and beyond what would normally be expected of them, thus

ensuring that the team and fellow members perform. This is achieved through the transformational leader's ability to influence the follower's motivation to increase efforts when applying themselves to tasks. Boies et al. (2015) make a similar argument in terms of the leadership qualities of a transformational leader - intellectual stimulation and inspirational motivation - resulting in the team achieving greater creativity and task performance outcomes. The sample results show that the respondents believe their leader is transformational and that their teams are performing under the current leadership.

The Chin et al. (2019) study of transformational leadership and employee engagement is also relevant when analysing the results of this study. The findings of the research which showed a positive relationship between the two constructs. This was due to the leader's emphasis on the follower's workplace responsibility to take on more challenges; the follower therefore feels like their work is more meaningful, resulting in greater creativity and role performance. As such high levels of transformational leadership are expected to create high levels of team performance. The results of this study showed that overall the respondents agreed that their leader showed transformational leadership characteristics and that their teams were performing.

The transformational leadership results are also aligned with the literature when analysed in conjunction with the cognitive diversity results and team performance results in the sample. Section 6.4 discussed that the sample overall perceived a moderate level of cognitive diversity in their teams and section 6.3 showed the sample agreed overall that their teams are performing. Wang et al. (2016) argued that in the current rapidly changing business environment, teams are required to come up with new and innovative ideas to solve complex problems and the leader is required to create and motivate a cognitively diverse team to collaborate and solve for the business problems as well as motivate the team towards performance in achieving the team's objectives. It was therefore expected in the results that when there is a presence of performing teams in the current business context of industry disruption and competition, there would be an expectation of both cognitive diversity within the teams and transformational leadership qualities of the leaders of those teams. As mentioned in section 6.2 above under demographics, the industries represented in the

sample are facing the challenges described. The sample results showed moderate levels of cognitive diversity, agreement that their leaders display transformational leadership qualities and that their teams are performing - a result expected by the researcher, given the literature analysis.

An argument by Kim et al. (2012) should also be considered when analysing the results in this study. Their research showed that the relationship between cognitive diversity and team creativity was only positive when transformational leadership was high. It was argued that the reason for this is that the leadership qualities of the transformational leader can minimise negative influences (e.g. the social categorisation processes) and maximise the positive influences of team diversity on team creativity. It is therefore required by leaders who have cognitively diverse teams to demonstrate transformational leadership qualities to get the members work together and achieve greater outcomes. Choi et al. (2016) also make a similar argument; their research argues that the characteristics of transformational leadership which motivate employees to work towards the long-term vision also stimulates cross-functional knowledge sharing and learning across the organisation. This then results in the generation of innovative ideas. The argument by Choi et al. (2016) supports the argument of this study (that transformational leadership inherently encourages cognitive diversity and performance outcomes in the organisation). The results of this study showed that the sample agreed that their teams were moderately cognitively diverse, their leaders displayed transformational leadership qualities and that their teams are performing.

6.6 Discussion of research hypotheses results

6.6.1 The relationship between cognitive diversity and team performance

The purpose of this study was to determine whether a relationship exists between cognitive diversity, transformational leadership and team performance. Furthermore, it aimed to understand whether the relationship between cognitive diversity and team performance was moderated by transformational leadership. This section discusses the results of the sample data with the aim of answering hypothesis one.

Null hypothesis one ($H_0$1) : No significant positive relationship exists between cognitive diversity and team performance

Alternate hypothesis one ($H_1$1): A significant positive relationship exists between cognitive diversity and team performance

The results in section 5.8, which describes the correlations between cognitive diversity and team performance constructs, showed that there is a weak positive relationship that is not significant. Section 5.9 results for the research hypothesis concluded that the null hypothesis was accepted for hypothesis one. This result is contrary to the hypothesised model (Figure 1) by Guillaume et al. (2017), which provided the foundation in the literature used to formulate hypothesis one. The model proposed that that the outcomes of having a diverse climate in the organisation are performance, social integration and well-being. The study and hypothesised model by Guillaume et al. (2017) defined diversity as a broad construct which was formulated from secondary research on all types of organisational, work group and workplace diversity whilst this study narrowed diversity to a specific type of diversity, namely cognitive diversity. This is considered the most likely reason behind the results. The researcher set out to understand whether a deeper level diversity that transcends the more commonly studied surface level demographic diversity would support greater performance outcomes in teams and organisations, however this could not be shown in the study. This study could be performed with broader and various other types of diversity to determine whether they support performance outcomes. This would overcome the limitation of this study. Another limitation of the study (in section 4.5.1), which could have impacted the results, is that the perceptions of management individuals about their teams were studied whereas teams within organisations could have been studied. This is further discussed in Chapter seven under limitations of the study and possible future research.

