Linking leader-member exchange, work engagement, project success and turnover intentions of construction project managers

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A research project submitted to the Gordon Institute of Business Science, University of Pretoria, in partial fulfilment of the requirements for the degree of Master of Business Administration.

07 November 2018

ABSTRACT

The study aimed to identify linkages between leader-member exchange, project success and the turn over intentions of construction project managers in the South African construction industry. The role of work engagement as a mediator was tested within these linkages. This quantitative cross-sectional research study examined the views on LMX, work engagement, project success and turnover intention of 209 project managers active in the construction industry.

A structural equation model and a hierarchical linear regression were carried out to test the hypothesis. The results of the study found significant positive relationships between LMX and work engagement, between work engagement and project success, and a significant negative relationship between work engagement and turnover intentions. Work engagement was also identified as a mediator in the relationship between LMX and projects success and the relationship between LMX and turnover intention.

Companies operating in the construction industry are challenged more and more to deliver successful projects as projects make up a large part of business revenue, this indicates to a greater need to investigate the factors that influence project success. The study examined the relationship between managers and project managers involved in the construction industry who ultimately affect project outcomes. The outcomes of the research confirm the importance of the relationship between leaders and their subordinates and the importance of fostering work engagement with employees.

KEYWORDS

Construction project managers, Leaders Membership Exchange (LMX), Work Engagement, Intention to Turnover, Project Success

Gordon Institute of Business Science
University of Pretoria

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 (MBA) 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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Dérik Ritchie

07 November 2018

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1 CHAPTER 1: INTRODUCTION TO RESEARCH PROBLEM

1.1 RESEARCH TITLE

Linking leader-member exchange, work engagement, project success and turnover intentions among construction project managers.

1.2 INTRODUCTION TO THE PROBLEM

It has become a common occurrence for employees to work in temporary teams and temporary organisational structures. Employees are facing challenges that are associated with these temporary organisations. Research has proven that the execution and the outcomes of projects are essential and that these outcomes make an impact on the organisation itself and organisational results (Albert, Balve, & Spang, 2017; Martens & Carvalho, 2016). Projects are an essential part of the existence of many companies these days. Projects are no longer small tasks that can be completed casually. In many instances, the sustainability of companies is reliant on how well they can deliver successful projects (Albert, Balve, & Spang, 2017b; Martens & Carvalho, 2016).

The importance of successful projects and employees are becoming ever more critical to the sustainability of businesses. Employees are vital for the existence of companies and have a significant impact on the operation of most businesses. The human factor is just something that companies cannot exclude from their daily activities. As the human factor is such a significant element in companies, the importance of the relationships that exist in the structures of industry between employees is becoming more evident. How well employees' function within the business has an impact on the level and quality of output the business delivers. There is a growing need to understand the influence a supervisor has on the relationship between him/her and his/her subordinates and how this influences the work engagement of employees and the outputs of the business. Research studies have shown that the relationship that forms between leaders and employees are vital and that the type of relationship and the quality of the relationship influences an employee's future career decisions (Covella, Mccarthy, Kaifi, & Cocoran, 2017).

Companies are becoming more and more to the realisation that without engaged employees they are bound for failure (Agarwal, Datta, Blake-Beard, & Bhargava, 2012). The ability to attract and retain skilled human capital of vital importance to modern businesses (Covella et al., 2017). Employee engagement has been proven to be critical to the survival, sustainability, and the development of an organisation. For these reasons, organisational leaders are cultivating this among employees. It is, therefore, a key concern for organisations to understand how to evaluate, improve, sustain work engagement and commitment (Knight, Patterson, & Dawson, 2017a).

Employee engagement is an expanding field of research. Increasing employee engagement is a challenge faced by most managers, and it is a very complex undertaking to resolve (Agarwal et al., 2012). Managers are facing the conundrum of how to retain the best professional talent, how to keep this talent engaged to reduce the intention to turnover and how to achieve success (Agarwal et al., 2012). There is a continuous drive amongst managers and executives to understand the factors that stimulate employee engagement (Macey, Schneider, Barbera, & Young, 2012).

According to research done by Bowen, Edwards, and Lingard (2013), the construction industry is an industry with high levels of work-related stress. Construction projects are characterised by a stressful nature due to various factors, e.g. a dangerous work environment, fluctuations in the economy, deadlines, high levels of uncertainty and considerable dynamism.

In South Africa where skills are scarce, the loss of skilled employees can be detrimental to the performance of a business no matter what the industry. It is especially prevalent in the South African construction industry where there is a massive skills shortage (Windapo, 2015). Firms that are involved in the South African construction industry will be in a much better position if they can form an understanding of the behaviour that takes place within their organisations and the behaviours that leads to employee turnover. Employee turnover is identified as a significant and expensive contributor to the loss of institutional knowledge (Bowen et al., 2013).

Achieving project success and reducing the turnover intention of staff are hot topics and numerous debates have been held with regards to these topics. This research project is limited to project managers who work for firms that have an interest in the South African construction industry. A greater understanding needs to be formed on how the quality of the relationship between supervisors and subordinates impacts on businesses activities of firms

in the construction industry. Companies are also under pressure to understand the work engagement of construction employees and the chances of delivering successful construction project outcomes.

Previous research studies conducted in the United States of America among employees from a wide variety of industries have indicated that leader-member exchange and employee work engagement can act as mediators when it comes to the turnover intentions of employees (Covella et al., 2017).

The research contained in this document can be utilised by companies who operate in the South African construction industry and companies who have an interest in the delivery of projects that has a construction element to them. The research can be to companies who must deliver projects on a regular basis and who has a keen interest in how to improve the chances of achieving successful projects while maintaining their staff. Therefore, it is possible to infer that the research will have a constructive influence on forming greater understating of the human resource value chain of project manager employers. The outcomes of the study can be used to improve the recruitment and selection strategy of a business and to improve the retention, training and development strategy of companies.

The research document is structured into seven chapters. The first chapter discusses the introduction to the research problem and the purpose. The second chapter focusses on the theory and literature applicable to the study. The third chapter defines the research questions derived from the existing literature, and the fourth chapter focuses on the proposed research methodology and design. The fifth and sixth chapters present the results of the data analysis and discuss these results. The final chapter includes the conclusion derived from the data.

1.3 RESEARCH PROBLEM

The research study focused on examining the relationships between leader-member exchange (LMX), project success and turnover intention. The study aimed to explore if work engagement has a mediating relationship with LMX, project success and turnover intention.

The study makes theoretical contributions in three ways. It explores if LMX contributes to work engagement and if LMX can further influence project success and intention to turnover among construction project managers. By identifying work engagement and LMX as antecedents of

project success, it extends research in this domain. These outcomes are essential to the sustainability of businesses that operate in the construction industry.

The introduction of a work engagement model contributes to the field of work engagement (Figure 1). Research by Macey and Schneider (2008) identified that the type of relationship and the quality of the relationship between a supervisor and an employee has an influence on fostering engagement with employees and by linking psychological concepts in unique combinations helps to better predict the chances of project success and turnover intention (Du Plooy & Roodt, 2010).

The proposed model (figure 1) is embedded in the existing Job-demand resource model. The model enables the mapping of organisational attitudes and the impact thereof on outcomes such as project success and turnover intention.

1.4 RESEARCH PURPOSE

The research aims to form a greater understanding of linkages between leader-member exchange, work engagement, project success and turnover intention. Companies operating in the construction industry is continuously faced with the challenge of delivering successful projects, and if this is not enough, they are a constant battle to maintain talented staff in an industry with a massive skill shortage. Management is in a balancing act of delivering on their commitments while keeping staff engaged. By understanding the linkages between the constructs better and the aspects that have an impact on these construct, management is placed in a better position to plan and make an informed decision that is beneficial to the sustainability of the business.

The research endeavours to build on existing literature in the leadership and work engagement fields of study and to provide management with a theoretical contribution that allows them to assess and address daily management challenges.

2 CHAPTER 2: THEORY AND LITERATURE REVIEW

2.1 THEORETICAL UNDERPINNING

2.1.1 The Construction Industry

The South African Construction Industry has over the years been a key contributor to the South African economy (Windapo & Cattell, 2013). The industry employs workers both skilled and semi-skilled (Clinton, Emmanuel, & Denzel, 2016). One of the key challenges the industry faces is the skills mismatch that exists within the South African job market (Windapo & Cattell, 2013). In 2016 the South African construction industry experienced a deceleration in its growth. The sector decelerated to 4.8% in 2016 after a peak of 15.25% in 2015. In 2016 the total value of the industry in dollar value was an estimated value of $ 11979 million (Marketline Industry Profile, 2017). The decline in the industry was predominantly contributed to the slowdown in the South African economy. The downturn was a result of the decrease in the demand for commodities worldwide. Mining activities are the biggest client in industrial construction (Marketline Industry Profile, 2017).

In 2016 the construction industry accounted for approximately 3.08% of the country's GDP. The different services offered by firms that operate in the construction industry ranges from design to project management to specific building skills, and this helps to enhance the differentiation in the construction industry.

Marketline (2017) defines the construction industry in South Africa as the " value of work put in place in the residential and non- residential segments (p.7)". The definition excludes all civil engineering related work. The construction industry is divided into two segments namely the residential construction market and the non-residential construction market. The residential construction market as defined by Marketline (2017) is the " value of work put in place annually for residential buildings"(p.7). The definition includes buildings such as apartments, houses and any similar buildings but it excludes buildings such as hotels and lodges. The definition of market value includes " new build, renovations and repairs. It also includes the construction of buildings and the preparatory work and completion (demolition, site preparation, electrical and plumbing installation etc." (Marketline Industry Profile, 2017,p.7). The non – residential

construction market is defined as the “value of non-residential buildings constructed, and it typically includes but is not restricted to buildings for retails, commercial, manufacturing, and educational purposes” (Marketline Industry Profile, 2017,p.7).

The market rivalry of the South African construction industry is described as “being accumulated in segments and niche markets, in which players’ operations are similar. The industry is mainly fragmented in the residential construction segment, while a few large players dominate in the non-residential segment” (Marketline Industry Profile, 2017,p.2). The construction industry has been described as having high capital barriers to entry and the ability to create large economies of scale and having a wide range of competencies such as design and project management has proven to be essential (Windapo & Cattell, 2013). The tendency in the construction industry has been to diversify into the different industry segments as the firms operating in these segments requires similar competencies in delivering the result to the end user. Due to the nature of the industry, it is easy for industry players to change their output up and down when required as firms can employ individuals per project base when and if needed.

Many researchers have explored the antecedents and outcomes of performance differentials and these performance differentials themselves, but there is a scarcity of empirical research within the construction industry when it comes to the performance of businesses and the management of projects (Oyewobi, Windapo, & Rotimi, 2016). It is of crucial importance for construction firms and project management firms to remain relevant in an industry that is continuously moving and changing and as the industry is hyper-competitive more, and more firms are endeavouring to improve their performance continually (Oyewobi et al., 2016). Most studies in the construction industry have focused on the experiences of workers in industrialised countries as those countries of Western Europe, Australasia, the United States, and East Asia.

According to Zafar et al. (2012), characteristics of the construction industry is the deadlines, time constraints and high levels of workload. Like other industries, high levels of work stress results in lower levels of job performance among construction industry employees. These high levels of stress are often the outcome of construction industry job demands such as multitasking. Many construction industry employees are expected to have the ability to multi-task on various projects. “Few construction industry professionals enjoy the luxury of engaging

in only one task on one project only, and many of the tasks have interrelated dependencies, thus rendering the professional work itself as complex as the projects on which it is performed"(Bowen et al., 2013).

2.1.2 Project Management

Development in theory and practice over time has resulted in placing the project manager at the centre of projects, project success and organisational success (Loufrani-Fedida & Missonier, 2015). The project managers ability to identify the critical success factors on a project increases the chances of success on a project. Project managers that can detect these factors in advance increase the opportunities of delivering a successful project (Blaskovics, 2016; Albert et al., 2017). Albert et al., (2017) indicates that it is imperative to comprehend the difference between success factors and success criteria. Albert et al., (2017) citing Ashley et al.,(1987), Muller and Jugdev, (2012) has the following view: "Success factors through which a project manager can increase the likelihood of completing a project successfully are not explicitly defined levers available to him or her during the implementation of a project" (Albert et al., 2017 p.798). Albert et al., (2017) points out that "success criteria are used to assess the success of a project" (p.798) and that it is imperative to note that a cause-effect relationship exists between the factors that drive success and the success criteria of project success. Blaskovics (2016) highlights that the interrelationship which exists between the project manager attitude, the leadership style and the personal characteristics as key critical success factors that influences the success of a project. Munns and Bjeirmi (1996) identified key factors that contribute towards the failure or the success of a project. The factors were identified as inappropriate project scope definitions, inappropriate project communication and the lack of appropriate project management competencies. Other significant factors that influence the success or failure of a project is identified by Blaskovics as the characteristics of an organisation, the "applied project management methodology at play, project management expertise, tools and infrastructure" (p.262).

The project manager is seen as the modern day "hero" who is responsible for ensuring project success (Loufrani-Fedida & Missonier, 2015). The project manager fulfils a critical role in the project life cycle and according to Bowen et al., (2013, P.400) "the overarching interest of these project and construction managers is time regarding planning and organising construction activities in the face of technology and resource constraints". Project management these days include the planning of projects, the implementation phase, the

management of stakeholders and delivering beneficial change. Therefore an acceptable definition of project management can then be the “application of knowledge, skills, tools, and techniques to project activities to meet the project requirements ”(Blaskovics, 2016, p.263). Blaskovics (2016) further indicates that it is essential that the management of business need to be aware of the engagement and job satisfaction of their project managers as this can impact on the outcome of projects and ultimately the success of the business.

2.1.3 LMX Theory

For many decades Leader-member exchange theory has been an exciting topic of discussion (Martin, Thomas, Charles, Epitropaki, & McNamara, 2005; Matta, Scott, Koopman, & Conlon, 2015; Pierce & Newstorm,2006). The LMX framework has been very influential in forming an understanding of leadership and the effects of leadership on followers. LMX theory is different from other leadership theories as LMX core tenet is grounded on the view that leaders develop differential relationships with subordinates and that the quality in these differences has significant consequences for follower outcomes (Dansereau, Graen, & Haga,1975). Liden, Erdogan, Wayne, and Sparrowe (2006) define LMX as the different types and levels of relationships leaders develop with their respective direct reports. The quality of relationships between leaders and their direct reports are influenced by the attitudes and behaviours of leaders and members. Leader-member exchange has also been defined as the consensus that exists between a leader and subordinate perceptions (Matta et al., 2015). Leader-members exchange theory is a dyadic leadership theory and to form a good understanding of this; it is important to explore both the perspective of the leader and the subordinate. It is a topic that has been discussed extensively and has formed part of numerous research studies. LMX relationship includes a variety of connections such as socio-emotional relationships and transactional relationships with others. Covella et al., (2017, p.2) describes LMX as the “means of negotiation that leaders provide to subordinates in exchange for the desired behaviour or work outcomes”.

Early research studies on the behaviours of leaders and their interactions with their subordinates took a broad approach where the subordinate relationships and the assumptions that were made with regards to these relationships were homogenous across organisations. As research developed over the years, the point of view changed, and meta-analytic studies confirmed that LMX is an important topic. Research indicates that LMX is a dyadic relationship and that the quality of this relationship forms a critical link with outcomes. LMX research studies also suggest that the LMX relationship between a supervisor and subordinates impacts

on the attitudes of employees, the job performance of employees and an employer's ability to retain these employees (Matta et al., 2015). Meta-analytic studies have also shown that the turnover intentions of staff are affected by the LMX agreement between a supervisor and a subordinate (Covella et al., 2017).

Matta et al., (2015) indicates that most studies that explore the LMX domain study the antecedents and consequence thereof from only one side of this dyad relationship. Matta et al., (2015) argues that it is necessary to view an LMX relationship from both sides of the dyad relationship and that this will result in a holistic view of the LMX relationship. Research indicates that leaders and subordinates on many occasions may not agree on the quality of their LMX agreement and that by only exploring the LMX relationship from the perspective of one of the parties involved can be a fatal error as an essential part of the overall LMX agreement is being omitted. Matta et al., (2015) view are contradictory to other studies as most key studies have predominantly evaluated the perceptions from only one side. Existing research finding shows that the perceptions of the relationship between a leader and subordinates only differ on average 8 - 13%(Gerstner & Day, 1997). Based on the literature leaders should be careful and make the effort to learn the ability to identify the type of relationship that exists between themselves and their subordinates, they should also learn to manage the relationship and be aware of not forcing their dominate LMX relationship down on their subordinates resulting in rendering their subordinate perspectives irrelevant (Griep, Vantilborgh, Baillien, & Pepermans, 2016).

The self-perception a leader develops, and the self-perception an employee develops is critical to the level of the LMX agreement that exists between the leader and the employee. Kahn (1990) has suggested that the self-perception of the employee is of greater importance in the LMX relationship than that of the leader. Matta et al., (2015) identified through research that the work engagement of a subordinate is lower when the leader's perception of the LMX quality is higher than the subordinate's perceptions. Further to this role theory also suggest that an employee is likely to behave in such a way as to what is consistent with the way the employee's role evolves and is defined. The roles of an employee are likely to expand or contract depending on the way an employee applies their resources; on what they perceive to be key tasks and the social expectations of the role they fulfil (Kahn et al.,1964; Katz & Kahn, 1978). Therefore, it can be inferred that because of the LMX relationship an employee has with his or her leader that the employee is likely to expand or contract their role.

2.1.3.1 LMX Theory in the Construction Industry

Limited research exists on Leader-member exchange in the construction industry. The construction industry has been identified as a high turnover environment and studies conducted by Morrow, Suzuki, Crum, & Ruben (2005) into the role of leader-member exchange in high turnover work environments indicates that the involvement of a supervisor in the day to day activities of an employee does have a meaningful role in the voluntary turnover decisions of employees. Good relationships between supervisors and subordinates lead to the subordinate being embedded within the organisation, and this serves as a deterrent for employees to leave their work (Morrow et al., 2005).

Bowen et al., (2013) conducted a study which confirmed that stress levels are high under construction related professionals such as architects, civil engineers, quantity surveyors, and project and construction managers in South Africa. Evidence from the study indicated that the high-stress levels are due to tight project deadlines, long working hours and the challenges involved in achieving project success outcomes. Research findings by Loosemore and Galea, (2008) indicated that high levels of interpersonal and inter-role conflict which is known as work stressors exist among employees in the construction industry and it is for this exact reason that further investigation into the interpersonal and inter-role strife that exists between subordinates and their managers are required.

2.1.4 Work Engagement

Work engagement is a popular discussion point that has received a lot of attention over the past few years, and numerous studies have been conducted in this field of study with different outcomes to such an extent that some studies have delivered contradicting results (Du Plooy & Roodt, 2010).

“Kahn (1990) originally pioneered the concept of employee engagement, proposing that engaged employees are physically, cognitively and emotionally involved in their work roles, and experience a sense of meaning (reward for investing in role performance), psychological safety (a sense of trust and security at work) and availability (a sense of having the physical and psychological resources necessary for the job)” (Knight et al., 2017 p.793).

Work engagement forms part of the larger sphere of Employee Engagement. Employee work engagement as a concept has been identified as “engagement is a discretionary effort, achieved through the behavioural investment of physical, cognitive, and emotional energy in work roles”(Agarwal et al., 2012). Ashforth and Humphrey (1995) have a slightly different perspective. They define engagement as investing “hands, head and heart” (p.110) in one’s work. “Saks (2006) developed his view by distinguishing between work and organisational engagement to reflect the different roles of employees” (Knight et al., 2017,p.793).

Macey et al., (2012, p.204) identified through their research that work engagement has a stronger alignment with personal aspects and factors compared to the broad policies and the practices where the worker is employed. An important feature of work engagement is the fact that work engagement is an antecedent of any persons work performance (Macey et al., 2012). Work engagement is a psychological construct which has its routes grounded in Job Demand - Resource theory and evidence-based theory. The motivation potential of a person’s work and the access to personal resource and the ability of a person to utilise these resources can lead to positive personal and organisational outcomes. Example of these outcomes is wellbeing and performance (Schaufeli, Martínez, Pinto, Salanova, and Bakker, 2002, p.465).

Over time authors and researchers have approached engagement from different angles. Maslach and Leiter (1997) explored the field of work engagement from an exhaustion perspective characterising engagement by the levels of energy, involvement, and efficacy. These constructs are the polar opposite of burnout which is characterised by exhaustion, cynicism, and inefficacy (Knight et al., 2017 p.793). The Job Demand -Resources model was pioneered by Schaufeli et al., (2002, p.465) and their definition is still widely accepted. Schaufeli et al. (2002, p. 465) define work engagement as “positive, fulfilling, work-related state of mind characterised by vigour, dedication, and absorption.” Opie and Henn, (2013) citing Bakker and Demerouti (2009) states that vigour discusses to the mental resilience and the high energy levels an employee will show while carrying out their work. Employees with vigour are prepared to devote energy to their work and are dogged even when they are faced with problems. Dedication refers to an employee’s sense of significance, the enthusiasm, inspiration, pride, and challenges the employees to link to their work. The absorption of an employee refers to the level of concentration and how deeply an employee is engrossed in their work (Agarwal et al., 2012,p.210). Personal, contextual and organisational factors have been proven to affect the work engagement of employees (Chrupala-Pniak, Grabowski, &

Sulimowska-Formowicz, 2017) and this has had a profound influence on the job performance of individuals.

Schaufeli et al. (2002) Job Demands-Resources model suggest that the work engagement of employees is predominantly driven by two factors which can exist either independently or together. The two factors are job and personal resources. Chrupala-Pniak et al., (2017) has built even further on this view and has formed the opinion that work pressure, emotional demands and role ambiguity are key factors that affect the job demands of an employee. Job resources are influenced by social support, performance feedback and autonomy. All these key drivers can result in higher employee engagement and organisational commitment. Personal resources have been recognised as the personal resources that have linkages to positive self-evaluation and resiliency (Knight et al., 2017). Personal resources also refer to an individual's capability to effectively manage or influence their environment (Knight et al., 2017; Lee, Kwon, Kim, & Cho, 2016). Job or work "resources refer to the physical, social or organisational" (Knight et al., 2017,p.793) resources an individual has available to them to reduce the demands of the job, help achieve targets and at the same time encourage learning and development (Knight et al., 2017). Other key factors that drive engagement has been identified as "pride, confidence, working pleasure and challenge in the work area" (Taneja, Sewell, & Odom, 2015,p.48). Key findings by Chrupala-Pniak et al., (2017) in their research is that trust propensity and situational trust affects work engagement. Therefore, it can be inferred that the trust that is formed between a leader and a subordinate during the LMX relationship will influence the work engagement of an employee and possibly the manager.

Research suggests that it is possible to reliably measure work engagement (Schaufeli, Bakker, & Salanova, 2006). The Utrecht Work Engagement Scale has been identified as a validated measure of work engagement (Knight et al., 2017). Research by Knight et al. (2017) has indicated that engaged employees enjoy better health as well as positive work affect. The findings of their study also reported that lower levels of work engagement in employees lead to decreased well-being and decreased work performance. Fairlie (2011) has found that a strong correlation exists between the predictors and the essential characteristics of employee engagement, job satisfaction, burnout, organisational commitment, and turnover cognitions.

It is evident in research that there are similarities in the key constructs of job satisfaction and work engagement. Some of the similarities are the effective and cognitive components which affect the attitudes and behaviours of employees. Rezvani et al., (2016) indicates that the job satisfaction of project managers do impact on their performance in the carrying out of their

responsibilities and that their job satisfaction also impacts on their turnover intentions and it is the view of the researcher that higher levels of turnover intention impacts on project success. Schaller and Cialdini (1990) identified that an increased tendency exists among project managers to look for more social interactions such as communication with stakeholders and having greater involvement in activities the higher their engagement levels are, and research indicates that this increases the chances of project success. Because of this, there is the expectation that the outcomes of engaged project managers lead to project success.

Other factors that affect work engagement has been identified as interpersonal trust, organisational trust building competence and motivation (Chrupala-Pniak et al., 2017). An interesting conclusion by (Chrupala-Pniak et al., 2017) is their perspective that the "more a manager is involved in his role as supervisor using available mode of influence/pressure on team members, the autonomously motivated, and so engaged are the team members" (p.40). This raises an interesting point and leads the researcher to question what the outcomes would be of the different LMX relationship a supervisor has with his team members?

Chrupala-Pniak et al., (2017) also point out that from previous research that different strengths relationships between managers and subordinates and the level of trust that exist between them will affect the motivation and work engagement of an employee. Further to this their research indicates that organisational trust does not have the same outcomes as trust in one's manager. Their research results showed that organisational trust with situational trust is weak predictors of work engagement and that organisational trust is an outcome of work engagement and not an antecedent (Chrupala-Pniak et al., 2017). Personal Work engagement has been found to be a key driver in the decision-making process when an employee decides how to best utilise and develop resources. Another outcome of work engagement has been identified as turning organisational competencies in positive organisational outcomes, and therefore it drives the question if it has a mediating effect on LMX and positive organisational outcomes such as project success?

2.1.5 LMX and Work engagement

As identified earlier LMX 's core tenet is grounded on the view that leaders develop differential relationships with subordinates and that the quality in these differences has important consequences for follower outcomes (Dansereau, Graen, & Haga,1975). Covella et al., (2017, p.2) describes LMX as the "means of negotiation that leaders provide to subordinates in exchange for the desired behaviour or work outcomes."

Graen and Scanduara (1987) who are some of the early pioneers of LMX theory did some great work in the field of LMX as they were the first ones to suggest that based on role theory that the quality of an LMX relationship can be positively linked to the work engagement of an employee. LMX theory has been related to several other constructs such as employee's work satisfaction, the organisational commitment of employee 's, the perceptions of employees and the task performance of employees (Breevaart, Bakker, Demerouti & Van den Heuvel, 2015; Dulebohn et al. 2012). "A wealth of literature exists on the effects of LMX on follower outcomes. However, little research is available on the procedure through which LMX influences follower outcomes" (Breevaart et al., 2015,p.755). High-quality levels of LMX relationship does not only result in the work engagement of employees but also indirectly influence the organisation at large. Research studies have indicated that LMX quality correlates positively with key factors such as "follower satisfaction, organisational commitment, role clarity, workgroup cohesiveness, organisational climate, leader power, performance ratings by leaders and objective performance" (Kumar & Singh, 2012,p.7). Previous research also indicates that LMX negatively correlates with "role conflict and turnover intentions" (Kumar & Singh, 2012).

Matta et al. (2015), took a comprehensive look at the LMX theory in their paper "Does seeing "eye to eye" effect work engagement and organisational citizenship behaviour? A role theory perspective on LMX agreement" (p.1686) and their findings are conclusive that LMX agreement is an important construct. The findings explained additional variances in employee engagement because of LMX quality. Inversely a low-quality LMX relationship between a manager and subordinates leads to less safety and less engagement of employees and this should be of significant interest to those who aim to further organisational goals. Matta et al., (2015) draw upon previous literature to argue that an employee's work engagement will either increase or decrease depending on the type of LMX relationship that occurs between a leader and that employee. These arguments are predominantly built on a role theory perspective where role theory is defined as " the more consensus a group of employees has on the expectations for the own and the positions of other the more members of a group will derive from the occupancy of their positions" (Gross, Mason & McEachern, 1958,p. 213). Matta et al. (2015) provide evidence that LMX relationship between a supervisor and subordinates influences the attitudes of employees, the job performance of employees and an employer's ability to retain these employees.

Matta et al., (2015) indicates that high-quality LMX relationship between leaders and subordinates lead to higher engagements of employees which can convert into greater chances for organisational citizenship behaviour resulting in the greater chance of corporate success. The findings of their research indicated that high-quality LMX agreement is directly related to an employee's work engagement and this is more likely to happen when both the parties in the dyad relationship perceive their roles and responsibilities similarly. A significant inference that can be drawn from these findings is that unaligned expectation discrepancies between leaders and subordinates will also be detrimental to the work engagement of employees.

Christian et al., (2011) has through meta-analytic research established that a positive correlation is present between LMX quality and work engagement. Breevaart et al. (2015) determined that the relationship between LMX and an employee's performance at work is mediated by the work engagement of the employee proving that job performance is an outcome of LMX. The extent to which an employee perceives the LMX relationship affects the employee's feelings of positivity and attitudes towards their job. Breevaart et al., (2015) found that resourceful work environments positively contribute to high-quality LMX relationships and that increased capable work environments, in turn, support high levels of work engagement and job performance and this has a positive impact on project success.

Different approaches have been taken to analyse LMX. Matta et al., (2015) has approached it from a role theory perspective and has contended that the quality of the relationship that exists between a manager and a subordinate has a meaningful impact on the motivation and the behaviour of an employee. Higher levels of work engagement have been associated with high-quality Leader-member exchange agreement between managers and employees. Graen and Scandura (1987) points out that an employee will receive more – work-associated benefits from their leaders the higher the quality of the LMX relationship and as LMX is a dyad relationship (Emerson, 1962) role theory has also suggested that work engagement will decrease as the perceived quality of the LMX relationship diverge. Research indicates that leaders and subordinates on many occasions may not agree on the quality of their LMX agreement and that by only exploring the LMX relationship from the perspective of one of the parties involved can be a fatal error as a vital part of the overall LMX agreement is being omitted. Members of an LMX agreement can view the quality of the relationship differently, for example, one member of the relationship can see the relationship as transactional while the other see the relationship as socio-emotional. Because of this misalignment, the expectation of the members will be different resulting in expectation discrepancies leading to the diversion

of attention, causing uncertainty and the consumption of resources as this prohibits an employee from feeling and becoming connected, integrated and focussed on their roles. Therefore, a leader would want a high-quality LMX agreement with his/her employees as this will result in higher work engagement levels from his/her employees, this possibly results in increasing the chances of success on organisational outcomes such as project success.

2.1.6 Project Success

Project outcomes are key drivers to organisational outcomes. The success of projects can have a determining impact on the existence and sustainability of businesses. Overtime projects have become more complex, and the challenges associated with projects are substantial. Literature provides evidence that project success has different meanings for different stakeholders and it has been identified through research that context does affect these perceptions. Organisations from different industries may interpret success differently. Literature also indicates that those different factors affect success outcomes in various industries and projects. Project success has been acknowledged as being a multidimensional concept. (Albert et al., 2017)

What is, however, indisputable is the fact that project success is key to the continued existence of a business no matter the industry. It is therefore vital to comprehend what project success is, the factors that influence project success and how to ensure project success. Numerous research studies have been done on project success and the factors that affect the outcomes of a project. Projects have shifted from being unique tasks (Olsen 1971) to being seen as a temporary organisation or entities (Lundin & Söderholm, 1995). Blaskovics,(2016 p.263) citing Görög (2013, p9) defines a project as "… Projects are one- time, complex and unique set of activities carried out in a project organisation with time and budget constraints, and they have a predefined result to be implemented"(p.263).

Initially, project success only focussed on the traditional project triangle which includes time, cost and quality. These factors are known as hard factors. Over time this view has developed further to include soft factors such as the satisfying of stakeholder interests and the strategic aspects of the client and this created a drive to form a greater understanding of the interrelationships between the components of project success, the criteria for success and the factors that are critical to success (Albert et al., 2017; Blaskovics, 2016)."Organisations define

more and more of their activities as projects, projects continue to fail in large numbers, and organisations demand faster and cheaper solutions. Consequently, both the demand for project managers and the interest in project management competencies are increasing"(Loufrani-Fedida & Missonier, 2015, p.1220).

Literature also indicates that project success can be achieved even if the project was managed ineffectively. Albert et al., (2017) forms the opinion that project success is achieved once a project is executed in terms of time, budget and performance. Contrary to this other researchers indicate that project success entails more than just performance in terms of cost, timelines, and deliverables (Rezvani et al., 2016). Various factors can have an impact on project success. Molenaar, Javernick-Will, Bastias, Wardwell, and Saller (2012) found that peer reviewing a project increases the chances of project success. Other factors which are conducive to the success of projects are factors referring to people such as the employee's engagement, work engagement, the commitment of project team members, the sense of responsibility of team members for project outcomes, the motivation of team members and the atmosphere of commitment (Haffer & Haffer, 2016). Additional criteria identified for the measuring of project success is the end user's satisfaction, company outcomes and if a competitive advantage is achieved. It is also imperative to consider the outcomes of a project over both the short term and the long term. The long-term success is particularly relevant to projects in the construction industry. Features of construction industry projects are big capital investment and long-term utilisation of the product. A project can be divided into phases or sections. Phase success can be achieved, but this does not necessarily convert into project success.

2.1.7 Project Success and Project Management

Blaskovics (2016) citing Görög (2013) states that the role of project managers has developed over time along with the changes in the concept of what project success is. Initially, projects were defined as unique tasks, and the function of a project manager solely focused on the process of the project. The responsibility of project managers included managing the implementation process while being mindful of the projects results, time and cost constraints. Through time as the definition and concept of what a project is has developed these changes resulted in the role change of the project managers. Shenhar, Dvir, Levy, and Maltz, (2001) present projects as "powerful strategic weapons that are initiated to create economic value and competitive advantage" in their research titled "Project Success: A multidimensional Strategic Concept" (p.699). Project managers are further suggested to be the strategic

leaders, who are responsible for project results (Shenhar et al., 2001) A key consideration of project success is if the project has met the expectations of the stakeholders. Thus "project management success encompasses the efficiency of project delivery, while project success embodies the effectiveness of project delivery" (Blaskovics, 2016, p.264). These definition and view lead the researcher to agree with the view of Shenhar et al.,(2010) that project success can be viewed as a strategic management concept. When projects success is seen as "a strategic management concept it helps to align project efforts with the short – and long-term goals of the organisation" (Shenhar et al., 2001,p.699).

2.1.8 Leader-member exchange and project success.

As projects are multidimensional and project success can have different meanings to different stakeholder, it is important to narrow the definition down. Project success has been dived into two key components by project success scholars namely critical success factors and success criteria (Todorović, Petrović, Mihić, Obradović, & Bushuyev, 2015). Factors that are included in success criteria is the focus on timeliness, quality, and cost. Project critical success factors focus on soft skills; it includes skills such as the behavioural skills of the role players that are involved in projects. LMX is a behavioural action, and for this reason, it forms part of the soft skills and the critical success factors of a project. Albert et al., (2017) citing Müller and Jugdev (2012) indicates the hard criteria of project success has been found to count for 50 per cent of project success. The other 50 per cent is made up of the soft factors. Research has proven that it is possible to measure these critical success factors while the project is still going through its lifecycle. Shenhar et al., (2001) identified four distinct dimensions that contribute to project success. The dimensions identified are "(1) project efficiency, (2) impact on the customer, (3) direct business and organisation success, and (4) preparing for the future"(Shenhar et al., 2001, p.699). In contrast to this Rezvani et al., (2016 p. 1113) citing Pinto (1990) has identified key project success factors as "(1) effective communication with internal and external stakeholders, (2) troubleshooting (i.e., unexpected complications and challenges are effectively managed as they occur in crisis moments), (3) clear project mission, and (4) top management support" (p.1113). Based on factor four (top management support) it can be inferred that high-quality LMX relationships between leaders and subordinates are key drivers of project success.

Over the years many different multi-dimensional models such as the Balanced Scorecard, Intellectual capital and Success Dimensions have been developed to measure success at the

corporate level, but ironically literature in the project management field has not adapted to include similar concepts (Shenhar et al., 2001). Yang, Huang, and Wu, (2011) was able to identify that along with other critical success factors that the leadership style of the leader or in this case the project manager is also of great importance in determining the outcomes of a project. Blaskovich citing Fiedler (1964) , Blasckovics (2014), and Turner (2009) notes that there is a strong focus from academic authors on the different leadership styles utilised by project managers and the bearing of these styles on the success of the projects. “It inevitably seems that project managers have a considerable impact on projects and a key role in achieving project success”(Blaskovics,2016, p. 278). It is evident that the attitudes of those who are involved in projects and their characteristics and management styles are essential factors in achieving project success (Blaskovics, 2016; Maqbool, Sudong, Manzoor, & Rashid, 2017; Rezvani et al., 2016).

Literature does, however, fail to indicate if any links exist between leader-member exchange, work engagement and project success specifically with regards to the construction industry. The relationship between these constructs has been tested in other industries previously, and their results have indicated that links do exist. Greater project outcomes have been positively linked to increased levels of supervision and higher levels of supervision. Research provides evidence that increased levels of job satisfaction lead to increased job performance. Trust is an outcome of good quality LMX relationships, and this leads to a decrease in the chances that an employee is likely to leave their job. Therefore management needs to be cognisant of job satisfaction, and the trust of their project managers as both of these can result in a higher chance of project success in complex project situations (Rezvani et al., 2016). Literature indicates that human elements and actions of management are key factors in the success of a project. Direct links have been found to exist between “human factors, management actions, and related success traits” (p.1137) in relation to project success (Zafar, Tabish, & Jha, 2012).

2.1.9 Work engagement and project success

At best literature makes inferences that a leader’s style of leadership can have an influence on the engagement of employees possible resulting in lower levels of performance but not necessarily impacting on project success (Turner & Müller, 2005; Yang et al., 2011). One of the precursors of work engagement is job satisfaction, and job satisfaction fulfils a mediating role which regulates the impact of the emotional intelligence on the project managers’ ability to evaluative judgements concerning their jobs and it also reflects in their assessments of project success (Rezvani et al., 2016; Maqbool et al., 2017). Haffer and Haffer (2016) make

the case that works engagement in one of the factors which are conducive to the success of projects. Taneja et al. (2015) indicate that positive relationships do also exist between the engagement of employees, the organisation's performance outcomes, the ability of an organisation to retain employees and the productivity and profitability of the organisation.

2.1.10 Turnover Intention

Turnover intention is defined as “a conscious and deliberate wilfulness to leave the organisation” (Tett & Meyer, 1993.p.262). Factors that contribute to the intention of staff to turnover has been identified as job satisfaction (Hertzberg 1968), poor quality LMX relationships (Matta et al., 2015), low motivational level both intrinsic and extrinsic (Morrow et al. 2005).

Early research into the turnover intention of employees focussed mostly on the ability of employees. Over time this point of view has developed as researchers became aware that the dynamic and behaviours within an organisation have an impact on the turnover intentions of employees. It became evident as research developed that managerial behaviours, attitudes and actions have a significant impact on the turnover intentions of employees (Covella et al., 2017).

Turn over intentions of employees are further reduced by increased levels of job satisfaction, and therefore management needs to be cognisant of job satisfaction, and the trust of their project managers as both of these can result in a higher chance of project success in complex project situations (Rezvani et al., 2016). Memon, Salleh, Harun, Rashid, and Bakar (2014) point to the fact that the congruence that exists between employee values and the culture of an organisation has a significant influence on employee turnover. The loss of staff has a negative impact on business due to the high cost involved with staff turnover. Staff turnover also impacts on the morale of remaining employees, it results in the loss of organisational memory, it leads to lower productivity, and it affects the chances for project success (Henson, 2015; Du Plooy & Roodt, 2010).

Bakker et al. (2003) show that specific job resources can contribute to the reduction of the intention of turnover. Du Plooy and Roodt (2010) reports that “support by colleagues,

supervisory coaching, performance feedback and timer control"(p.2) can lead to a reduction in the turnover intentions of employees.

Literature provides evidence that the relationship between managers and employees leads to higher levels of an employee's sense of organisational citizenship and this affects the turnover intention of staff (Kumar & Singh, 2012). Ultimately research indicates that a person with high levels of engagement is less likely to leave an organisation, therefore, lower the intention to turnover of staff. An organisation that can form the ability to attract, develop and retain talented staff has a greater chance of survival and a greater chance to prosper. The negative consequences as to why employees are leaving their work are becoming more and more important. The results and the associated expenses for organisations are a major concern and a key challenge. (Du Plooy & Roodt, 2010)

Sang et al. who researched the work-family conflict, job satisfaction and turnover intention reported that females who are active in the South African construction industry show higher levels of turnover intention in comparison with their male counterparts when stress levels are higher, and engagement level is lower. Job security and career development are also seen as an important outcome for professionals working in the construction industry resulting in individuals opting secure permanent employment as soon as the opportunity comes along.