6.6.2 The relationship between transformational leadership and team performance

As mentioned in chapter three, should a moderating variable be incorporated into a study a relationship between the moderating variable and outcome variable is a pre-requisite and, as such, a positive relationship between transformational leadership and team performance would need to be shown. This study was undertaken to understand whether a relationship exists between cognitive diversity and team performance, as well as to understand whether a moderating factor (transformational leadership) strengthens this relationship. This was the rationale behind the formulation of hypothesis two which is the pre-requisite hypothesis.

Null hypothesis two ($H_0$2): No significant positive relationship exists between transformational leadership and team performance

Alternate hypothesis two ($H_1$2): A significant positive relationship exists between transformational leadership and team performance

The results in section 5.9 results concluded that the alternate hypothesis was accepted for hypothesis two. This aligns with the researcher's expectations when considering the results of the literature review in chapter two. Zhang et al. (2011) performed a study of teams to determine whether transformational leadership promotes team co-ordination as a mediating variable that ultimately resulted in the team performance outcome. This hypothesis was proven as part of a study of teams in large Chinese parastatal organisations. It was expected that a similar result would be found in the South African context and is corroborated by the results of this study which showed a significant positive relationship between transformational leadership and team performance.

The theoretical argument supporting this finding is that transformational leaders inspire their followers to work towards the team's collective goals and not only self-fulfilling goals - which enhances the follower's commitment to the work, level of effort and performance (Zhang et al., 2011). The results of this study however showed that the mediating variable of team co-ordination was not required for transformational leadership to relate positively to and predict the team performance outcome, thereby

adding to the existing research by Zhang et al. (2011). This results of the study are however supported by the literature from Nguyen et al. (2017), the argument is that the transformational leader motivates his/her followers to achieve the goals of the team through appealing to their ideals and morals and the followers are inspired to go above and beyond what would normally be expected of them, thereby improving performance. Boies et al. (2015) make a similar argument and note that the intellectual stimulation and inspirational motivation qualities of a transformational leader supports the team in achieving greater creativity and task performance outcomes.

6.6.3 The relationship between cognitive diversity and team performance moderated by transformational leadership

As mentioned in the previous two subsections, the purpose of this study was to determine whether a relationship exists between cognitive diversity, transformational leadership and team performance. In addition, a further hypothesis (hypothesis three) emerged from the literature review which aimed at determining whether the relationship developed under hypothesis one was moderated by transformational leadership.

Null hypothesis three ($H_0$3): No significantly positive relationship exists between cognitive diversity and team performance moderated by transformational leadership exists

Alternate hypothesis three ($H_1$3): A significant positive relationship exists between cognitive diversity and team performance moderated by transformational leadership

As mentioned in section 6.6.1 no significant relationship exists between cognitive diversity and team performance. For moderation to be shown in a study, a significant relationship is required to exist between the dependent and independent variables. As such the null hypothesis for hypothesis three was also accepted. The discussion on the results for hypothesis one also applies in this instance. The literary basis behind the formulation of hypothesis one and hypothesis three was the research and hypothesised model (Figure 1) by Guillaume et al. (2017). The model proposed that

that the outcomes of having a diverse climate in the organisation are performance, social integration and well-being and that there are six moderating variables that enable a diverse climate in the organisation. One of the six variables was leadership, where transformational leadership was found to be studied the most in terms of team diversity in the research. The same argument mentioned under section 6.6.1 applies, the wider definition of diversity and the impact of the remaining moderating variables on the hypothesised relationship was not part of this study.

This study was narrowed and scoped to research cognitive diversity as a construct and one moderating factor namely transformational leadership. Cognitive diversity and the moderator could not be shown to predict team performance in the sample. As mentioned previously (in section 4.5.1), a limitation of the study which could have impacted the results, is that the perceptions of management individuals about their teams were studied whereas teams within organisations should have been studied. This is further discussed in Chapter seven under limitations of the study and possible future research.

6.7 Summary of research findings

The summarised findings are illustrated in Figure 13 below. It shows the relationships identified in the data collected. The figure also indicates the core literature which the findings support. The research objective was not met for this study because no relationship was found between cognitive diversity and team performance, however further knowledge has been added to an existing study by Zhang et al. (2011). It was found that team co-ordination as a mediating factor was not required for the transformational leadership relationship with team performance. This was proven in this study. This study also provided a South African perspective to the study by Zhang et al. (2011).