2.1.11 Turnover Intentions and Leader-Member Exchange

The role of leader-member exchange in high turnover work environments indicates that the involvement of a supervisor in the day to day activities of an employee does have a meaningful role in the voluntary turnover decisions of employees. Research carried out by Henson (2015) has proven that supervision does fulfil a meaningful role in the turnover intentions of employees and that it is possible to infer that good quality LMX relationship will result in the turnover intentions of employees reducing. This inference is supported by research conducted by Matta et al. 2015 who confirmed that poor quality LMX relationships and the behaviour and attitudes of managers (Covella et al., 2017) are contributors to the increase in staff intentions to turnover. Henson (2015) showed that the quality of Leader-member exchange within an organisation is critical to the success of an organisation. If a relationship between a leader and

subordinate is poor, this can result in employees losing commitment, disengaging from their work and lower levels of job satisfaction.

Literature is however inconclusive in the sense that it is not clear if LMX does affect the turnover intention of staff especially in the construction industry, but based on the existing literature it can, however, be inferred that LMX quality does have an impact on the turnover intention of project managers in the construction industry. Research provides evidence that the relationship between managers and employees leads to higher levels of an employee's sense of belonging to the organisation and this affects the turnover intention of staff (Kumar & Singh, 2012). Literature also provides evidence that the quality of LMX relationship does affect the job performance of staff further supporting the inference that it does have a positive impact on the engagement of staff (Henson, 2015).

2.1.12 Turnover Intentions and Work Engagement

Work engagement is a popular topic within current literature and within many organisations, given its association with the well-being and performance of employees (Christian, Garza & Slaughter, 2011; Knight, Patterson, & Dawson, 2017). Knight et al., (2017) notes that for this exact reason many organisations have taken the initiative to investigate the antecedents and consequences of the engagement levels of their employees. Taneja et al.,(2015) formed the view that organisations can improve their competitive advantage by having an effective and efficient employee engagement strategy and through this limit the turnover of employees increasing the likelihood of existing in the future. Low levels of work engagement contribute to the decreased work performance of employees as well as the decrease in employee wellbeing and the increase in employee intention to turnover (Knight et al., 2017). Du Plooy and Roodt citing Bakker et al. (2003) indicate that specific job resources can contribute to the reduction of the intention of turnover such as “support by colleagues, supervisory coaching, performance feedback and timer control” (Du Plooy & Roodt, 2010,p.2). These resources can have a significant inverse relationship on the turnover intentions of employees and organisational involvement which can mediate this causal relationship (Du Plooy & Roodt, 2010).

The motivation potential of a job and the personal resource of a person can result in positive individual, organisational and project outcomes. Example of these outcomes is wellbeing and performance. On the other hand, a shortage of key "resources and high work demands are the leading causes of poor health outcomes, such as burnout, stress, and depression as well as turnover, sickness absence and poor performance "(Knight et al., 2017). Organisations who can foster high levels of engagement can improve the levels of retention of talented employees, and they are able to increase stakeholder value (Taneja et al., 2015).

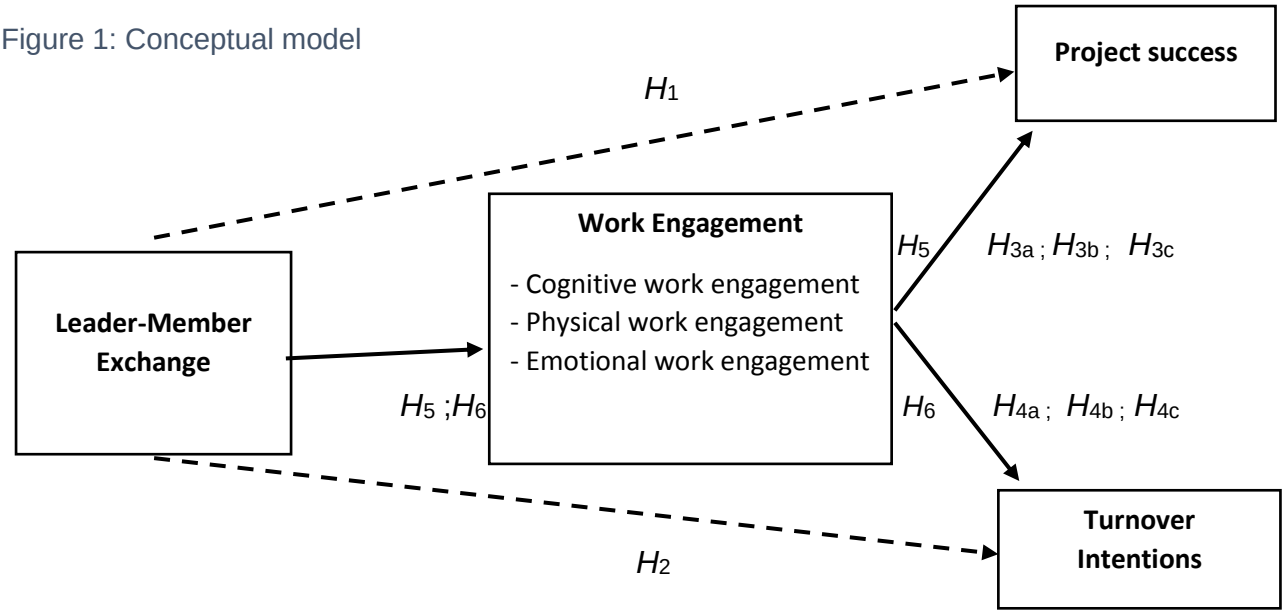
Literature indicates that the chances for an employee to quite their work increase the more disengaged an employee becomes from his work. The more engaged employees are in their work, the higher the chances become for achieving a successful project and business outcomes. Increased levels of job satisfaction leads to a decrease in the chances that an employee is likely to leave their job, and therefore management needs to be cognisant of job satisfaction, and the trust of their project managers as both of these can result in a higher chance of project success in complicated project situations and a reduction in staff turnover (Rezvani et al., 2016).

Saks (2006) explored the correlations between employee engagement and turnover intention and found that a strong negative correlation exists between employee engagement and turnover intentions and in a similar study Halbesleben (2010) conducted a meta-analysis which found evidence that proves that a strong negative relationship exists between the engagement of an employee and the employee's intention to turnover and for this reason, it is possible to infer that a negative correlation exists between work engagement and the intention to turnover.

Du Plooy & Roodt, (2010) did an investigative study in 2010 which focussed on the predictive relationship that exists between the work engagement - burnout continuum and turnover intentions. The outcomes of the research were conclusive. The result indicated that work engagement, organisational citizenship behaviour, work alienation and burnout could be predictors of an employee's turnover intentions (Du Plooy & Roodt, 2010). Intermediate linkages have also been identified between job performance and employee turnover, and Mobley (1977) indicates that the relationship between job satisfaction and employee turnover is significant but not particularly strong.

2.1.13 Conceptual Model

Figure 1: Conceptual model



3 CHAPTER 3: RESEARCH HYPOTHESIS

It is argued that work engagement has a mediating effect on linkages between LMX and the outcomes of a project and on the turnover intentions of the project managers that are involved in these projects. The study aimed to develop and empirically test a model (Figure 1) on the impact of LMX on project success and the turnover intention among construction project managers and to confirm if work engagement acts as a mediator between the different constructs.

An interesting discovery in the existing literature is that most challenges experienced on projects are the result of managerial issues and not because of technical problems (Chan, Scott, & Chan, 2004; Turner & Müller, 2005). This support this case for exploring the relationships between LMX, work engagement and project success further. Literature suggests that the skills of leaders and project managers skills might be the most important factors determining the outcome of a project and for this reason, it is key to form a clear understanding of the impact the relationship between a leader and a subordinate can have on the outcomes of a project. Trust has been identified as one of the outcomes of LMX and trust has also been recognized as one of the antecedents of work engagement (Matta et al., 2015). Because of these findings, it can be argued that high levels LMX relationship and work engagement can result in increased chances of project success. Previous studies have indicated that positive relationships exist between project success, the job satisfaction of employees and the trust that exists between the team members of the project team (Chan et al., 2004; Turner & Müller, 2005; Yang et al., 2011).

Using the theoretical framework illustrated in figure 1. the researcher argues for a relationship between the constructs that is mediated by the work engagement path. It is expected that project managers with higher levels of engagement will reflect higher levels of positive work attitudes which leads to an increased probability of project success and a reduction in the risk of turnover. Management and project managers require a clear understanding of what constitutes project success and what the factors are that can be controlled to ensure this outcome. The identification of these factors should be of significant interest to those who aim to further organisational goals.

The research study had three distinct objectives.

1. The study aimed to gain an understanding of the relationships that exist between the independent variable leader-member exchange, and the depended variables project success and turnover intention.
2. To gain an understanding of the relationships between the three work engagement subscales (cognitive work engagement, emotional work engagement and physical work engagement) and the dependent variables project success and turnover intention.
3. To gain an understanding of the relationships where leader-member exchange and work engagement are the predictors to project success and turnover intentions.

It is hypothesised that LMX impacts on projects success and the turnover intentions of construction project managers. It is further hypothesised that the work engagement of construction project managers in the construction industry mediates the relationship between LMX, project success and on turnover intentions of construction project managers.

3.1 HYPOTHESIS ONE:

- **Null hypothesis one ($H1_0$):** No significant relationship exists between leader-member exchange and project success.
- **Alternate Null hypothesis one ($H1_1$):** - A significant relationship exists between leader-member exchange and project success.

Dependent variable: project success; Independent variable: LMX

3.2 HYPOTHESIS TWO:

- **Null hypothesis two ($H2_0$):** - No significant relationship exists between leader-member exchange and turnover intention.

- **Alternate Null hypothesis one ($H2_1$):** - A significant relationship exists between leader-member exchange and turnover intention.

Dependent variable: Turnover Intention; Independent variable: LMX

3.3 HYPOTHESIS THREE (a):

- **Null hypothesis one ($H3a_0$):** - No significant relationship exists between cognitive work engagement and project success.
- **Alternate Null hypothesis one ($H3a_1$):** - A significant relationship exists between cognitive work engagement and project success.

Dependent variable: project success, Independent variable: cognitive work engagement

3.4 HYPOTHESIS THREE (b):

- **Null hypothesis one ($H3b_0$):** - No significant relationship exists between emotional work engagement and project success.
- **Alternate Null hypothesis one ($H3b_1$):** - A significant relationship exists between emotional work engagement and project success.

Dependent variable: project success; Independent variable: emotional work engagement

3.5 HYPOTHESIS THREE (c):

- **Null hypothesis one ($H3c_0$):** - No significant relationship exists between physical work engagement and project success.
- **Alternate Null hypothesis one ($H3c_1$):** - A significant relationship exists between physical work engagement and project success.

Dependent variable: project success; Independent variable: physical work engagement

3.6 HYPOTHESIS FOUR (a):

- **Null hypothesis four ($H4a_0$):** - No significant relationship exists between cognitive work engagement and turnover intention.

- **Alternate Null hypothesis four ($H4a_1$):** - A significant relationship exists between cognitive work engagement and turnover intention.

Dependent variable: turnover intention ; Independent variable: cognitive work engagement

3.7 HYPOTHESIS FOUR (b):

- **Null hypothesis four ($H4b_0$):** - No significant relationship exists between emotional work engagement and turnover intention.

- **Alternate Null hypothesis four ($H4b_1$):** - A significant relationship exists between emotional work engagement and turnover intention.

Dependent variable: turnover intention ; Independent variable: emotional work engagement

3.8 HYPOTHESIS FOUR (c):

- **Null hypothesis four ($H4c_0$):** - No significant relationship exists between work engagement and turnover intention.

- **Alternate Null hypothesis four ($H4c_1$):** - A significant relationship exists between work engagement and turnover intention.

Dependent variable: turnover intention ; Independent variable: emotional work engagement

3.9 HYPOTHESIS FIVE:

- **Null hypothesis five ($H5_0$):** - No significant relationship exists between leader-member exchange, work engagement and project success.

- **Alternate Null hypothesis five ($H5_1$):** - A significant relationship exists between leader-member exchange, work engagement and project success.

Dependent variable: Project success; Predictors: Leader-member exchange, work engagement.

3.10 HYPOTHESIS SIX:

- **Null hypothesis six ($H6_0$):** - No significant relationship exists between leader-member exchange, work engagement and project success.

- **Alternate Null hypothesis six ($H6_1$):** - A significant relationship exists between leader-member exchange, work engagement, and turnover intentions.

Dependent variable: Turnover intention; Predictors: Leader-member exchange, work engagement.

4 CHAPTER 4: RESEARCH METHODOLOGY

Chapter four discusses the methodology that was followed in the collection of data, the cleaning of the data and the analyses of the data to test the hypothesis as set out in Chapter three. The chapter provides an overview of the research design, the population, the sample, the survey instrument and the limitations of the research.

4.1 RESEARCH DESIGN

The research design and methodology are affected by the nature of the hypotheses in Chapter three, and therefore the choice of the correct methodology and the design is key to the research study (Saunders & Lewis,2012; Zikmund, Babin, Carr,&Griffin,2010).

The study is empirical in nature, and a deductive approach was followed. A research strategy was designed to test the theoretical hypotheses. The study aimed to analyse the relationships and interactions between predictor variables and the dependent variables.

Quantitative research is seen as providing hard and factual data (Barnham, 2015). Centuries of developments in statistics has led to the researchers agreeing on "the use of quantitative analysis tools and the criteria which should be used to ensure that the data is both valid and reliable" (Barnham, 2015,p.838).

Quantitative research is in most instances connected to three activities namely sampling, measuring and procedures for causal inference (Zyphur & Pierides, 2017). The purpose of the research design was to be a descriptor-explanatory study. The study used descriptions as a precursor to explanations. Descriptive studies aim to accurately describe events or situations (Saunders, Lewis, & Thornhill, 2008). By using a quantitative approach the research study is replicable and representative of a population (Zyphur & Pierides, 2017). The research approach is also suitable as the researcher could derive concepts from the literature that succinctly capture the problem scenario (Onen, 2016).

It was imperative that the researcher had a good understanding of the phenomena he aimed to study before collecting any data (Saunders et al., 2003). Zyphur and Pierides (2017) echo this point of view by proposing that "researchers should always attempt to understand their activities and the discourse they produce - including their observations – as ways of being oriented rather than as purposes"(p.13). Explanatory studies look to identify causal relationships between variables (Saunders et al., 2008).

Saunders and Lewis, (2008) point to the fact that the researcher will be guided in terms of the research design the better the researcher's understanding of the relevant theory. The extent to which the researcher was clear about the method of the research lead the researcher to decide if the researcher needed to follow a deductive approach. "The design of the study was the glue that held all the elements in a particular project together and gave it direction"(Onen, 2016,p.36). When making use of the deductive approach the researcher developed a theory, hypothesis and a strategy to test the hypotheses. If the researcher used an inductive approach, the researcher would have had to collect data and generate a theory as a result of the data analysis (Saunders et al., 2008).

The deductive approach followed had strong connections and resemblances of a scientific approach (Saunders et al., 2008). A deductive approach was a suitable approach for several reasons as it enabled the researcher to test the relationship between two or more concepts or variables. It also allowed the researcher to hypothesise; it enabled the researcher to express the hypothesis in operational terms so that it was quantitatively measurable and the outcome of the test either confirmed the theory or indicated that there was the need for its modification(Saunders et al., 2008).

The deduction method also allowed the researcher to generalise about statistical regularities in human social behaviour which was necessary to select samples of sufficient numerical size (Saunders et al., 2008). A mono-method was followed as this provided enough insight into the field of study.

The methodology of choice was the Realism approach. The realism approach indicates that it is important not only to study what is immediately apparent but also was lied behind what was immediately apparent. There is a need to form a greater understanding of the deeper

structures and the relationship within the data (Saunders & Lewis, 2012). The chosen methodology contained a lot of assumption on how the researcher views the world. These assumptions underpinned the method the researcher chose for the research strategy. The assumptions underpinned the collection of data and the understanding and interpretation of that data (Saunders & Lewis, 2012).

Bhaskar (1989) who identifies with the epistemology of critical realist state that these realists argue that as we are only able to truly understand the world if we understand the social structures in the world and have an understanding as to what gave rise to these phenomena. "What is visible to us is only a part of the bigger picture"(Saunders et al., 2008,p.115). "Bhaskar (1989) further argues that we are able to identify what we do not see through the practical and theoretical processes of social science" (Saunders et al.,2008,p.115).

A survey strategy of a structured approach was followed to collect data from a sizeable population. The data collection was taken in the form of questionnaires. Common strategies used in business and management strategies are to ask questions like who, what, where, how much and how many. The method was an economical way of collecting data and allowed for data to be standardised and easily compared.

The quantitative data were analysed by using descriptive and inferential statistics. From the statistics, possible reasons for relationships and the relationship between variables was examined. Following a survey strategy also empowered the researcher to have more control of the research process. Using data that was collected through a survey also allowed the researcher to produce representative findings from the whole population in an affordable way. (Saunders et al., 2008).

The study was quantitative in nature. A cross-sectional correlational research strategy was used to collect the data as this ensured that the data was collected at a specific point in time (Saunders et al., 2008). The goal was to collect data in such a way that the relationship between two or more variables can be measured in its natural setting without manipulation or control. The researcher could then test correlational statistics between two or more of the variables. By doing this, the researchers were able to establish if any relationship existed between the different variables (Hofstee, 2011).

The researcher wanted his research to reflect a "snapshot" in time as the time duration allowed for research was constrained. Saunders & Lewis (2012) citing Robson (2002) indicates that cross-sectional studies are employed with a survey strategy.

The research questions that were used in the data collection process involved multiple independent and dependent variables, and for this reason, a multivariate statistical analysis was carried out (Zikmund et al.,2010). A Structural Equation Modelling (SEM) was utilised as the analysis technique was dependent in nature and the method allowed the researcher to predict or explain one or more dependent variable (Zikmund et al.,2010). An SEM offered superior mediation capability as it accommodated for measurement errors whereas this was not the case with multiple regression methods (Cheung& Lau,2008). A linear regression analysis was also done. Linearity is the assumption that the relationship that exists between the two variables is linear in nature. The researcher wanted to understand what type of relationships exists between the different variables.

4.2 POPULATION

Saunders & Lewis (2012, p.132) defines a population as a “complete set of group members ” who have the same characteristics. The population for the study included project managers who operate within the construction industry. Project managers who are registered with the South African Council for the Project and Construction Management Professions (SACPCMP) as professional or candidates were targeted as well as project managers who work on construction-related projects but who are not registered with the SACPCMP. In many cases, it has been found that project management was not the initial career choice of many project managers when they first entered the market but that is a career which they rolled into later (Savelsbergh, Havermans, & Storm, 2016).

“A Construction Project Manager is defined as a person who is in the management of the physical construction process within the built environment from conception to completion, including management of related professional services. The construction project manager is the one point of responsibility in this process” (www.sacpcmp.co.za).

4.3 UNIT OF ANALYSIS

The data was gathered from individuals who are professional and candidate construction project managers. The aggregate of all the respondents was used to conduct the analysis. The unit of analysis was a construction project manager with the relevant qualification and experience.

4.4 SAMPLING METHOD AND SIZE

The data that was collected through the survey was primary data, and the respondents that took part in the study were informed that the information that was being collected would be kept confidential and used by the Gordon Institute of Business, its faculty and students for research purposes.

Sampling is defined as " any procedure that draws conclusions based on measurements of a portion of the population" (Zikmund et al., 2010 p.68). It was key that the size of the sample of the population was enough that the researcher could draw accurate conclusions from the data. Jacob Cohen in his paper titled "Quantitative methods in Psychology" identified four key variables that need to be used when one estimates the size of a sample in statistical analysis. The four key variables that need to be taken into consideration are the following: the significance criteria (α), power, the number of independent variables and the effect size (Cohen, 1992).

The sample size was checked by using the Kaiser Meyer – Olkin (KMO) model. The model measured the adequacy of a sampling size. In other words, it examined if the data contains enough variables that will produce a meaningful result if the data is analysed statistically (Field, 2007,p.640).

4.5 MEASUREMENT INSTRUMENT

The researcher adopted measurement scales used previously in other research which have been validated to measure the identified constructs. The researcher ensured that the scale

which has been identified for the study has been used extensively previously and that the scale has been proving to be valid and reliable ways of measuring constructs.

The researcher used a six-point Likert scale ranging from one (Strongly disagree) to six (Strongly Agrees). The Likert scale can be used to measure interval data (Weijters, Geuens, & Baumgartner, 2013). By aggregating the score of each question in the survey, the researcher derived a total score for each specific measure.