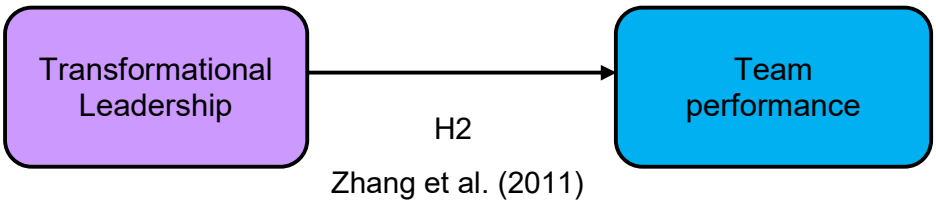

Figure 13: Summarised research findings and supporting literature

7 CONCLUSION

7.1 Review of the study objectives

Reflecting on the research problem and objectives of the study in section 1.3, it was unknown to academics and business leaders whether teams comprising of individuals with difference cognitions would generate greater performance outcomes in organisations. The objective of the research was therefore to provide useful insights to business leaders and managers who build teams on whether they should build cognitively diverse teams and change their recruitment processes to include selection practises that would test for differences in cognition. Derous, Buijsrogge, Roulin and Duyck (2016) mention that the job interview is often the primary if not only method for candidate selection in organisations and this is prone to subjectivity, selection bias and ultimately discrimination. This motivated the need for a study on diversity, more specifically a type of diversity that is beyond surface level diversity.

The researcher's initial thoughts based on the literature reviewed in chapter two and hypothesis formulation in chapter three was that there appeared to be a positive relationship between cognitive diversity and team performance. This was determined from the research by Wang et al. (2016) and Chen et al. (2019), where cognitive diversity was proven to show positive relationships to team innovation and creativity however never tested further to performance related outcomes. The hypothesised model (figure 1) by Guillaume et al. (2017), suggested this further outcome when a diverse climate exists in the organisation. It was expected that a positive relationship between transformational leadership and team performance would be found based on the study by Zhang et al. (2011). The relationship between cognitive diversity and team performance was thought to be moderated by transformational leadership because of the qualities of the leader to enhance the positive impacts and reduce the negative impacts of team diversity and leadership characteristics that motivates and intellectually stimulates the follower team members towards achieving the vision of the leader (Chen et al., 2019; Kim et al. 2012; Choi et al., 2016). The moderation was also supported by the hypothesised model by the hypothesised model (figure 1) by Guillaume et al. (2017), who notes leadership as one of six moderators of a diverse climate in organisations resulting in organisational and team outcomes.

The hypotheses are reflected upon again:-

Hypothesis 1: There is a positive relationship between perceived team cognitive diversity and team performance

- Null hypothesis one ($H_0$1)
  No significant positive relationship exists between cognitive diversity and team performance
- Alternate hypothesis one ($H_1$1)
  A significant positive relationship exists between cognitive diversity and team performance

Hypothesis 2: There is a positive relationship between transformational leadership and team performance

- Null hypothesis two ($H_0$2)
  No significant positive relationship exists between transformational leadership and team performance
- Alternate hypothesis two ($H_1$2)
  A significant positive relationship exists between transformational leadership and team performance

Hypothesis 3: The positive relationship between cognitive diversity and team performance is moderated by transformational leadership

- Null hypothesis three ($H_0$3)
  No significantly positive relationship exists between cognitive diversity and team performance moderated by transformational leadership exists
- Alternate hypothesis three ($H_1$3)
  A significant positive relationship exists between cognitive diversity and team performance moderated by transformational leadership

The results and analysis of the sample data collected for this study is summarised below; these findings may be of interest and have potential uses for organisations,

academics and business schools which are then discussed. Lastly, the limitations of this study and recommendations of future research are highlighted.

7.2 Summary of results per hypothesis

Although the results of the study did not confirm all three of the researcher's hypotheses, one hypothesis was confirmed and does provide interesting insights and adds to existing literature on the topic. The hypothesised model (Figure 1) by Guillaume et al. (2017) was used as a basis for formulation of hypotheses one and three, it assisted the researcher in understanding the interrelatedness between the three constructs of the study. The model proposed that one of the three the outcomes of a diverse climate in the organisation is performance and there are six moderators of a diverse climate; leadership being one of them. Hypotheses one did not show a significant positive relationship between cognitive diversity and team performance as such, the result for hypothesis three which aimed at understanding whether transformational leadership moderated the relationship could not be shown.

The test result for hypothesis two did show a significant positive relationship between transformational leadership and team performance. This confirmed a Chinese study by Zhang et al. (2011) of teams within a large parastatal. However, the Zhang et al. (2011) study showed that the relationship between transformational leadership and team performance was mediated by team co-ordination. The results of this study where no mediating factor was included showed a significant positive relationship between the two constructs. This finding was supported by literature from Nguyen et al. (2017) and Boies et al. (2015), where the followers are intellectually and inspirationally motivated by the transformational leader resulting in improved creativity and performance outcomes. The leader appeals to the values and morals of the follower and motivates them to go above and beyond what they would normally do, resulting in greater performance.

7.3 Contributions of the study

The study did not meet all the objectives that it initially set out to achieve, however there are useful insights that can be considered for organisations, academics and

business schools. The most important finding of the study based on the data collected showed that there is a significant positive relationship between transformational leadership and team performance outcomes. Organisations wishing to improve their performance, should consider implementing practices on identifying, recruiting and developing individuals that display transformational leadership characteristics for leadership roles within their structures. The performance outcome construct tested in this study included aspects of financial, commercial, reputational and relational (relationships with stakeholders and employees) performance. All of which are important and relevant for organisations operating in the current competitive and rapidly changing business environment. For leaders of organisations wishing to improve their own transformational leadership qualities and HR professionals wishing to develop these qualities internally in organisations Curtis and Cerni (2015) suggests that they should work on improving the leaders imaginative and creative characteristics through guided reflection leadership coaching. Coaching is done through supporting the leader to increase their awareness of how they think. The argument for this type of technique is that creativity and imagination should assist the leader in developing different ways in which to inspire followers to go above and beyond their own self interest and motivate them towards the team and organisation's collective vision.

For academics, the findings of this study add to the existing research on the topics covered. The Chinese study by Zhang et al. (2011) where a positive relationship between transformational leadership and team performance mediated by team co-ordination was shown, has been confirmed in a South African context. However, in this study it was shown that no mediating factor was necessary for the relationship to exist. The existing research and literature on cognitive diversity has shown that are relationships to creativity and innovation outcomes (Wang et al., 2016; Kim et al., 2012) however this study aimed to show that the outcomes could be further reaching towards meeting team and organisational performance objectives. The results of this study did not show the relationship.

This research is also useful for business schools; their aim is to transform students into business leaders so they may lead and manage within organisations with suitable skills (Nonet, Kassel, & Meijs, 2016). The findings can be incorporated into executive

leadership short programmes and qualifications such as the MBA. Incorporating aspects of transformational leadership theory and practice into the learning material along with its positive benefits in outcomes for their organisations will increase the awareness of students to work on their transformational leadership soft skills.

7.4 Limitations of the study and possible future research

Reflecting on the methodology chapter of this study (chapter four), the purposive non-probability sampling method was called out as a limitation. The sample selection was not random because obtaining a complete listing of managers and professionals working in corporates in South Africa was not possible. Furthermore, the researcher was not able to access all individuals who met the population criteria due to geographic limitation, the researcher collected data from participants in the Gauteng area. To obtain greater sample size for the study, the researcher also included snowball sampling method where individuals were asked to forward the survey link to participants who met the population criteria, it is uncertain whether this broadened the data collection to outside the Gauteng area. The recommendation for future research, although difficult, would be to perform random statistical sampling of this same study which could result in different outcomes specifically for hypotheses one and three which not proven in this study and could substantiate the result for hypothesis two.

Another limitation also linked to the nature and methodology choice of the study. This study was a quantitative study that used an online questionnaire built from published research of the scales measuring the three constructs of the study. This was followed to ensure the researcher could answer the research questions appropriately. The disadvantage of using the questionnaire is that it is not in enough detail to offer explanatory relationships between the constructs. The demographic questions and perceptions of the 32 items measuring perceptions of cognitive diversity, transformational leadership and the performance of the team were in total answered within a 10-minute time frame by each participant. Follow on questions to gain a deeper understanding of the nature of interrelatedness could not be asked. A recommendation for future research would be that this study be conducted as a

qualitative study where teams are interviewed on their perceptions of the three constructs along with additional questions to understand the factors that influence their perceptions.

A limitation was identified based on the Cronbach Alpha test result measuring internal consistency of the items measuring cognitive diversity. The result showed that there was only a moderate level of internal consistency for the sample and therefore the analysis for this construct in this study was therefore only exploratory in nature. Further to this, the test for validity of the sample data using exploratory factor analysis showed that only one factor, for the four items measuring cognitive diversity, had loaded as expected. The transformational leadership and team performance items had loaded across multiple factors because the transformational leadership scale measures six different dimensions within it. The results did not align the to the researcher's expectations, this is likely due to the sample size.