Results have indicated that scales with familiar response categories such as ‘‘Strongly (dis)agree” or “ completely (dis)agree” led to higher endorsement frequencies of their associated response categories (Weijters et al., 2013). To test the reliability of the data, a Cronbach Alpha Test was carried out. The test determined if the data is reliable and fit for its intended purpose (Salkind, 2000).

4.6 DATA GATHERING PROCESS

4.6.1 Research Method and Questionnaire Design

A Questionnaire survey was utilised to collect the data as it was deemed to be a suitable method for collecting data in the initial stage of the research (Bowen et al., 2013). The research questionnaire allowed for coverage of the relevant construction project management professionals active in the South African construction industry. A questionnaire approach is a simplified approach which has been utilised by many researchers previously (Bowen et al., 2013).

The questionnaire survey was based on an internet platform which provides respondents with online access to the survey. This method is an inexpensive way to cover the construction management professional in the construction industry (Field, 2009). A pilot (web-based) study was conducted to confirm the suitability of the survey questionnaire. The full survey questionnaire was launched in early June 2018, and it remained open to respondents online until 08 August 2018. A self-administered survey was emailed by the registered professional statutory body, and the email provided respondents with a URL link to the questionnaire. An advantage of using a web-based distribution is that it encourages the potential respondents to express their views in an honest, safe and straightforward way (Bowen et al., 2013). It was key for the researcher to choose the appropriate techniques and tools to collect the data as

this assisted him to achieve the study objectives. A self - administered survey according to Zikmund et al. (2010) is a survey where respondents take the responsibility to read and answer questions. These types of the survey have several advantages such as being able to send it to a large sample and anonymity increases as surveys that are associated with these type questionnaires are answered honestly by respondents. The advantages of having respondents completing questionnaires are that it offered the respondent confidentiality and are generally easier to analyse and easier to turn into quantitative results. Questionnaires can be sent to a more significant sample which will result in higher confidence levels. The results of such a survey become easier to compare the more structured the questionnaire is (Hofstee, 2011). Therefore, survey questionnaires are often used for descriptive or explanatory research. Using the explanatory research approach allowed the researcher to examine and explain the cause and effect relationship between the variables(Mahesar,2015). For the study to be measurable, it was vitally important that the questionnaire focussed on the indicators of the concepts that were being studied (Onen, 2016).

Probability sampling was used as it provided the best chance that every member of the proposed population had a known, non-zero probability of being selected (Field,2009). Convenience sampling and simple random sampling was also selected as these methods require minimal knowledge of the population and the data is easy to analyse. Along with the probability and convenience sampling, Snowball sampling was the selected non-probability sampling method to collect data from individuals who are not registered with the SACPCMP. “Snowball sampling is used when it is difficult to identify members of your population” (Saunders et al., 2012,p.147). Snowball sampling is a non-profanity type sampling. In snowball sampling, the first sample member is identified and contacted, and these sample members are then relied on to distribute the survey. In snowball sampling, subsequent members are the identified by earlier sample members the reason for utilising a snowball sample method is that it was easy to contact and collect data from the initial project managers and to gain support for access to other project managers. By gaining the support of the initial project manager, it becomes easier to gain access to other project managers and the sample increases. Individuals who are “selected for a snowball sample is likely to identify others who are similar to themselves resulting in a homogenous sample” (Saunders & Lewis,2008,p.240).

The survey was set up on the online platform Typeform. The SACPCMP and companies that operate in the construction project management industry were approached for permission to distribute the surveys to their members or employees. Participation in the survey was

voluntary, and participants had the choice to opt out at any point when they wished to do so. The survey did not require any identifying information.

4.6.2 Control variables

The questionnaire included several basic biographical questions such as the gender, the respondent's age and the respondent's tenure at their organisation. The survey also included one control variable which asked the respondent to confirm if they were active as a project manager in the construction industry. Only "yes" responses were utilised in the analyses of the data.

4.6.3 Independent, Dependent & Mediator Variables (Constructs)

The remainder of the questionnaire focussed on the constructs which included leader-member exchange, work engagement, project success and turnover intention. As stipulated previously the researcher utilised a six-point Likert scale ranging from one (Strongly disagree) to six (Strongly Agrees). The ordinal answers from the questionnaire were coded numerically from one to six. For the study, the variables in the study are referred to as constructs as they are abstract concepts which according to Creswell (2012) are not easy to measure as they are not stated in a specific or an applied way. The researcher utilised construct measurement scales to quantify and measure these theoretical constructs (Bagozzi &Yi, 2012). The scales for the measuring of the different construct are identified below.

4.6.3.1 Leader-Member Exchange

Leader-Member Exchange was measured using a nine-item scales by Henson (2015) The internal consistency validity of the scale has been reported as between 0.966. A sample question from the scale is "I do not mind working my hardest for my supervisor".

4.6.3.2 Work Engagement

Work Engagement was measured using a 16 - item job engagement scale (Rich et al., 2010) The internal consistency validity between the three dimensions of the scale has been reported as between 0.89-0.94. A sample question from the scale is, “I work with intensity on my job”.

4.6.3.3 Project Success

Project Success was measured using an eight-item Project Success scale (Maqbool et al., 2017). The internal consistency validity of the scale has been reported as between 0.71. A sample question from the scale is, “I completed my projects on time as scheduled”.

4.6.3.4 Intention to Turnover

Intention to Turnover was measured using a three-item Intention to Turnover Scale (Neira-fontela & Castro-casal, 2014). The internal consistency validity of the scale has been reported as between 0.638 A sample question from the scale is, “I will probably look at a different company in the next year”.

4.7 ANALYSIS APPROACH

In the section below the process that was followed to analyse the data is discussed. The analyses of the data were done according to the process depicted below. The main steps in the data analysis included the preliminary analysis, the structural equation modelling (SEM) and the mediation analysis. The initial analysis included the data preparation, descriptive statistics, exploratory factor analysis (EFA) and confirmatory factor analysis (CFA).

As part of the multivariate data analysis, four main statistical assumptions were made. The assumptions that were made was that the data is normally distributed, it adheres to homoscedasticity, linearity and multicollinearity. Question TI3 in the turnover intention scale had to be re-coded as this question was reverse coded.

4.7.1 The Analysis Process

The data collected was analysed by making use of the commercial statistical package, SPSS statistics version 24 and AMOS 25. All the data was coded to correspond with the relevant terminology used in the questionnaire. Table 1 below reflect the steps data were followed in the data analysis.

Table 1: Steps for data analysis

	Steps	Process	Purpose	Method
STEP 1	Preliminary Analysis: Data preparation, descriptive and factor analysis			
	Data preparation	Data editing	▪ Cleaning of data, checking for outliers, missing data, unengaged responses	▪ Mahalanobis distance
		Testing for Normality	▪ Is the data normally distributed	▪ Kurtosis ▪ Skewness
	Descriptive Statistics	Descriptive statistics	Descriptive statistics	▪ Percentage ▪ Frequency Distributions
	EFA – exploratory analysis	PCA - Principal component analysis	▪ Confirm if the data can be used for factor analysis	▪ KMO Test ▪ Bartlett's test of Sphericity
			▪ Confirm the total of the factors that need to be analysed	▪ Eigenvalues
			▪ Confirm the factors of the constructs - LMX,WE,PS &TI	▪ PCA ▪ Varimax rotation
	Structural Equation Modelling			
STEP 2	Measurement Model	Factor Analysis	▪ Identifying the loadings of variables onto constructs	▪ CFA - Identifying the correlations estimates and factor loadings

STEP 2		Validity	▪ Confirm validity	▪ Convergent Validity and discriminant validity
		Reliability	▪ Confirm reliability	▪ Cronbach Alpha and composite reliability coefficient
		Model Fit Analysis	▪ Confirm model fit	▪ Absolute model fit indices
	Structural model	Model fit analysis	▪ Confirm model fit	▪ Absolute model fit indices
		Hypothesis Testing	▪ Model confirmation for support of hypothesis	▪ Regression Weights
	Mediation Analysis	Mediation Analysis	▪ Identifying if WE are a mediator	

(Adapted from Ender,2010; Field, 2009; Hill & Lewicki, 2006; Hair et al., 2010)

Table 2 below reflect the notations that were used throughout the study.

Table 2: Acronyms for constructs

Acronym	Construct
LMX	Leader-Member Exchange
WE	Work Engagement
PS	Project Success
TI	Turnover Intention
WEP	Work Engagement Physical
WEC	Work Engagement Cognitive
WEE	Work Engagement Emotional

Step 1: The step included the cleaning of the data and the removal of incomplete responses. The researcher also constructed demographic profiles of the respondents that took part in the survey, and this was done by using key variables such as the gender of the respondents, the age of the respondents and the respondent's tenure at their organisation. The analysis was carried to describe the sample and to determine if there were any deviations present from the expected distribution. The results are presented in Chapter Five.

Step 2: The next step was to calculate the descriptive statistics from the data that was collected. Descriptive statistics were calculated for each of the items that were included in the measurement scale. These descriptive statistics included the means, the median, the standard deviation, the skewness and the kurtosis. The results of the descriptive statistics are presented in section 5.1.3.

Step 3: For each of the scale items frequency distributions was constructed and tested for normality.

Step 4: The internal consistency of the scales was tested by doing a Cronbach's Alpha, and the results of the consistency test are presented in section 5.1.5.5 Table 16.

Step 5: The final step was to analyse the fit of the measurement and the structural models of the data. The structural models were specified by using Amos 25. The specifying of the structural models were modelled according to the hypotheses set out in chapter three. The results of the measurement model fit and the structural model fit are discussed in chapter five.

4.7.2 Data preparation - screening and editing of the data.

The first step in the statistical analysis procedure was the screening for missing data, unengaged responses and outliers. As an electronic survey was utilised for the data gathering, missing values and outliers were expected, but with an electronic survey tool typographical and out -of -range values were not expected to be present in the data.

The data was reviewed to determine if there were responses with a lot of missing data. Responses with a lot of missing data were deemed unuseful, and these respondents were deleted from the data set. Due to the sample size, the researcher opted to remove all responses that had more than ten per cent (10%) missing data. Where responses had less

than ten per cent (10%) missing data, the missing values were replaced by the median value of all the responses. It is common to replace the missing values in studies of this nature with the mean or median (Ender,2010) as this ensures that the size of the data set does not decrease, and response bias is avoided. It was key to make these decisions with regards to these values as these values would ultimately impact on the outcomes of the study. The data was also reviewed for unengaged responses. These are typically responses where the respondents gave the same values for all the questions and where responses like these were found they were removed from the data set (Ender,2010). These responses were identified by determining the standard deviation of the answer. Respondents with very low standard deviation were removed as these answers were deemed un-useful. If there was a low level of standard deviation, it indicated that there was minimal variation between the answers. It is not ideal to remove data as the researcher always want as much data as possible, but in this case, the responses did not add value and were therefore removed.

4.7.3 Outliers

The researcher made use of a Mahalanobis Distance to identify outliers. Outliers can influence the results as they pull the mean away from the median (Ender,2010). The Mahalanobis Distance is a measure that indicates to the researcher if a data point is an outlier concerning the independent variables values. The Mahalanobis Distance measures the distance between the mean (centroid) and the observation and if the distance is too large in comparison with the other observations the observation is deemed to be an outlier (Field, 2009; Hill & Lewicki, 2006).

It was important to identify the outliers, and they impact on the distributional assumptions, and they can also result in reflecting false or mistaken responses. There are different types of outliers namely (1) univariate which are extreme values for a single variable and (2) multivariate which are extreme values for a correlation (Ender,2010).

4.7.4 Testing for Normality: Skewness and Kurtosis

The data were tested for normality. Normality refers to the distributional assumptions of a variable (Little & Rubin,2014) For this research study; the author assumed a normal distribution for the data set. The test for normality included a Skewness and Kurtosis test. Frequency distribution of the data was created. The frequency distribution indicates how many times each of the scores occurred within the dataset and it allowed the researcher to assess

the properties of the distribution scores (Field, 2009). In a normally distributed data set, the data would be symmetrically distributed around the centre of all the scores.

The two main ways in which the shape of the distribution can vary from a normal distribution is the (1) the lack of symmetry (called skew) and (2) pointiness (kurtosis). Skewness refers to a distribution where the data is not distributed symmetrically. In a skewed distribution, the most frequent scores can be found grouped at the end of the scale. Kurtosis is a measurement that identifies the degree to which scores cluster at the ends of a distribution. Kurtosis also indicates how pointy the distribution is (Hair, Thomas, Hult, Ringle & Sartedt, 2016). Existing literature suggests that ideally a Kurtosis value should be located between -1 to +1 (Hair et al., 2016).

4.7.5 Descriptive Statistics

The biographical information of respondents and the control variables was utilised as basic descriptive statistics. The descriptive statistics enables the researcher to describe and summarise the data in a simple way (Creswell, 2012; Zikmund et al., 2010). By arranging the data in this format, the researcher also gains valuable insight into the statistics as the format provides information on the central tendency, variability and the relative standing (Creswell,2012).

4.7.6 Homoscedasticity

The data was analysed for Homoscedasticity. The dependent variables were checked to see if they exhibit consistent variance across the different levels of independent variables, this was done by creating a scatter plot with the independent variables on the x-axis and the dependent variable on the y-axis (Hair et al., 2014).

4.7.7 Linearity

In statistical analysis, linearity refers to the assumptions that there exist a linear relationship between predictors and dependent variables. Linearity tests determine if there is a consistent slope of change between an independent variable and a dependent variable (Field, 2009). It is was key to review if the relationship between the independent variable and the dependent

variable as consistent as the relationship between the variables could have resulted in the SEM analyses being flawed because of nonlinear data.

4.7.8 Multicollinearity

Multicollinearity analysis determines how much of a construct can be explained by another construct in a research study. If high levels of multicollinearity are present, it is hard to interpret the results as it becomes hard to determine the effect of a single construct in the study. High levels of multicollinearity result in complicated interpretations of relationships as it becomes difficult to ascertain on any single construct owing to their interrelationship. Multicollinearity is not desirable in regressions models however it is desirable for factor analysis. It simple terms multicollinearity means that the independent variables in the data set have high levels of correlations with each other and that they share too much variance. When multicollinearity is present, it influences the accuracy of estimates for dependent variables, and it inflates the error term for the dependent variables (Abdelmalek & Malek, 2008; Durrheim & Tredoux, 2004).

4.7.9 Exploratory Factor analysis

A factor analysis model endeavour to create a structure among variables and to analyse the model in its entirety. The EFA was conducted to identify any correlations that may exist between the variables in the data set and to determine what these correlations were. The EFA allowed the researcher to explore what the model might look like as it is a method to identify structure. The EFA enabled the researcher to determine the structural relations among the set of observed variables (Fabrigar & Wegener, 2011; Howard, 2016).

Ultimately, the aim of conducting the EFA was to transform the correlations that were identified between the observed variables into several smaller factors (Taha, Tej, & Sirkova, 2015). These smaller factors included all the essential data about the linear interrelationships among the original test scores. The EFA also allowed the researcher to identify any problematic variables and it provided the researcher with insight into the latent factors and how these can better be constructed to represent the measures. The EFA is a standard technique used to evaluate measurement models and forms part of a class of procedures that include the principal components analysis and the principal factor analysis (Byrne,2016; Kline, 2011).

The following three steps were followed to determine if an EFA is a viable option and to perform the EFA.

Table 3: Exploratory factor analysis steps

Step 1 :

	EFA Steps	Test /Method	Thresholds/Ranges
STEP 1 :	Data suitability : To investigate if the data can be used for factor extraction	▪ Kaiser -Meyer-Olkin (KMO) ▪ A measure of sampling adequacy	▪ The result needs to be higher than 0.6 (Hakimi & Triki, 2014; Worthington & Whittaker, 2006)
		▪ Bartlett's Test of Sphericity ▪ Parameter needs to be satisfied before proceeding with factor analysis. The test results must be significant.	▪ Significant (p<0.5) (Hakimi & Triki, 2014; Worthington & Whittaker, 2006)

Step 2 :

	EFA Steps	**Test /Method**		**Thresholds/Ranges**
STEP 2:	**Factor extraction:** To determine the smallest number of factors that best represent the interrelationship of the variables. The researcher must adopt an exploratory approach until a satisfactory solution is found.	**Principle Component Analysis(PCA)**	▪ **Kaiser Criterion :** Measure the total variance explained.	▪ **Eigenvalue > 1.** Factors with a value higher than one will be retained.
			▪ **Total Variance Explained** Measure the total variance explained	▪ **60%>.** Components that contribute to more than 60 % of the total variance explained are deemed to be satisfactory

Step 3:

	EFA Steps	Method		Thresholds/Ranges
STEP 3:	**Factor rotation & interpretation:** Components that are the biggest contributors to the variance explained is extracted.	**Principle Component Analysis (PCA)**	▪ **Varimax Orthogonal Rotation:** Reduces the number of variables that have high cross-loadings	Items are associated with components which it has the highest loading with.

(Adapted from Ender,2010; Field, 2009; Hill & Lewicki, 2006 ; Hair et al., 2010)

4.7.10 Kaiser- Meyer- Olkin (KMO) and Bartlett's Test of Sphericity

A Kaiser -Meyer -Olkin (KMO) test and Bartlett's Test of Sphericity was carried out to determine if an EFA a viable option to analyse the model. Values greater than 0.60 (>0.60) is suggested for the KMO and Bartlett's test should be significant at a 95% confidence interval (p>0.05) (Hakimi & Triki, 2014; Worthington & Whittaker, 2006)

4.7.11 Commonalities

Commonalities are the extent to which items correlate with all the other items. The researchers opted to remove items with commonalities < 0.2 as this value indicates a high level of common variance. Values higher than 0.5 is deemed as acceptable (Field 2009; Maqbool et al., 2017).

4.7.12 Structural Equation Modelling

The next step in the data analysis process was to carry out a Structural Equation Model (SEM). An SEM is defined as a "multivariate technique that considers and estimates the linear and causal relationships between multiple exogenous (independent), and endogenous (dependent) constructs through simultaneous, multiple equation processes" (Babin & Svensson, 2012, p.321). Structural Equation Modelling is a popular technique as it provides researchers with the ability to move to new theories and to form new levels of understanding (Babin & Svensson, 2012).

A structural equation model is a combination of common multivariate techniques. The purpose of the SEM is to explain covariance and to assist the researcher to translate the data into the fit of a model. The objective of using a multivariate technique such as the SEM is to provide

the researcher with greater explanatory ability and statistical efficiency (Byrne, 2016). Statistical test such as multiple regression and multivariate analysis are limited as they only allow the analysis of a singular relationship at a time whereas with an SEM it is possible to analyse multiple relationships (Loi, Lam, Ngo, & Cheong, 2015). The SEM allows the researcher to investigate the entire theory while still considering all the available information.

The SEM relates constructs through correlational and dependence relationships. The model is useful because it allowed the researcher to have multiple constructs which were each represented by several measure variables. The SEM allows for the construct to act as both dependent and independent variables in different relationships (Hair et al.,2014).

The minimum sample size to carry out an SEM is identified as 100 usable responses and to have a robust model fit 500 responses is suggested (Lei & Lomax, 2005). As the sample size was 209 after cleaning and editing it was deemed as an adequate sample size.

4.7.12.1 Steps of a Structural Equation Model

Hair et al. (2010) indicate that an SEM can be subdivided into two clear sub-models, firstly a measurement model which is represented by a CFA model and factor loadings (Stage 1-4) and secondly a structural model which defines the relationships between variables (Stage 5-6).

Hair et al., (2010, p. 565) has identified the following six stages in structural equation modelling.

Stage 1: Defining Individual Constructs

Stage 2: Developing the overall measurement model

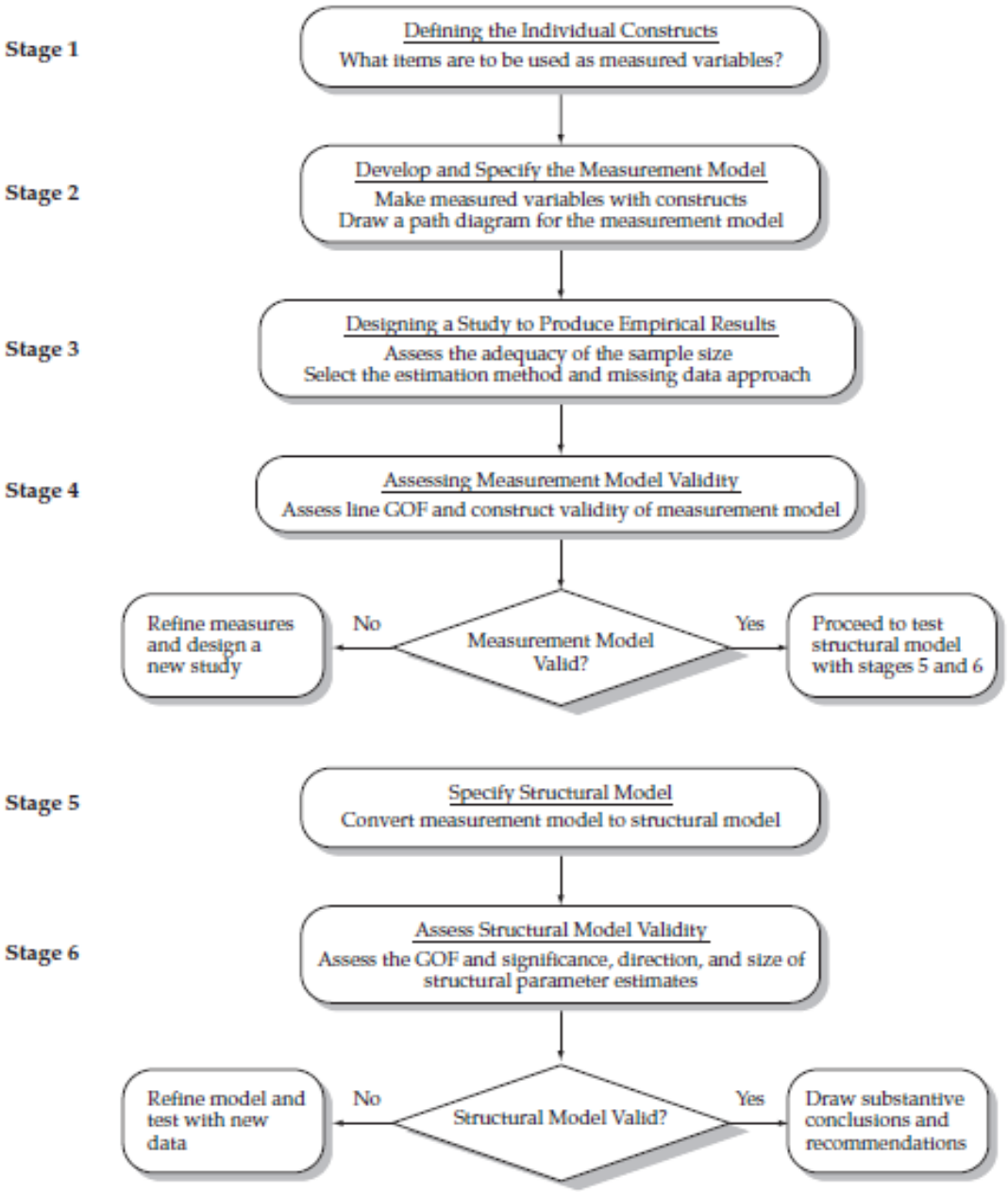
Stage 3: Designing a study to produce empirical results

Stage 4: Assessing the measurement model validity

Stage 5: Specifying the structural model

Stage 6: Assessing the structural model validity

Figure 2: Steps for Structural equation model



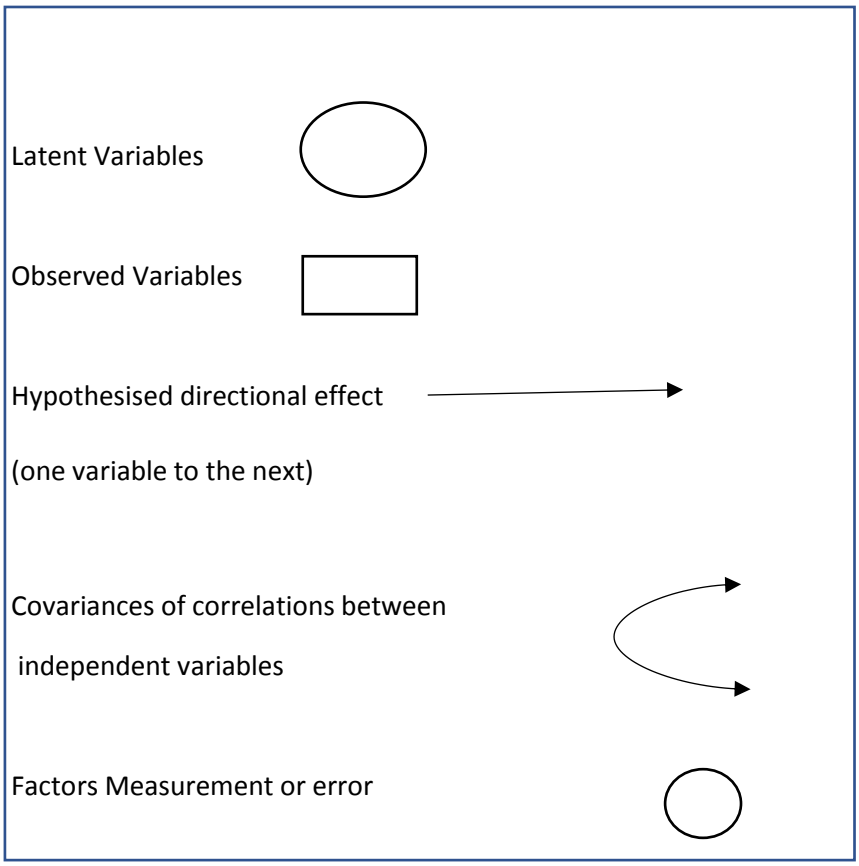
Hair et al., (2010, p.566).

4.7.12.2 Structural modelling Output.

The output of an SEM measurement model and structural model is in a path diagram format. The format is a visually pleasing way of presenting results as it makes it easy to indicate the relationship between constructs. The diagram shows the direction of the relationship and the strength of the relationship between constructs and this makes it easier to analyse the output (Byrne, 2016).

The graphical elements that make up a model are described and illustrated below.

Table 4: Graphical Elements



In the SEM diagram, each endogenous variable has an error term, and the CFA was fixed at zero as it is utilised to test a measurement theory within and between covariances and it is not an estimate. In the CFA the measured variables were permitted to load on only one construct. All the latent factors in the CFA were also statistically identified.

4.7.12.3 Model fit analysis

The measurement model and the structural model were both assessed for model fit. Several model fit indexes were utilised to determine the model fit. The model fit identifies the difference between the theory and the reality. It does this by comparing the estimated covariance matrix which represents the theory with observed covariance matrix which represents the reality. If the values of the matrix are similar, it can be concluded that a good model fit is achieved. To determine if the data and the specified model had a good model fit the measurement model validity was established by determining the acceptable levels of goodness-of-fit (GOF). The aim of producing the GOF is to produce a fit statistic which is less sensitive to the sample size. The ideal range for the GOF index is between the values of 0 and 1. The closer the value is to 1 the better the model fit is. Typically, a value of 0.90 and higher can be considered as an indication of a good model fit.

The researcher also reviewed the degrees of freedom (DF) to identify the availability of mathematical information to estimate the model parameters. The P-value from the chi-square test was reviewed to determine if the chi-square test was significant. The chi-square measure indicates the difference between the estimated and the observed covariance matrices. A significant result indicates that the two covariance matrices are statistically different, and this could point to a problem with the model fit of the model. Therefore, the results were reviewed for relatively small chi-square value. Therefore, the smaller the chi-square value, the better the value supports the proposed theoretical model that is being tested

“The Root means square error of approximations attempts to correct for the tendency of the X^2 GOF test statistic to reject models with a large sample or a large number of observed variables” (Hair et al., 2014, p.584). The measure looks further than exploring just exploring how well the model fits the sample but explores how well the model fits its population. The measure adjusts for the complexity of the model and sample size. The measure does this by including the complexity of the model and the sample size in its computation. Lower values of RMSEA indicate better levels of model fit.

"The comparative fit index is an incremental fit index that is an improved version of the normed fit index" (Hair et al., 2014, p.584). The CFI is used to confirm if there is any discrepancy between, he data set and the theorised model. To confirm if the CFI was acceptable the first step was to obtain a rough model, and this was done by entering the Pattern Matrix into Amos 25 and converting the EFA into a CFA. In the CFA model created the assumption was made that all the construct was related to all the other constructs. The new model that was created specified fewer relationships among the constructs because it was hypothesized that not every construct had a direct relationship with every construct. In the SEM more of the relationships are fixed to zero. Because these relationships are set to zero, they are not allowed to be estimated by the model, therefore, making the SEM more constrained than the measurement model. The measurement model and the structural model chi-square values were compared to determine if the constraint that was added to the chi-square value had significantly added to the X^2 value. If the values were similar, it indicated that the constraint that was added to the model did not have a significant impact.

4.7.13 Factoring Extraction and analysis

Common Factor analysis is an abstraction method; it is a hypothetical construct that affects at least two of the measurement variables. The researcher wanted to estimate the common factors that could contribute to the variance in the variables. When conducting a CFA, the CFA considered only the common variances in the data, and it sought to arrive at the lowest number of factors that could account for the common variance (correlation) of the set of variables. The CFA was concerned with determining if the number of factors that "confirmed" the pre-established theory. It aimed to identify if items loaded as predicted on the expected number of factors. The number of factors was hypothesized beforehand and this the researcher was able to validate the scales and the hypothesised factor structure. (Byrne, 2016 ; Schmitt & Kuljanin, 2008)

4.7.14 Validity

Validity analysis verified if the measurement tool used by the researcher were measuring what the researcher intended it to measure. Validity analysis tells the researcher how accurate the chosen measurement tool was.

In the quantitative approached that was followed the validity and reliability played a pivotal role. To determine if construct validity was present it was important to look at the components that made up construct validity namely (1) convergent validity and (2) discriminant validity.

4.7.15 Convergent Validity

Convergent validity is the " extent to which indicators of a specific construct converge or share a high proportion of variance in common" (Hair, Black, Babin, Anderson & Tatham, 2006,p.601). The standardised loading estimates for validity should ideally be 0.7 or higher, but a loading value greater than 0.5 is still acceptable. To achieve the suggested levels of adequacy, the variance extracted had to be 0.5 or higher (Hair et al., 2006).

The convergent validity was checked by determining the average variance extracted (Ave) According to Fornell & Lacker (1981) the AVE compares the amount of variance in a construct to the amount of variance that is due to measurement error (Fornell & Lacker, 1981). AVE values higher than 0.5 is generally accepted as acceptable.

4.7.15.1 Discriminant validity

"Discriminant validity is the extent which a construct is truly distinct from other constructs both regarding how much it correlates with other constructs and how distinctly measured variables represent only this single construct" (Hair et al., 2006,p.601).

The model was checked for discriminant validity. Discriminant validity is present in a model when the variance extracted estimates for two factors are smaller than the correlation of between the two factors (Hair et al., 2006).

The discriminant validity which is indicated by the Maximum Shared Squared Variance (MSV) was calculated by using the shared variance of the constructs in the model and calculating the square root of these values (Hair et al.,2010). The AVE and the MSV were compared to determine if any discriminant validity was present. If the MSV coefficient value was greater than the AVE coefficient value, it indicated the presence of discriminant validity. In an instance where it is found that the MSV was greater than the AVE, an additional step was introduced

into the process. The square root of the AVE for the constructs was compared to the corresponding correlation values of the other constructs in the model (Hajizadeh and Zali,2016). If the value of the square root had been greater than the correlations estimates, this indicates issues regarding discriminant validity, and if it was found that it is not the case, then it indicated that there were no concerns regarding discriminate validity.

4.7.15.2 Reliability

Reliability of data assesses whether the research conducted yields consistent results (Onen, 2016). The reliability of each of the different construct in the model was assessed by using a Cronbach's alpha test (Lin, Lin, & Chang, 2017). A value of >0.70 indicates that the data is reliable. Values higher than 0.7 indicates adequate convergence or internal consistency.

A composite Reliability Coefficient (CR) was used as a second measure to test the reliability. Peterson and Kim, (2013) have indicated that it has been found that a Cronbach's Alpha tends to underestimate the true reliability. The Composite Reliability is used to strengthen the reliability analysis variance components. A Cronbach Alpha has been identified as a constraint version of CR, and therefore the estimates of reliability are on average larger when making use of CR.

4.7.16 SEM Measurement Model

Table 5: SEM Measurement model steps

Step 1 :			
Step	**Method/Measure**		**Threshold/Ranges**
Factor Analysis	CFA	Factor Loadings	Acceptable : >0.5
		Correlation Estimates	<0.7
Step 2:			
Step	**Method Measure**		**Threshold/Ranges**
Validity	Convergent Validity	AVE	>0.5
		MSV	AVE>MSV
	Correlation & Square root of AVE's Matrix		The square root of AVE >Correlation
Step 3 :			
Step	**Method/Measure**		**Threshold/Ranges**
Reliability	Cronbach's Alpha		.0.8
	CR Coefficient		Acceptable : 0.6 - 0.7
			Good: > 0.7
Step 4:			
Step		**Method/Measure**	**Threshold/Ranges**
Model Fit Analysis	Absolute fit indices	Chi-square (X^2) / degree of freedom (CMIN/df)	< 3 good; 5 sometimes acceptable
		Goodness-of-Fit -Index (GFI)	>.80 acceptable ; >.90 good
		Root Mean Square Error of Approximation (RMSEA)	<.05 good : .05 to .1 moderate; >.1 bad
		Comparative Fit index (CFI)	>.80 sometimes acceptable; >.90 good

4.7.17 SEM - Structural Model

Similarly, to the measurement model, the SEM is also displayed in a graphical format. It was key to determine the model fit of the SEM. Although the measurement and structural model has been described as similar, there is a vital difference between the two. The main function of the structural model is to analyse the nature and the magnitude of the relationship between the construct (Hair et al.,2006) whereas the measurement model analyses the relationship between latent constructs and variables (XU, Cruz-Machado, Lev & Nickel,2014).

In the SEM path diagram links between construct are depicted, and the relationship that exists between construct is defined. The model also indicates if the relations are direct or indirect. The path estimates in the SEM is seen as the equivalent of the regression coefficient. The path estimates measure the linear relationships between the independent and dependent variables in the model.

A list of constructs was defined that made up the model. Construct available in existing literature were used in the creating the model and these constructs were used to test the model. As the construct was an existing construct, it was not necessary to develop new scales or construct. It was important that all the constructs that were used displayed adequate construct validity.

4.7.18 Common Method Bias: Incorporating Latent Variables

A latent construct is defined as a “hypothesised and unobserved concept that can be represented by observable or measurable variables”(Omar & Rahim, 2015,p.142). Hair et al. (2006) define a latent construct as a construct that “cannot be measured directly but can be represented or measured by one or more variable (indicators). It was possible to measure these latent construct by investigating the consistency among multiple measured variables.

By analysing the model with a common latent factor, the researcher was able to check the model for common method bias. A common latent factor (CLF) was introduced into the model to check if the shared variance across all items was significantly different from zero. A Chi-

square test was conducted to test the difference between the unconstrained model and the model where the paths were constrained to zero.

4.7.19 Model fit analysis

Although a model fit was already done, it was important to do it again in the SEM as it demonstrates enough exploration of alternative models. Every time a model changed or a hypothesis changed the model fit was assessed again. To determine the model fit the modification indices, residuals, and standard measures as described earlier were used. The measures reviewed included CFI, RMSEA and CMIN/ Df. To measure the SEM's model fit a measure was required to measure the predictive accuracy of the overall model. Based on the measure the researcher either had to accept or reject the whole model before he could examine any specific relationship (Kline, 2011).

4.7.20 Mediation analysis

"Mediation represents a situation in which one or more mediator variable(s) explain the processes through which an exogenous construct influences an endogenous construct"(Hair, Hult, Ringle & Sarsedt, (2016, p.312).

The mediation analysis was conducted by making use of the AMOS software. The function of a mediation analysis is that the mediation analysis looks at the direct effect of an independent variable on a dependent variable. "Mediation occurs when a third variable, referred to as a mediator variable, intervenes between two other related constructs"(Hair et al. 2016,p.312)

The researcher was interested to see if LMX (independent variable in the model) affected the dependent variables in the model (project success and turnover intention indirectly through the mediating variable (work engagement).

4.7.21 Linear regression

A linear regression analysis was carried out. The analysis allowed the researcher to analyse the linear relationship that exists between two continues variables. The relationship between

the two continuous variables enables the prediction of the value of a dependent variable based on the value of an independent variable. The analyses indicated to the researcher if the linear regression that exists between two of the variables (constructs) were statistically significant, and it provided an indication of the direction and the magnitude of the relationship between the two variables.

In the Linear regression analysis, five assumptions were made. These assumptions are listed below.

1. It was assumed that a linear relationship exists between the independent variable and the dependent variable.
2. There is independence in the observations
3. Significant outliers are present
4. The variances along the line of best fit remain similar as you move along the line. This is known as homoscedasticity
5. The residuals(errors) of the regression line are approximately normally distributed.

A linear regression allows models to be created that present the relationship that exists between an independent and a dependent variable. In Linear regression models the independent variable is predicting the dependent variable.

- Independent Variable = X
- Dependent Variable = Y

Formulae for a linear regression.

Formulae for one independent variable.

$Y = \beta_0 + \beta_1 X + \varepsilon.$

Formulae for two independent variables.

$Y = \beta + \beta x + \beta x + \varepsilon$

where:

Y = Dependent Variable

β= Slope intercept;

β_1 = Regression coefficient of first variable

X_1 = First independent variable

β_2 = Regression coefficient of first variable

ε = Error term

(Ahmed & M. Abdullahi, 2017)

4.8 LIMITATIONS

The study had the following limitations. The study was in the field of construction project management in South Africa, and therefore the results and the findings of the study cannot be extrapolated to any other project management field. The Study only focussed on the construction industry in South Africa, and for this reason, the results need to be interpreted with caution.

The study had a cross-sectional design, and this is limiting as it only reflects a snapshot in time. Future studies can make use of a longitudinal research design to investigate the long-term relationship between leaders and subordinates. The limitations of the chosen distribution method were that it is a self-reported questionnaire and internet-based surveys are susceptible to being filtered as spam. Making use of survey distribution platforms can also result in surveys being corrupted or not being delivered to its designated recipients.

The research is flawed by implicitly assuming that the quality of the relationship can be measured from one side of the LMX relationship. The researcher only suggested work engagement as a mediating path in the study and acknowledges that other mediating paths or construct may also exist which was not tested in this study.

5 CHAPTER 5: RESULTS

This chapter represents the results of the statistical analysis. The chapter is divided into the following overarching sections: descriptive statistics, reliability and validity of the different measurement instruments that were used and then finally the inferential statistics that were used to test the hypothesis.

The chapter follows the headings and the structure as set out in Section 4.7, the research and methodology section. The section is split into two main sections, firstly the preliminary analysis and secondly the SEM. The two sections are discussed in more depth in this chapter. All the analysis that was done was completed at a 95% confidence interval.

The researcher had access to the data of 288 respondents who accessed the survey. According to Kumar (2014), the processing of quantitative data involves three steps. These steps are the editing of data, the coding of data and the analysis of the data. As the survey responses were captured electronically, the data were already coded numerical data.

Wegner (2016) states data is the lifeblood of any statistical analysis, and for this reason, the data that was used had to be relevant, clean and is the correct format. When data is captured, it is often referred to as being dirty, and therefore data cleaning was required in preparing the data for the analysis process. Firstly the data was checked for any outliers, and secondly, the data was checked for typographic errors. Not using clean data for the statistical analysis would have resulted in producing poor quality results.

5.1 PRELIMINARY ANALYSIS

5.1.1 Data Editing

The original size of the sample was 288. After screening the data, the incomplete responses and outliers were deleted. The outliers were identified using Mahalanobis distance. A total of 79 responses were deleted leaving the final sample size of 209.

5.1.2 Normality Testing

The dataset was analysed for normality. This was done by doing a Kurtosis and a skewness test in SPSS. The Kurtosis test analysed the variances between variables and the ideal parameters for the test are -1 and + 1 (Hair et al., 2016). The result for the Kurtosis test and the Skewness test are reflected in table 7 below, and the results fall within the set parameters. Therefore, it can be stated that the data is normally distributed.