The objective of the study is called out as a limitation. The study objective was aimed at gaining deeper knowledge and understanding of the perceived level of cognitive diversity of teams, the teams' performance and the transformational leadership characteristics of the leader of teams within South African organisations. This suggested a need to study teams and not individuals, however the study was conducted in a manner that surveyed managers about their perceptions on the items measuring each construct in relation to their team. This approach was chosen to allow for data collection on teams to be conducted in a shorter timeframe as time was a constraint on this study. The suggestion for future research would be that all individuals within a sample of teams be surveyed, and the average scores of the responses for the team be studied in the same manner conducted in this study.

A limitation identified during the analysis of results (chapter six) related to the scoping and narrowing of the wide definition of diversity to study cognitive diversity. The hypothesised model (Figure 1) by Guillaume et al. (2017) showed the relatedness between diversity (as a broad construct) and team performance with leadership (as one of six moderators) moderating the relationship. This informed the formulation of

hypothesis one and three. A limitation of the study was that a narrow and specific type of diversity (cognitive diversity) was studied because there are numerous types and definitions of diversity in the field of business research. The second limitation of the study was that all six moderators of the hypothesised model could not be studied due to time constraints. 'Leadership' narrowed and scoped to the 'transformational leadership' construct was studied as potential moderator since it is the most common type of leadership associated with diversity research. A recommendation for future research would be to re-perform this study however using broader and different definitions of diversity to determine whether positive relationships to performance outcomes exist. Similarly, the six proposed moderators could be included in the recommended studies of re-performance to determine whether they influence the relationship.

7.5 Concluding comments

The topic of cognitive diversity was chosen for this study as it was a subject which interested the researcher. Surface level diversity, the most common being demographic diversity is often debated and discussed both in business and academia with mixed views, however the researcher set out to understand whether there was deeper more specific type of diversity that could be studied in relation to specific performance outcomes that could add to the literature. This objective was not achieved however, this study did add to the body of knowledge on transformational leadership and its characteristics that support the achievement of greater performance outcomes.

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APPENDICES

Appendix A: Questionnaire

Preamble

Dear Respondent

I am conducting research on the relationship between cognitive diversity in teams and its relationship to team performance. This research is a requirement for completing my MBA at the Gordon Institute of Business Science (GIBS). Cognitive diversity is defined as “perceived differences in thinking styles, knowledge, skills, values, and beliefs amongst team members”. Transformational leadership as a moderating factor is also a component of the study. The research aims to provide insights to organisations on whether they should build more cognitively diverse teams to achieve more favourable performance outcomes and what leadership characteristics should be groomed to enhance the outcomes.

The questionnaire should not take more than 10 minutes of your time to complete. Participation in the research is voluntary, as such you may withdraw at any time without penalty. Data collected will be kept confidential. Information collected from respondents is anonymous and cannot be used to identify a participant. Completion of the survey indicates that you voluntarily agree to participate in this study. Should you have any questions please contact myself or my research supervisor.

Our details are as follows:

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Supervisor: Dr Charlene Lew

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Section A

Please indicate the applicable option relating to you:

1. Please select your gender

   Male

   Female

2. Please select your age category

   21-29

   30-39

   40-49

   50-59

   60 and over

3. Please select the industry you work in

   Agriculture

   Manufacturing

   Financial services

   Telecommunications

   Mining

   Retail

   Information technology

   Healthcare

   Transportation

   Energy and utilities

   Government

   Education

   Professional services

   Other_ specify

4. Please indicate the number of years of service completed at the company you work for

   Less than 1 year

   Between 1 to 5 years

   Between 5 and 10

years

More than 10 years

5. Please indicate your job level in the organisation you work for

   Professional

   Middle manager

   Senior manager

   Other

6. Please indicate your highest level of education completed

   Matric

   Certificate/Diploma

   Degree

   Post graduate degree

   Other

Section B

1. This section identifies how cognitively diverse the team is and is measured on a 5-point Likert scale.

   Scale

   1 To a very small extent

   2 To a small extent

   3 To a moderate extent

   4 To a large extent

   5 To a very large extent

   To what extent do the members of your work group/team differ on the following characteristics:

7. To what extent do the members of your team differ on **way of thinking** 1___2___3___4___5

8. To what extent do the members of your team differ on **composition of knowledge and skills** 1___2___3___4___5
9. To what extent do the members of your team differ on **views on the world** 1___2___3___4___5
10. To what extent do the members of your team differ on **beliefs on what is considered right or wrong** 1___2___3___4___5

Source: Van der Vegt and Janssen (2003, p. 737)

2. This set of questions identifies the level of performance of the team the respondent works in and is measured in terms of a 5-point Likert scale

Scale

1	Strongly disagree
2	Disagree
3	Neither agree nor disagree
4	Agree
5	Strongly agree

Please answer the following questions based on the extent to which you agree or disagree with the following statements about your team's performance during the period your current leadership has been in place.

11. Under the team's leadership the unit has rapid revenue growth 1____2____3____4____5____
12. Under the team's leadership the unit has rapid profit growth /cost savings growth* (if unit is a cost centre) 1____2____3____4____5____
13. Under the team's leadership the 1____2____3____4____5____

unit is slow in expanding major business

14. Under the team's leadership the unit builds good relationships with stakeholders* 1____2____3____4____5____
15. Under the team's leadership the unit enjoys good reputation in the local region 1____2____3____4____5____
16. Under the team's leadership the unit has high employee satisfaction 1____2____3____4____5____
17. Under the team's leadership the unit has high employee morale 1____2____3____4____5____

Source: Zhang, Cao and Tjosvold (2011, p.1608)

* These have been adapted slightly to apply to survey respondents from a non-parastatal organisation but have not changed the overall meaning of the item in the scale

3. This set of questions identifies whether the leader of the team or unit is a transformational leader and is measured on a 5-point Likert scale

Scale

1 Strongly disagree
2 Disagree
3 Neither agree nor disagree
4 Agree
5 Strongly agree

Please answer the following questions based on the extent to which you agree or disagree that your leader exhibits the following characteristics;

18. My team leader has a clear 1___2___3___4___5___

understanding of where we are going.

19. My team leader paints an interesting picture of the future for our group. 1___2___3___4___5___
20. My team leader is always seeking new opportunities for the organization 1___2___3___4___5___
21. My team leader inspires others with his/her plans for the future 1___2___3___4___5___
22. My team leader is able to get others committed to his/her dream 1___2___3___4___5___
23. My team leader leads by ‘doing’, rather than simply by ‘telling’ 1___2___3___4___5___
24. My team leader provides a good model for me to follow. 1___2___3___4___5___
25. My team leader leads by example 1___2___3___4___5___
26. My team leader fosters collaboration among work groups 1___2___3___4___5___
27. My team leader encourages employees to be ‘team players’ 1___2___3___4___5___
28. My team leader gets the group to work together for the same goal 1___2___3___4___5___
29. My team leader develops a team attitude and spirit among employees 1___2___3___4___5___
30. My team leader shows us that he/she expects a lot from us 1___2___3___4___5___
31. My team leader insists on only the best performance 1___2___3___4___5___

32. My team leader will not settle for second best	1___2___3___4___5___
33. My team leader shows respect for my personal feelings	1___2___3___4___5___
34. My team leader behaves in a manner thoughtful of my personal needs	1___2___3___4___5___
35. My team leader challenges me to think about old problems in new ways	1___2___3___4___5___
36. My team leader asks questions that prompt me to think	1___2___3___4___5___
37. My team leader has stimulated me to rethink the way I do things	1___2___3___4___5___
38. My team leader has ideas that have challenged me to re-examine some of my basic assumptions about my work	1___2___3___4___5___

Source: Zhang et al. (2011, p. 1606-1607)

Appendix B: Frequency tables per question

Cognitive diversity questions

CD1_B7 **To what extent do the members of your team differ on way of thinking**		
Answer options	**Frequency**	**Percentage**
To a very small extent	4	3%
To a small extent	16	10%
To a moderate extent	78	49%
To a large extent	52	33%
To a very large extent	8	5%
Total responses	**158**	
Completion rate	**100%**	

CD2_B8 **To what extent do the members of your team differ on composition of knowledge and skills**		
Answer options	**Frequency**	**Percentage**
To a very small extent	5	3%
To a small extent	28	18%
To a moderate extent	70	44%
To a large extent	46	29%
To a very large extent	9	6%
Total responses	**158**	
Completion rate	**100%**	

CD3_B9 **To what extent do the members of your team differ on views on the world**		
Answer options	**Frequency**	**Percentage**
To a very small extent	2	1%
To a small extent	15	9%
To a moderate extent	64	41%
To a large extent	61	39%
To a very large extent	16	10%
Total responses	**158**	
Completion rate	**100%**	

CD4_B10 To what extent do the members of your team differ on beliefs on what is considered right or wrong		
Answer options	**Frequency**	**Percentage**
To a very small extent	22	14%
To a small extent	63	40%
To a moderate extent	46	29%
To a large extent	21	13%
To a very large extent	6	4%
Total responses	**158**	
Completion rate	**100%**	