Table 6: Frequencies

Frequencies

Statistics

		LMX_TOT	WEP_TOT	WEE_TOT	WEC_TOT	WE_TOT	PS_TOT	TI_TOT_mod
N	Valid	209	209	209	209	209	209	209
	Missing	0	0	0	0	0	0	0
Mean		40.42	32.08	31.25	25.57	88.89	40.60	9.21
Median		41.00	32.00	32.00	25.00	90.00	40.00	9.00
Std. Deviation		8.635	3.379	4.610	3.735	10.505	5.050	4.871
Variance		74.561	11.417	21.255	13.948	110.364	25.500	23.725
Skewness		-.964	-.523	-1.006	-.523	-.674	-.656	.316
Std. Error of Skewness		.168	.168	.168	.168	.168	.168	.168
Kurtosis		.928	-.574	.805	-.268	-.008	.423	-1.104
Std. Error of Kurtosis		.335	.335	.335	.335	.335	.335	.335

5.1.3 Descriptive Statistics

Biographical information and control variables from the data set were used to compile the descriptive statistics. As there was diversity in responses the most relevant information with regards to the biographical and control variables are presented in the sections 5.1.3.1 and 5.1.3.2 below.

5.1.4 Biographical Data

Table 8 below reflect the frequency distribution of the respondent's age. Respondents between the ages of 20-29 numbered 21 (10.%),between 30-39 numbered 88 (42.1%),between 40-49 numbered 59 (28.2%), between 50-59 numbered 29 (13.9%),between 60-69 numbered 10 (4.8%) and 70 and older numbered 2 (1.0%).

Table 7: Age of respondents

Age

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	20 - 29 years old	21	10.0	10.0	10.0
	30 - 39 years old	88	42.1	42.1	52.2
	40 - 49 years old	59	28.2	28.2	80.4
	50 - 59 years old	29	13.9	13.9	94.3
	60 - 69 years old	10	4.8	4.8	99.0
	70 and up years old	2	1.0	1.0	100.0
	Total	209	100.0	100.0	

Figure 3: Bar Chart of Age Distribution

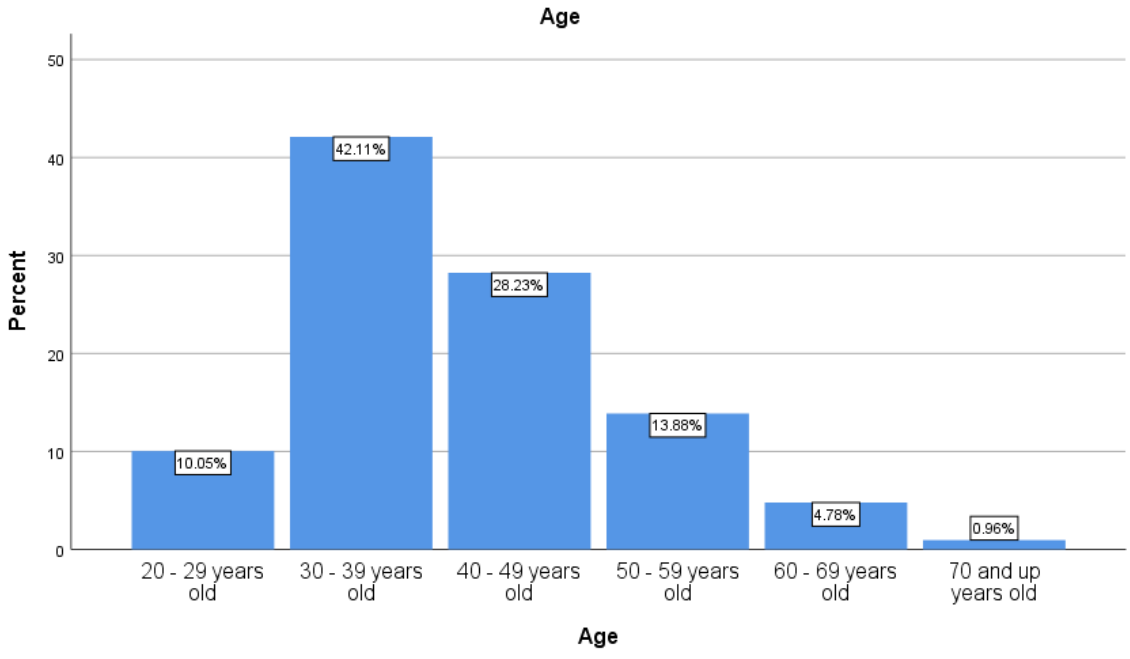


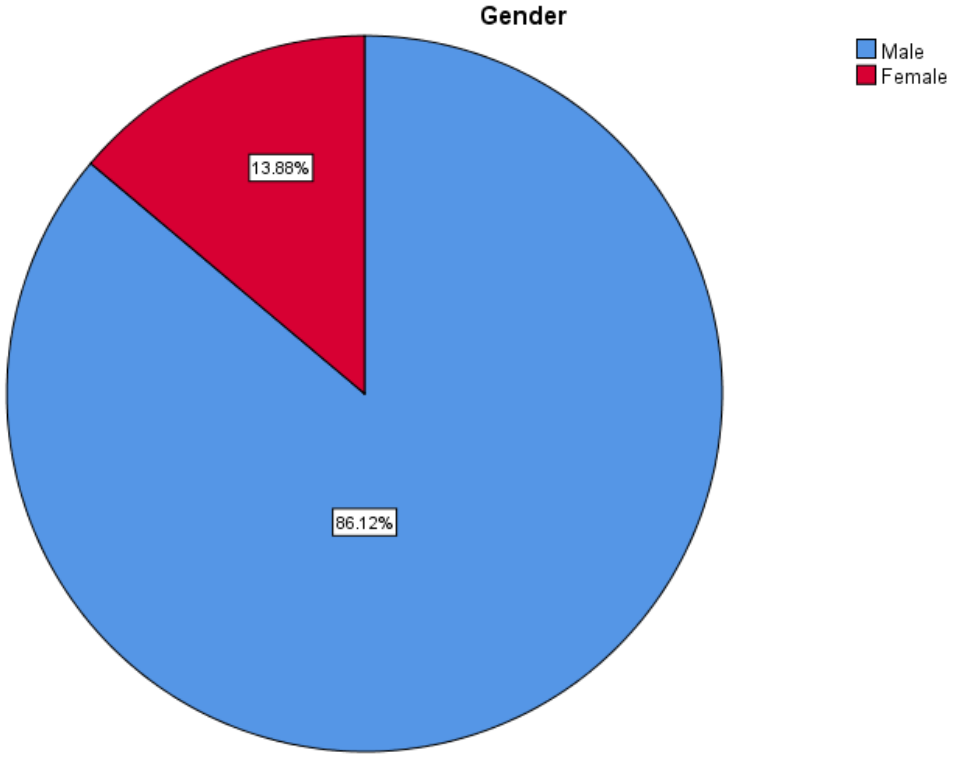
Table 9 below indicates the frequency distribution for the respondents' gender. Most of the survey respondents were male, accounting for 180 (86.1%) and only 29 (13.9%) were Female.

Table 8: Gender of respondents

Gender

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Male	180	86.1	86.1	86.1
	Female	29	13.9	13.9	100.0
	Total	209	100.0	100.0	

Figure 4: Pie graph of gender distribution



5.1.5 Control Variables

A total of 288 responses were received, and of these 288 responses, 59 respondents stated that they were not active construction project managers. These responses were deleted on the basis that these respondents were not active construction project managers.

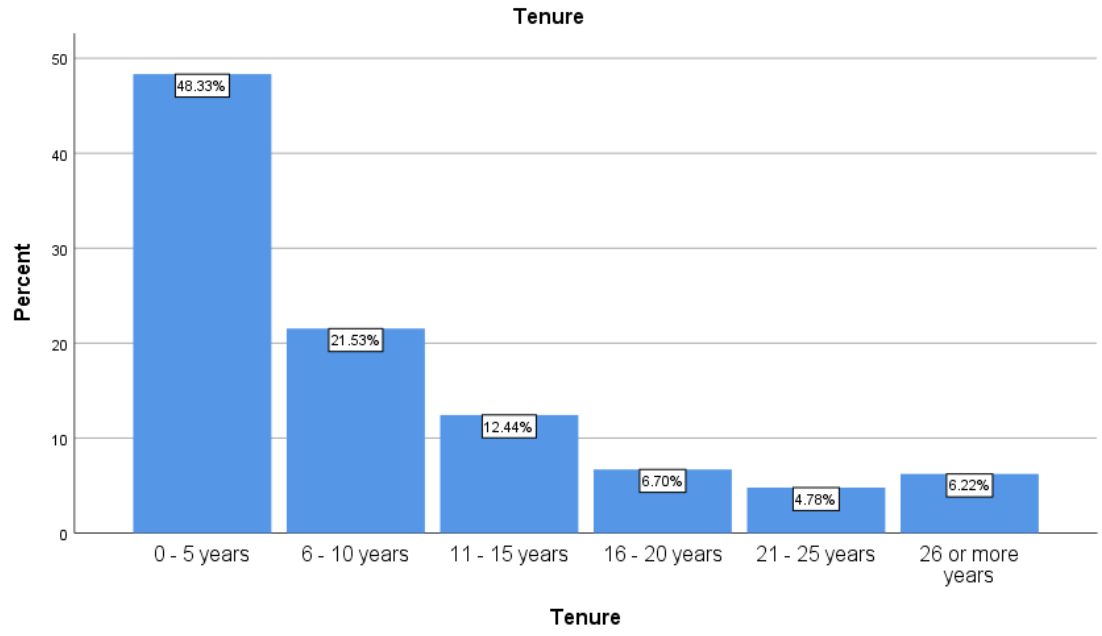
Table 10 below indicates the frequency distribution of the respondents 'tenure at their organisations. Respondents with a tenure between 0-5 years numbered 101 (48.3%), respondents with a tenure between 6-10 years numbered 45 (21.5%) , between 11-15 years numbered 26 (12.4%) , between 16-20 years numbered 14 (6.7%) ,between 21-25 years numbered 10 (4.8%) and a tenure of 26 or more years numbered 13 (6.2%). All these responses were utilised in the analyses of the data.

Table 9: Tenure of respondents

Tenure

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	0 - 5 years	101	48.3	48.3	48.3
	6 - 10 years	45	21.5	21.5	69.9
	11 - 15 years	26	12.4	12.4	82.3
	16 - 20 years	14	6.7	6.7	89.0
	21 - 25 years	10	4.8	4.8	93.8
	26 or more years	13	6.2	6.2	100.0
	Total	209	100.0	100.0	

Figure 5: Bar chart of tenure of respondents



5.1.6 Exploratory Factor Analysis

5.1.6.1 Appropriateness of Data

A Kaiser-Meyer-Olken and Bartlett's test was carried out to confirm the appropriateness of the data and if the researcher could proceed with the exploratory factor analysis.

5.1.6.2 KMO Statistics

The Kaiser-Meyer-Olkin (KMO) Measure of Sampling Adequacy indicates whether the variables can be grouped into a smaller set of underlying factors. The KMO varies from 0 to 1 and should be 0.60 or higher to proceed. Higher values closer to 1.0 indicates that a factor analysis may be useful with the data, but as soon as the value drops lower than 0.5 the results of the factor analysis will be useless (Hakimi & Triki, 2014; Worthington & Whittaker, 2006).

The Kaiser -Meyer-Olkin Measure of sampling resulted in a value of 0.925 which is acceptable; this value is well above the acceptability value of 0.60. The results of the test are significant and therefore acceptable. The KMO measure results are meritorious (Kaiser,1974) and this indicated that the data support the use of factor analysis.

5.1.6.3 Bartlett's Test of Sphericity

The Bartlett's test of sphericity was used to test the suitability of the data; the test determines if the data is suitable to be used for advanced statistical techniques (Field, 2007). The results of Bartlett's test of sphericity that was carried out indicated significance ($p < 0.5$) pointing to the presence of relationships between variables. The result of the test indicates that the data set is suitable for a PCA as a result indicate that the matrix is not an identity matrix and the values of Bartlett's test are significant which indicates that factor analysis is appropriate.

The Kaiser-Meyer-Olkin (KMO) and Bartlett's test of Sphericity results are shown below in Table 11below. The data reflected in the table below is suitable for factor analysis as the KMO value is above 0.6, and Bartlett's test is significant (Pallant,2001).

Table 10: KMO and Bartlett's Test

KMO and Bartlett's Test		
Kaiser-Meyer-Olkin Measure of Sampling Adequacy.		.925
Bartlett's Test of Sphericity	Approx. Chi-Square	6748.367
	df	666
	Sig.	.000

5.1.6.4 Commonalities

The reason for conducting a PCA was to identify the commonalities. Commonalities are the extent to which items correlate with all the other items. The higher commonalities are, the better. High levels of commonalities indicate that the variables are loading significantly on to the factors. As a guide any value greater than 0.4 is acceptable. When the results were reviewed for commonalities any value under the extraction value lower than 0.4 was deemed to be a concern. Only the value of LMX 4 was lower than 0.4 at a value of 0.272 which indicates to correlation with another question.

5.1.7 Exploratory Factor Analysis.

5.1.7.1 Initial Principal Component Analysis (PCA)

The PCA was conducted for the factor extraction part of the analysis. The Kaisers criterion was analysed using the Eigenvalue, and the Total Variance explained. The results are presented in Table 12 below.

The PCA considered all the available variances. These variances included the common and unique variances. The “PCA sought a linear combination of the variables to allow for the maximum variance to be extracted” (Das, Paul & Swierczek 2008,p.63). The extraction aimed to arrive at uncorrelated factors also known as orthogonal.

Table 11: Total variance explained

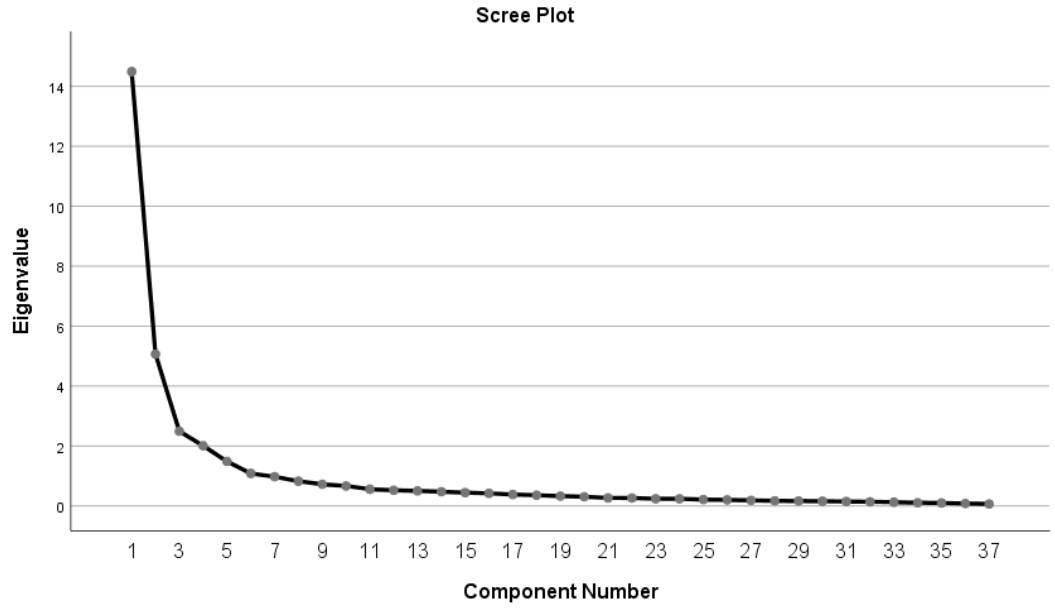
	Initial Eigenvalues			Extraction Sums of Squared Loadings		
Component	Total	% of Variance	Cumulative %	Total	% of Variance	Cumulative %
1	14.489	39.161	39.161	14.489	39.161	39.161
2	5.066	13.693	52.854	5.066	13.693	52.854
3	2.493	6.737	59.591	2.493	6.737	59.591
4	2.009	5.429	65.020	2.009	5.429	65.020
5	1.487	4.018	69.038	1.487	4.018	69.038
6	1.084	2.931	71.969	1.084	2.931	71.969
7	.975	2.636	74.605			
8	.827	2.236	76.841			
9	.723	1.954	78.795			
10	.667	1.804	80.599			
11	.558	1.509	82.108			
12	.524	1.416	83.525			
13	.502	1.358	84.882			
14	.475	1.284	86.167			
15	.445	1.203	87.369			
16	.421	1.138	88.507			
17	.381	1.030	89.538			
18	.358	.967	90.505			
19	.330	.892	91.397			
20	.306	.827	92.224			
21	.268	.724	92.948			
22	.264	.714	93.662			
23	.240	.648	94.310			
24	.238	.644	94.954			
25	.214	.579	95.534			
26	.204	.550	96.084			
27	.185	.501	96.585			
28	.172	.465	97.050			
29	.166	.450	97.499			
30	.157	.425	97.925			
31	.148	.400	98.324			
32	.141	.380	98.704			
33	.125	.338	99.042			
34	.108	.292	99.334			
35	.100	.271	99.604			
36	.083	.223	99.828			
37	.064	.172	100.000			

Extraction Method: Principal Component Analysis.

The principal component analysis showed six components with Eigenvalues above 1. These six components are responsible for 71.969 % of the total variance explained. Of the six components, number one had the highest Eigenvalue at 14.489, and component one was responsible for 39.161% of the total variance. The researcher opted to use the Eigenvalues of the six factors as these were satisfactory. The researcher also opted to use the total variance explained and components that contribute more than 60 % of the total variance are considered satisfactory.

The Scree Plot in figure 6 below is a graphical illustration showing the six values above the value of 1 which is responsible for more than 60% of the variance explained.

Figure 6: Scree Plot



5.1.7.2 Varimax, factor extraction and interpretation of rotated matrix

A Varimax orthogonal rotation was performed to arrive at a Varimax. The Varimax orthogonal rotation allowed the researcher to extract components that maximise the variance explained, and it enabled the researcher to interpret these factors better. The results of the Varimax rotation is reflected in table 30 in the appendices.

The Varimax rotation results supported the extraction of the six components identified earlier. The components that were identified had the highest loadings. The analysis indicated the following results of the six components:

- The first component, project success, included eight items from PS1 to PS8.
- The second component namely LMX included nine items. These items were numbered from LMX 1 to LMX 9. The values are reflected in table 26. Items LMX 7, LMX 8, LMX 2, LMX3, LMX5, LMX 6 and LMX9, indicate a high level of correlation. Items LMX1 and LMX4 indicate lower levels of correlation.
- The third component, physical work engagement, included six items from WEP1 to WEP6. Emotional work engagement item 4 (WEE4) cross-loaded onto component 3 but as the WEE4 principal value was higher than the cross loading value, the WEE4 was kept with component four.
- The fourth component, emotional work engagement, included six items from WEE1 to WEE6.
- The fifth component, turnover intention, included three items from TI1 to TI3 and the values indicated high levels of correlation.
- The six component, cognitive work engagement, included five items from WEC1 to WEC5. WEC had multiple items cross loading onto components three and four. WEC1, WEC3, and WEC2 cross-loaded onto component four and WEC4, WEC5, WEC3 and WEC2 cross-loaded onto component 3. The principle loadings of the WEC items onto component six was still higher in value that the cross loading values and for this reason, the primary loadings were kept.

From the Varimax rotation the analysis results showed that there are some cross-loading factors of emotional work engagement and cognitive work engagement, however, the cross-loading values were lower than the primary loadings and for this reason the researcher opted to use the highest loadings and to group these items under the components witch best suited the research objective. Factor loadings measure the relationship between the items and the factors.

5.1.7.3 Validity

It can be stated that validity is achieved as the rotated component matrix loaded strongly on all the components. On average the loadings were greater than 0.7. Only the WEC average was lower than 0.7 which might indicate the validity concerns. Convergent Validity parameters were met as the all the loadings were higher than 0.5 (Anderson & Gebring 1988).

5.1.7.4 Reliability

To test the reliability a Cronbach's Alpha and the Composite Reliability Coefficient was done for each of the constructs, and the result is reflected in table 14 below (Lin et al., 2017).