Team performance questions

TP1_B11 Under the team's leadership the unit has rapid revenue growth		
Answer options	**Frequency**	**Percentage**
Strongly disagree	3	2%
Disagree	25	16%
Neither agree nor disagree	53	34%
Agree	65	41%
Strongly agree	12	8%
Total responses	**158**	
Completion rate	**100%**	

TP2_B12 Under the team's leadership the unit has rapid profit growth or cost savings growth (if unit is a cost centre)		
Answer options	**Frequency**	**Percentage**
Strongly disagree	5	3%
Disagree	16	10%
Neither agree nor disagree	43	27%
Agree	83	53%
Strongly agree	11	7%
Total responses	**158**	
Completion rate	**100%**	

TP3_B13 Under the team's leadership the unit is slow in expanding major business		
Answer options	**Frequency**	**Percentage**
Strongly disagree	12	8%
Disagree	50	32%
Neither agree nor disagree	49	31%
Agree	41	26%
Strongly agree	6	4%
Total responses	**158**	
Completion rate	**100%**	

TP4_B14 Under the team's leadership the unit builds good relationships with stakeholders		
Answer options	**Frequency**	**Percentage**
Strongly disagree	1	1%
Disagree	9	6%
Neither agree nor disagree	13	8%
Agree	93	59%
Strongly agree	42	27%
Total responses	**158**	
Completion rate	**100%**	

TP5_B15 Under the team's leadership the unit enjoys good reputation in the local region		
Answer options	**Frequency**	**Percentage**
Strongly disagree	3	2%
Disagree	11	7%
Neither agree nor disagree	18	11%
Agree	90	57%
Strongly agree	36	23%
Total responses	**158**	
Completion rate	**100%**	

TP6_B16 Under the team's leadership the unit has high employee satisfaction		
Answer options	**Frequency**	**Percentage**
Strongly disagree	10	6%
Disagree	29	18%
Neither agree nor disagree	44	28%
Agree	60	38%
Strongly agree	15	9%
Total responses	**158**	
Completion rate	**100%**	

TP7_B17 Under the team's leadership the unit has high employee morale		
Answer options	**Frequency**	**Percentage**
Strongly disagree	10	6%
Disagree	31	20%
Neither agree nor disagree	33	21%
Agree	67	42%
Strongly agree	17	11%
Total responses	**158**	
Completion rate	**100%**	

Transformational leadership questions

TL1_B18 My team leader has a clear understanding of where we are going		
Answer options	**Frequency**	**Percentage**
Strongly disagree	4	3%
Disagree	10	6%
Neither agree nor disagree	26	16%
Agree	85	54%
Strongly agree	33	21%
Total responses	**158**	
Completion rate	**100%**	

TL2_B19 My team leader paints an interesting picture of the future for our group		
Answer options	**Frequency**	**Percentage**
Strongly disagree	4	3%
Disagree	11	7%
Neither agree nor disagree	25	16%
Agree	98	62%
Strongly agree	20	13%
Total responses	**158**	
Completion rate	**100%**	

TL3_B20 My team leader is always seeking new opportunities for the organization		
Answer options	**Frequency**	**Percentage**
Strongly disagree	4	3%
Disagree	10	6%
Neither agree nor disagree	36	23%
Agree	68	43%
Strongly agree	40	25%
Total responses	**158**	
Completion rate	**100%**	

TL4_B21 My team leader inspires others with his/her plans for the future		
Answer options	**Frequency**	**Percentage**
Strongly disagree	4	3%
Disagree	21	13%
Neither agree nor disagree	34	22%
Agree	73	46%
Strongly agree	26	16%
Total responses	**158**	
Completion rate	**100%**	

TL5_B22 My team leader is able to get others committed to his/her dream		
Answer options	**Frequency**	**Percentage**
Strongly disagree	4	3%
Disagree	21	13%
Neither agree nor disagree	33	21%
Agree	78	49%
Strongly agree	22	14%
Total responses	**158**	
Completion rate	**100%**	

TL6_B23 My team leader leads by 'doing', rather than simply by 'telling'		
Answer options	**Frequency**	**Percentage**
Strongly disagree	6	4%
Disagree	29	18%
Neither agree nor disagree	18	11%
Agree	77	49%
Strongly agree	28	18%
Total responses	**158**	
Completion rate	**100%**	

TL7_B24 My team leader provides a good model for me to follow.		
Answer options	**Frequency**	**Percentage**
Strongly disagree	8	5%
Disagree	18	11%
Neither agree nor disagree	24	15%
Agree	81	51%
Strongly agree	27	17%
Total responses	**158**	
Completion rate	**100%**	

TL8_B25 My team leader leads by example		
Answer options	**Frequency**	**Percentage**
Strongly disagree	6	4%
Disagree	14	9%
Neither agree nor disagree	23	15%
Agree	78	49%
Strongly agree	37	23%
Total responses	**158**	
Completion rate	**100%**	

TL9_B26 My team leader fosters collaboration among work groups		
Answer options	**Frequency**	**Percentage**
Strongly disagree	3	2%
Disagree	11	7%
Neither agree nor disagree	26	16%
Agree	93	59%
Strongly agree	25	16%
Total responses	**158**	
Completion rate	**100%**	

TL10_B27 My team leader encourages employees to be ‘team players’		
Answer options	**Frequency**	**Percentage**
Strongly disagree	3	2%
Disagree	6	4%
Neither agree nor disagree	13	8%
Agree	100	63%
Strongly agree	36	23%
Total responses	**158**	
Completion rate	**100%**	

TL11_B28 My team leader gets the group to work together for the same goal		
Answer options	**Frequency**	**Percentage**
Strongly disagree	3	2%
Disagree	9	6%
Neither agree nor disagree	16	10%
Agree	104	66%
Strongly agree	26	16%
Total responses	**158**	
Completion rate	**100%**	

TL12_B29 My team leader develops a team attitude and spirit among employees		
Answer options	**Frequency**	**Percentage**
Strongly disagree	5	3%
Disagree	13	8%
Neither agree nor disagree	32	20%
Agree	85	54%
Strongly agree	23	15%
Total responses	**158**	
Completion rate	**100%**	

TL13_B30 My team leader shows us that he/she expects a lot from us		
Answer options	**Frequency**	**Percentage**
Strongly disagree	2	1%
Disagree	11	7%
Neither agree nor disagree	16	10%
Agree	84	53%
Strongly agree	45	28%
Total responses	**158**	
Completion rate	**100%**	

TL14_B31 My team leader insists on only the best performance		
Answer options	**Frequency**	**Percentage**
Strongly disagree	2	1%
Disagree	8	5%
Neither agree nor disagree	25	16%
Agree	74	47%
Strongly agree	49	31%
Total responses	**158**	
Completion rate	**100%**	

TL15_B32 My team leader will not settle for second best		
Answer options	**Frequency**	**Percentage**
Strongly disagree	3	2%
Disagree	18	11%
Neither agree nor disagree	29	18%
Agree	74	47%
Strongly agree	34	22%
Total responses	**158**	
Completion rate	**100%**	

TL16_B33 My team leader shows respect for my personal feelings		
Answer options	**Frequency**	**Percentage**
Strongly disagree	5	3%
Disagree	17	11%
Neither agree nor disagree	27	17%
Agree	73	46%
Strongly agree	36	23%
Total responses	**158**	
Completion rate	**100%**	

TL17_B34 My team leader behaves in a manner thoughtful of my personal needs		
Answer options	**Frequency**	**Percentage**
Strongly disagree	8	5%
Disagree	8	5%
Neither agree nor disagree	25	16%
Agree	81	51%
Strongly agree	36	23%
Total responses	**158**	
Completion rate	**100%**	

TL18_B35 My team leader challenges me to think about old problems in new ways		
Answer options	**Frequency**	**Percentage**
Strongly disagree	7	4%
Disagree	12	8%
Neither agree nor disagree	27	17%
Agree	78	49%
Strongly agree	34	22%
Total responses	**158**	
Completion rate	**100%**	

TL19_B36 My team leader asks questions that prompt me to think		
Answer options	**Frequency**	**Percentage**
Strongly disagree	7	4%
Disagree	15	9%
Neither agree nor disagree	9	6%
Agree	93	59%
Strongly agree	34	22%
Total responses	**158**	
Completion rate	**100%**	

TL20_B37 My team leader has stimulated me to rethink the way I do things		
Answer options	**Frequency**	**Percentage**
Strongly disagree	7	4%
Disagree	13	8%
Neither agree nor disagree	21	13%
Agree	90	57%
Strongly agree	27	17%
Total responses	**158**	
Completion rate	**100%**	

TL21_B38 My team leader has ideas that have challenged me to re-examine some of my basic assumptions about my work		
Answer options	**Frequency**	**Percentage**
Strongly disagree	5	3%
Disagree	14	9%
Neither agree nor disagree	26	16%
Agree	90	57%
Strongly agree	23	15%
Total responses	**158**	
Completion rate	**100%**	