Table 12: Cronbach's Alpha

Scale	Cronbach's Alpha
LMX	0.909
WEE	0.939
WEP	0.896
WEC	0.961
PS	0.929
TI	0.885

Table 13: Composite reliability coefficient

Scale	Composite Reliability Coefficient
LMX	0.901
WEE	0.939
WEP	0.898
WEC	0.961
PS	0.929
TI	0.885

The Cronbach's Alpha was greater than 0.8 for all the scales, and the Composite Reliability Coefficient was greater than 0.7 for all the scales, and this is indicating very good reliability. From this, the researcher concluded that the scales are reliable and that all the questions in the survey contributed towards the measurement (Peterson & Kim, 2013).

5.1.7.5 Common Factor analysis

The common factor analysis was used to test the priori model of the underlying structure. It provided the researcher with an indication if the model fitted the data adequately (Matsunga,2010). Common Factor analysis is an abstraction method where a hypothetical construct affects at least two of the measurement variables. The researcher wanted to estimate the common factors that could contribute to the variance in the variables.

5.1.7.6 Measurement Model

The initial measurement model is reflected in figure 7 below. The factor loadings between the constructs and the observed variables were reviewed as well as the correlation estimates. The model had to go through multiple iterations to strengthen the model and to arrive at the final model which is reflected in figure 8 below. During the iterations, WEP 1 and LMX 4 was removed as the components had poor loadings.

Figure 7: Initial measurement model

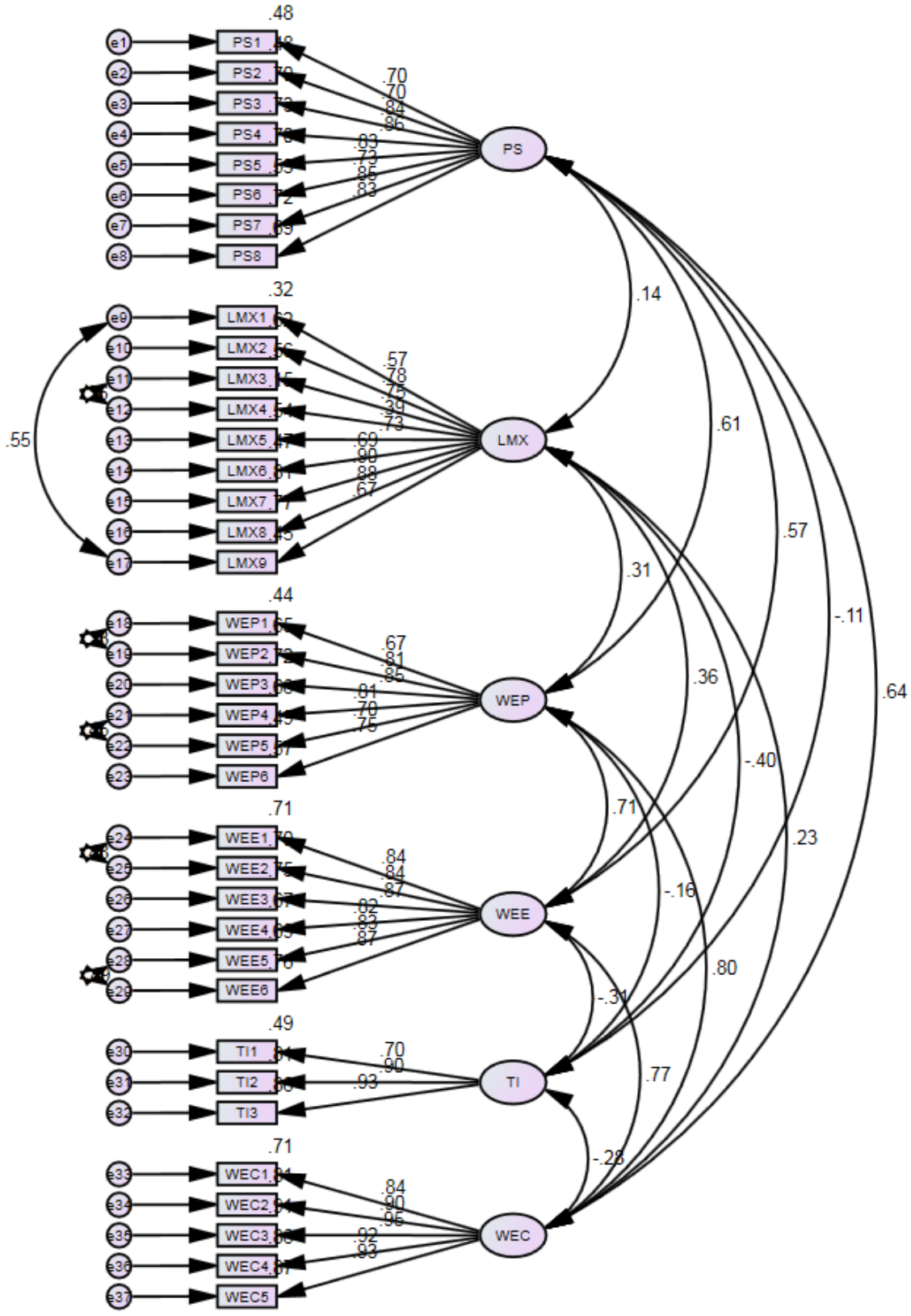
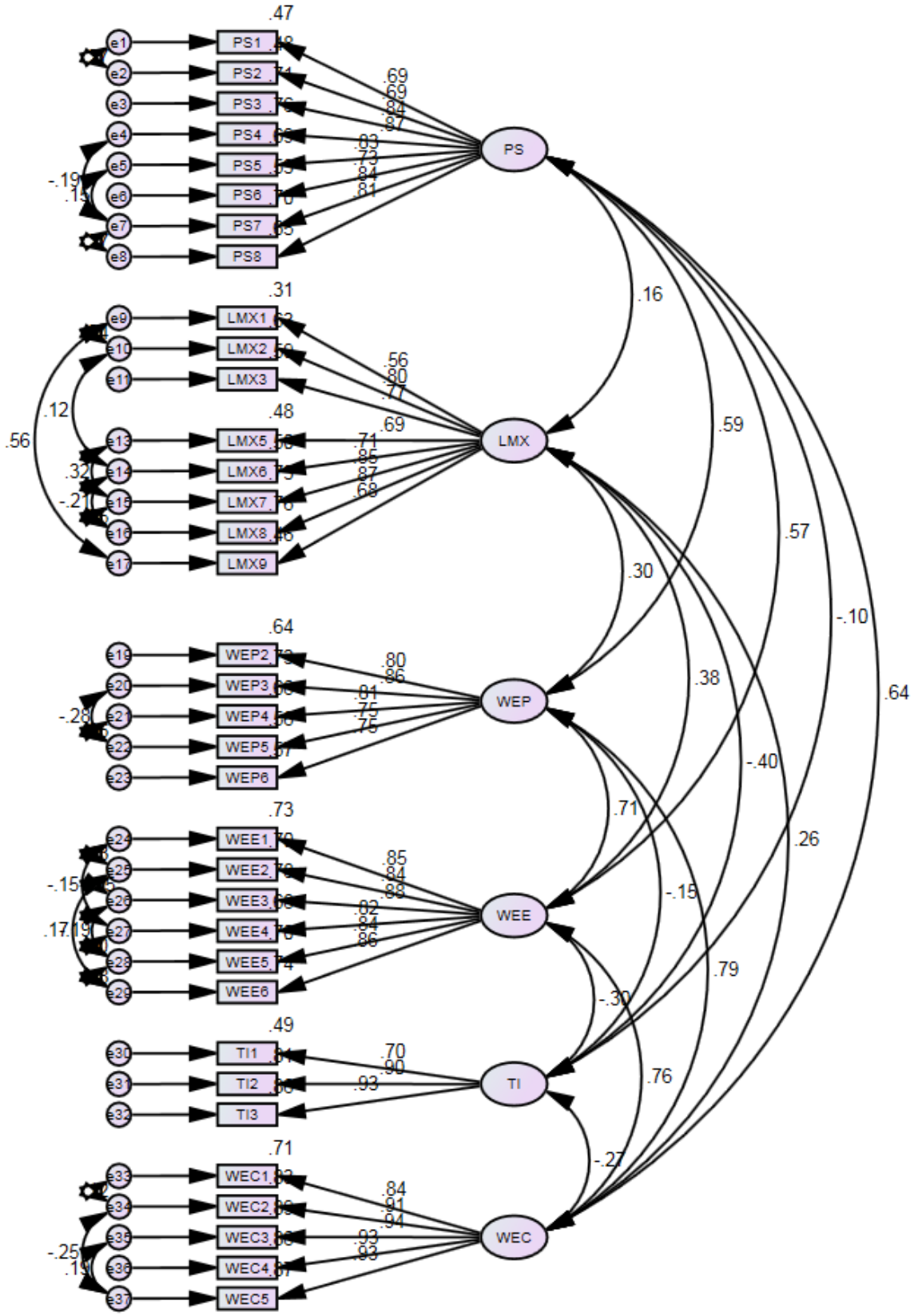


Figure 8: Final measurement model



5.1.7.7 Validity and Reliability of the new model.

As this is a new model, the Validity and Reliability of the model had to be checked. The AVE and MSE values were calculated to confirm the validity of the model. The AVE and MSV values were calculated for each of the constructs. The results are reflected in table 14 below. The AVE values were all greater 0.5 confirming that there were no issues with the convergent validity. The AVE for the WEP, however, was less than the MSV for WEP and this could indicate cross loading between items raising concern regarding discriminant validity. However, the square root of the AVE for the WEP was still less than its correlation with WEC, and therefore the result was still acceptable.

Table 14: Validity and Reliability measures

	CR	AVE	MSV	MaxR(H)	TI	PS	LMX	WEP	WEE	WEC
TI	0.885	0.723	0.157	0.920	**0.850**					
PS	0.929	0.623	0.408	0.937	-0.100	**0.790**				
LMX	0.909	0.558	0.157	0.925	-0.397	0.161	**0.747**			
WEP	0.896	0.633	0.629	0.901	-0.146	0.594	0.298	**0.796**		
WEE	0.939	0.721	0.584	0.940	-0.302	0.566	0.381	0.714	**0.849**	
WEC	0.961	0.832	0.629	0.966	-0.271	0.639	0.256	0.793	0.765	**0.912**

Reliability (>0.7)
CR

TI	0.885
PS	0.929
LMX	0.909
WEP	0.896
WEE	0.939
WEC	0.961

Convergent Validity (>0.5)
AVE

TI	0.723
PS	0.623
LMX	0.558
WEP	0.633
WEE	0.721
WEC	0.832

Discriminant Validity
MSV<AVE

	AVE	MSV	Delta
TI	0.723	0.157	0.565
PS	0.623	0.408	0.215
LMX	0.558	0.157	0.401
WEP	0.633	0.629	0.004
WEE	0.721	0.584	0.136
WEC	0.832	0.629	0.204

5.1.7.8 Common Latent Factor

The model was checked for a common latent factor. The model is reflected in figure 9 below. The results in Table 15 below indicate significance and the presence of a common latent factor. The common latent factor was not removed from the model.

Figure 9: Common latent factor model

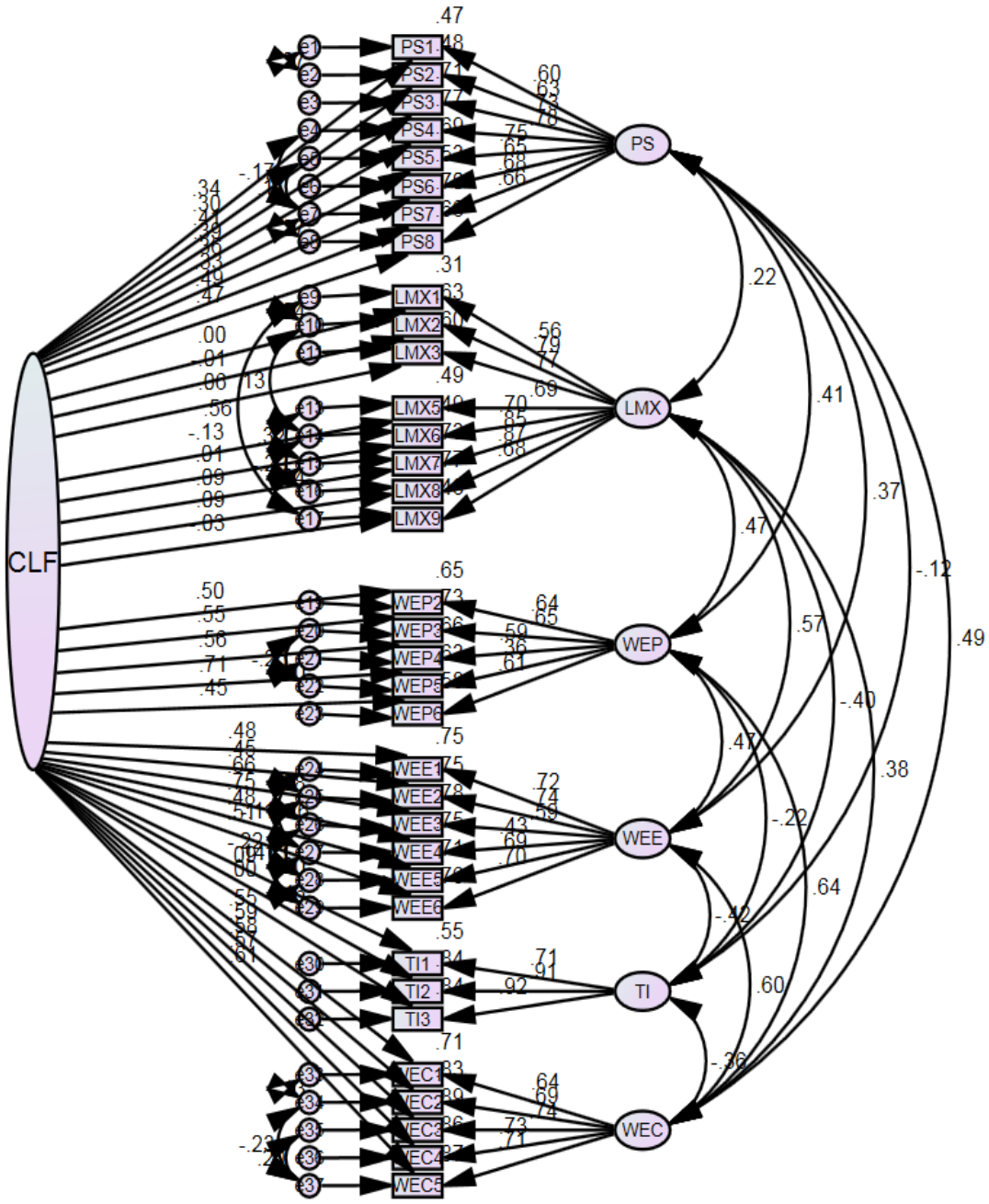


Table 15: Constraint model test

Zero Constraint Test	X^2	DF	Delta	p-value
Unconstrained Model	625.6162	488	X^2 = 97.998 DF = 35	0.0000
Zero Constrained Model	723.6146	523		

5.1.8 Structural Equation Modelling

5.1.8.1 Confirmatory Factor Analysis

The CFA was performed using the SEM analysis function in the IBM Amos 25 software package. The EFA results from preliminary analysis were utilised to confirm the factors that had to be analysed in the structural model. The results from the CFA supported the findings of the EFA. The CFA shows that the sub-constructs that were identified are associated with each of the constructs.

5.1.8.2 Model Fit Analysis

Several tests were run to check the model fit of the model. These tests included the Chi-Square and several model fit indices which are listed and described below. The researcher opted to use .95 as a benchmark in most of the fit indices. The researcher opted not to sacrifice the number of items per construct to achieve model fit but to keep as many items as possible that made logical sense to avoid sacrificing the reliability and validity of the construct.

The methodology that was followed was the best option as all the construct were analysed in one measurement model and not separately. By doing this, the researcher was able to reduce the bias towards confirming the model as it was easier to achieve this by analysing each of the constructs separately and it was easier for a single construct to achieve the fit indices. Another motivation for following the methodology was that the test of discriminant validity and potential item cross -loading would have been impossible unless all the constructs were tested collectively.

Also using multiple indices provided the researcher with an increased level of adequate evidence that the model fit was achieved. Reporting on the chi-square value, the degrees of freedom, the CFI and the RMSEA provides enough information to evaluate the model. The SRMR value is an indication of the badness of fit of the model, and this can be used instead of using RMSEA.

5.1.8.3 Absolute fit indices

Hooper, Coughlan and Mullen (2008) citing McDonald and Ho (2002) described absolute model fit indices as measures " to determine how well an a priori model fits the sample data and demonstrates which proposed model has superior fit" (p.54).

Table 17 below reflects the parameters for the model fit indices.

Table 16: Model fit indices parameters

Measure	Threshold
Chi-square/df (cmin/df)	< 3 good; < 5 sometimes permissible
p-value for the model	> .05
CFI	> .95 great; > .90 traditional; > .80 sometimes permissible
GFI	> .95
AGFI	> .80
SRMR	< .09
RMSEA	< .05 good; .05 - .10 moderate; > .10 bad

Table 18 below reflect the results of the model fit indices tests. The model went through several iterations, and the results of the simplified model are reflected in the column named SIMP 1. When the result in table 18 is compared with the model fit parameters in table 17, it is evident that all the model fit parameters are met, and a good model fit is achieved.

Table 17: Structural model fit indices results

		SM1 start	SM2 improve	SIMP1 simplified
CMIN/DF	<3.00	6.733	1.186	2.286
SRMR	<0.09	0.146	0.032	0.023
GFI	>0.95	0.922	0.989	0.995
AGFI	>0.80	0.781	0.955	0.946
TLI	>0.95	0.597	0.987	0.967
CFI	>0.95	0.808	0.996	0.994
RMSEA	<0.08	0.166	0.030	0.079
PCLOSE	>0.05	0.000	0.620	0.227
HOELTER 0.05	>150	57	353	350

Table 18: Model fit indices

Fit Indices	Calculated Value	Interpretation
CMIN/Df	2.286	Good
GFI	0.995	Good
CFI	0.994	Good
SRMR	0.023	Good
RMSEA	0.079	Good

From the fit indices the researcher concluded that the structural model fits the data satisfactory, and therefore the structural model can be used for the hypothesis analysis.

5.1.9 Structural Model

The Structural model underwent several iterations to arrive at the final simplified structural model presented in figure 12 below. The structural model is based on the hypothesis set out in Chapter three. Several fit indices were conducted to see if the model can be improved as identified in section 5.1.9.3. A simplified model was created out of the data and by changing some of the fit indices.

Figure 10: Final structural model

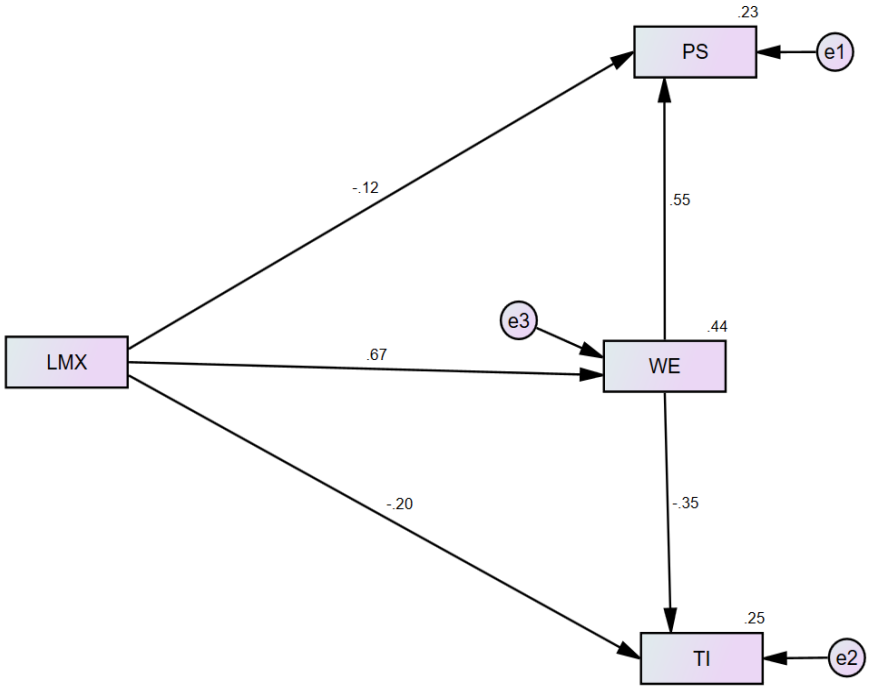


Table 19: Correlation coefficient

Independent variable	Dependent variable	Coefficient	Relationship
LMX	PS	-.12	weak negative relationship
LMX	TI	-.20	weak negative relationship
LMX	WE	.67	strong positive relationship
WE	PS	.55	strong positive relationship
WE	TI	-.35	moderate negative relationship

5.1.10 Mediation Analysis

A mediation model looks to advance the causal sequence between variables and to illustrate the mechanisms through which these variables are related (Mathieu & Taylor,2007)

Two mediation models were generated. The first model explored if WE (work engagement) acted as a mediator between LMX and PS as can be seen in figure 11 below. The second model explored if WE acted as a mediator between LMX and TI as can be seen in figure 12 below.

Figure 11 - Mediation Model 1

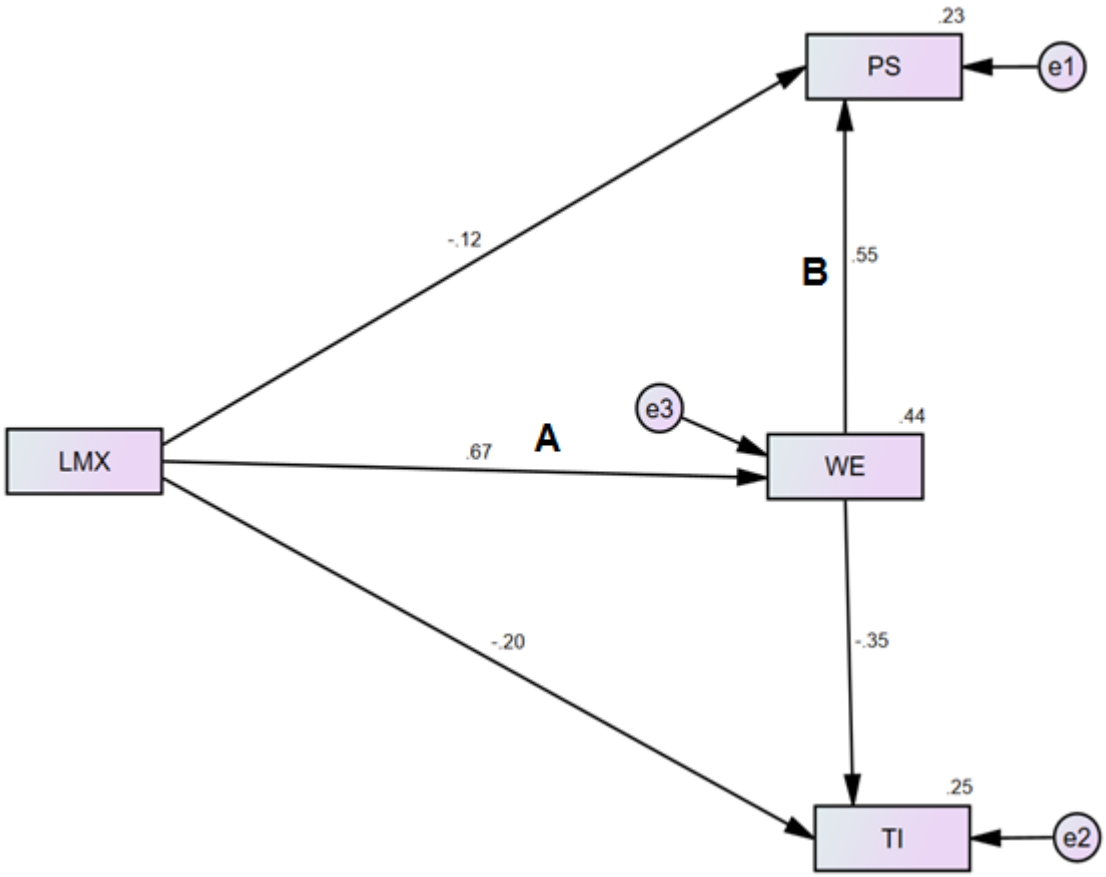


Table 20: LMX - Mediated by WE - PS

Parameter	Estimate	95% Lower	95% Upper	P	
A x B	0.192	0.129	0.268	0.001	
Parameter	SE	SE-SE	Mean	Bias	SE-Bias
A x B	0.035	0.001	0.19	-0.001	0.001

The indirect effect between LMX and PS was explored by the introduction of WE as a mediator. This results from the mediation analysis indicate that at a 95% confidence level that the WE do mediate the relationship between the LMX and PS. The estimated value was calculated to be 0.192 with a standard error of 0.035, and the model was significant at a p-value of 0.001. Therefore it can be stated that PS has a positive relationship with LMX if the relationship is mediated by WE. The VAF was calculated to determine if WE act as a partial mediator or a full mediator.

- VAF = AxB+ (C)

  = 0.67 x0.55 + (C)

  = 0.3685 + (-0.12)

  = 0.2485

The result indicated that partial mediation is taking place as the value falls between the parameter of 0.2 and 0.8 for partial mediation. “Partial mediation occurs when a mediator variable partially explains the relationship between an exogenous and an endogenous construct” (Hair et al. 2017,p.316)

Figure 12: Meditation model 2

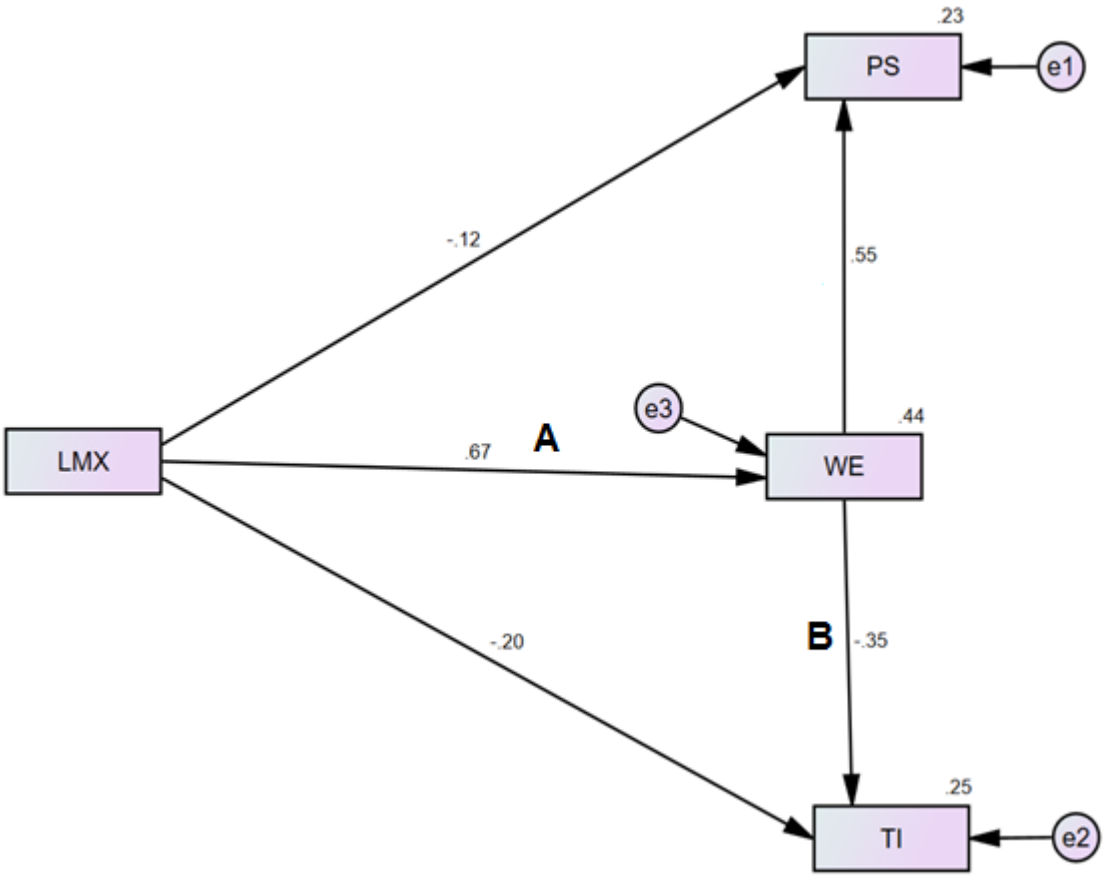


Table 21: LMX - Mediated by WE - TI

LMX - Mediated by WE – TI

		95%	95%		
Parameter	Estimate	Lower	Upper	P	
A x B	-0.307	-0.497	-0.14	0.001	
Parameter	SE	SE-SE	Mean	Bias	SE-Bias
A x B	0.089	0.001	-0.307	0	0.002

The indirect effect between LMX and TI was explored by the introduction of WE as a mediator. This results from the mediation analysis indicate that at a 95% confidence level that the WE do mediate the relationship between the LMX and TI. The estimated value was calculated to be -0.307 with a standard error of 0.089 and the model was significant at a p-value of 0.001. Therefore it can be stated that TI has a stronger negative relationship with LMX if the relationship is mediated by WE. The VAF was calculated to determine if WE act as a partial mediator or a full mediator.

- VAF = AxB+ (C)

  = 0.67 x (-0.35)+ (C)

  = -0.2345 + (-0.20)

  = - 0.4345

The result indicated that partial mediation is taking place as the value falls between the parameter of - 0.2 and - 0.8 for partial mediation. “Partial mediation occurs when a mediator variable partially explains the relationship between an exogenous and an endogenous construct” (Hair et al. 2017,p.316)

5.1.11 Hypothesis Testing

Before the hypothesis testing was done, tests were run to check for Homoscedasticity, Linearity, and Multicollinearity. The purposes of the test were to check if the assumption of correlation and regression were met (Field, 2009).

5.1.12 Homoscedasticity

Homoscedasticity is an assumption that assumes that the variance which exists between the predictor independent variables and the residual term is constant. The homoscedasticity was tested for each of the dependent variables, these included project success, and turnover intention. The regression standardises predicted values were plotted against the regression standardised residuals. The scatterplots are presented in the appendices in figures 24,26,28,30,32,34,36 and 38. The interpretation of the scatterplots is discussed under the hypothesis testing in section 5.1.15.1 to 5.1.15.10.

5.1.13 Linearity

Linearity was assumed during the analysis of the data. Linearity is the assumption that the relationship that exists between the two variables is linear in nature. P-P plots were produced of the respective variables. The P-P plots are presented in the appendices in figures 23,25,27,29,31,33,35, and 37. The interpretation of the P-P plots is discussed under the hypothesis testing in section 5.1.15.1 to 5.1.15.10.

5.1.14 Multicollinearity

Multicollinearity is a test that determines if there is a strong correlation between the independent variables in the multiple regression analysis. If a strong result of multicollinearity is found, it indicates that different independent variables in the model measure the same construct. Field (2009) states that the variance inflation factor (VIF), when calculated through a collinearity statistic, need to be less than ten and if this is the result there are no concerns in terms of multicollinearity. The results for the multicollinearity test are presented in tables 31,34,37,40,43,46,49, and 52 in the appendices.

To check if multicollinearity was present a Variable Inflation Factor (VIF) for each independent Variable was calculated after running a multivariate regression using one of the independent variables as dependent variables and then regressing it on all the remaining independent variables. The independent variables were then swapped out one at a time and the test re-run. All the VIF results were less than 10 (VIF<10) which indicates that there are no issues with multicollinearity.

5.1.15 Hypothesis Testing

5.1.15.1 Hypothesis one

- **Null hypothesis one ($H1_0$):** No significant relationship exists between leader-member exchange and project success.
- **Alternate Null hypothesis one ($H1_1$):** - A significant relationship exists between leader-member exchange and project success.

A regression analysis test was conducted, and the results of the analysis found a beta coefficient of 0.243. The model is statistically significant at a 95 % confidence interval. The results can, therefore, be interpreted as indicating a moderate positive relationship between leader-member exchange and project success. The linear regression test also provided insight into the effect of leader-member exchange on project success. To assess linearity between project success and leader-member exchange a P-P plot with a superimposed regression line

was plotted. The P-P Plot is presented in figure 23 in the appendices. The visual inspection of the P-P plot indicated a linear relationship between the variables. Figure24 also in the appendices confirm that the assumption of homoscedasticity is met.

The Durbin -Watson statistic for the data was reviewed. The Durbin – Watson statistic for the data is 2.219 as can be seen in table 31. The Durbin- Watson statistic can range from 0-4, and the closer the value is to approximately two the better it is as this indicates that there is no autocorrelation between residuals. Therefore it can be stated that there was independence of residuals, as assessed by a Durbin-Watson statistic of 2.219.

The predication equation was: PS = 2.667 x (0.118 x LMX). Leader-member exchange statistically significantly predicted project success, $F(1,207)=12.893$, $P<.0005$, accounting for 5.9% of the variation in project success with adjusted $R^2 = 5.4\%$, a small size effect according to Cohen (1988).

The Linear regression analysis further indicated that there is a moderate positive correlation between leader-member exchange and project success as can be seen from the results in table 22 below.

Table 22: LMX and PS Correlation

Correlations

		PS	LMX
Pearson Correlation	PS	1.000	.243
	LMX	.243	1.000
Sig. (1-tailed)	PS	.	.000
	LMX	.000	.
N	PS	209	209
	LMX	209	209

The null hypothesis was therefore rejected in favour of the alternate hypothesis.

5.1.15.2 Hypothesis Two

- **Null hypothesis two ($H2_0$):** - No significant relationship exists between leader-member exchange and turnover intention.

- **Alternate Null hypothesis one ($H2_1$):** - A significant relationship exists between leader-member exchange and turnover intention.

A regression analysis test was conducted, and the results of the analysis found a beta coefficient of -0.432. The model is statistically significant at a 95 % confidence interval. The results can, therefore, be interpreted as indicating a moderate negative relationship between leader-member exchange and turnover intentions. The linear regression test also provided insight into the effect of leader-member exchange on turnover intention. To assess linearity between turnover intention and leader-member exchange a P-P plot with a superimposed regression line was plotted. The P-P Plot is presented in figure 25 in the appendices. The visual inspection of the P-P plot indicated a linear relationship between the variables. Figure 26 also in the appendices confirm that the assumption of homoscedasticity is met.

The Durbin -Watson statistic for the data was reviewed. The Durbin- Watson statistic can range from 0-4, and the closer the value is to approximately two the better it is as this indicates that there is no autocorrelation between residuals. Therefore it can be stated that there was the independence of residuals, as assessed by a Durbin-Watson statistic of 2.219 as can be seen in table 34 in the appendices.

The predication equation was: TI = 5.962 x (-0.642 x LMX). Leader-member exchange statistically significantly predicted turnover intention, $F(1,207)=47.612, P<.0005$, accounting for 18.7% of the variation in turnover intention with adjusted R^2 = 18.3%, a moderate size effect according to Cohen (1988).

The Linear regression analysis further indicated that there is a moderate negative correlation between leader-member exchange and turnover intention as can be seen from the results in table 23 below.

Table 23: LMX and TI Correlations

Correlations

		TI	LMX
Pearson Correlation	TI	1.000	-.432
	LMX	-.432	1.000
Sig. (1-tailed)	TI	.	.000
	LMX	.000	.
N	TI	209	209
	LMX	209	209

The null hypothesis was therefore rejected in favour of the alternate hypothesis.

5.1.16 Hypothesis three

As work engagement is a higher order construct made up made cognitive work engagement, emotional work engagement and physical work engagement and the linear regression analysis was done for each of the sub-constructs.

5.1.16.1 Hypothesis three (a)

- **Null hypothesis one ($H3a_0$):** - No significant relationship exists between cognitive work engagement and project success.
- **Alternate Null hypothesis one ($H3a_1$):** - A significant relationship exists between cognitive work engagement and project success.

A regression analysis test was conducted, and the results of the analysis found a beta coefficient of 0.325. The model is statistically significant at a 95 % confidence interval. The results can, therefore, be interpreted as indicating a moderate positive relationship between cognitive work engagement and project success. The linear regression test also provided

insight into the effect of cognitive work engagement on project success. To assess linearity between project success and cognitive work engagement a P-P plot with a superimposed regression line was plotted. The P-P Plot is presented in figure 35 in the appendices. The visual inspection of the P-P plot indicated a linear relationship between the variables. Figure 36 also in the appendices confirm that the assumption of homoscedasticity is met.

The Durbin -Watson statistic for the data was reviewed. The Durbin- Watson statistic can range from 0-4, and the closer the value is to approximately two the better it is as this indicates that there is no autocorrelation between residuals. Therefore it can be stated that there was the independence of residuals, as assessed by a Durbin-Watson statistic of 2.045 as can be seen in table 49 in the appendices.

Cognitive work engagement statistically significantly predicted project success, $F(3,205)=20.909$, $P<.0005$, accounting for 23.4% of the variation in project success with adjusted R^2 = 2.3.3%, a moderate size effect according to Cohen (1988).

The Linear regression analysis further indicated that there is a moderate positive correlation between cognitive work engagement and project success as can be seen from the results in table 24 below.

Table 24: PS - WEC,WEE,WEP Correlations

Correlations

		PS	WEC	WEE	WEP
Pearson Correlation	PS	1.000	.464	.332	.390
	WEC	.464	1.000	.575	.641
	WEE	.332	.575	1.000	.447
	WEP	.390	.641	.447	1.000
Sig. (1-tailed)	PS	.	.000	.000	.000
	WEC	.000	.	.000	.000
	WEE	.000	.000	.	.000
	WEP	.000	.000	.000	.
N	PS	209	209	209	209
	WEC	209	209	209	209
	WEE	209	209	209	209
	WEP	209	209	209	209

The null hypothesis was therefore rejected in favour of the alternate hypothesis.

5.1.16.2 Hypothesis Three (b)

- **Null hypothesis one ($H3b_0$):** - No significant relationship exists between work engagement emotional and project success.
- **Alternate Null hypothesis one ($H3b_1$):** - A significant relationship exists between work engagement emotional and project success.

A regression analysis test was conducted, and the results of the analysis found a beta coefficient of 0.80. The model is not statistically significant at a 95 % confidence interval. The results can, therefore, be interpreted as indicating a weak positive relationship between emotional work engagement and project success. The linear regression test provided insight into the effect of project success on emotional work engagement. To assess linearity between project success and emotional work engagement a P-P plot with a superimposed regression line was plotted. The P-P Plot is presented in figure 35 in the appendices. The visual inspection of the P-P plot indicated a linear relationship between the variables. Figure 36, a scatterplot, also in the appendices confirm that the assumption of homoscedasticity is met.

The Durbin -Watson statistic for the data was reviewed. The Durbin- Watson statistic can range from 0 - 4, and the closer the value is to approximately two the better it is as this indicates that there is no autocorrelation between residuals. Therefore it can be stated that there was the independence of residuals, as assessed by a Durbin-Watson statistic of 1.518 as can be seen in table 49 in the appendices.

The regression analysis test was conducted, and the results of the analysis found a beta coefficient of 0.80. Emotional work engagement did not statistically significantly predict project success, $F(3,205)= 20.909$, $P<.005$, accounting for 23.4% of the variation in project success with adjusted $R^2 = 22.3\%$, a small size effect according to Cohen (1988).

The Linear regression analysis further indicated that there is a strong correlation between emotional work engagement and project success as can be seen from the results in table 24 above.

The null accepted and the alternate hypothesis rejected.

5.1.16.3 Hypothesis Three (c)

- **Null hypothesis one ($H3c_0$):** - No significant relationship exists between physical work engagement and project success.
- **Alternate Null hypothesis one ($H3c_1$):** - A significant relationship exists between physical work engagement and project success.

A regression analysis test was conducted, and the model is not statistically significant at a 95 % confidence interval. The results can, therefore, be interpreted as indicating a moderate positive relationship between physical work engagement and project success. The linear regression test provided insight into the effect of project success on physical work engagement. To assess linearity between project success and physical work engagement a P-P plot with a superimposed regression line was plotted. The P-P Plot is presented in figure 35 in the appendices. The visual inspection of the P-P plot indicated a linear relationship between the variables. Figure 36, a scatterplot, also in the appendices confirm that the assumption of homoscedasticity is met.

The Durbin -Watson statistic for the data was reviewed. The Durbin- Watson statistic can range from 0 - 4, and the closer the value is to approximately two the better it is as this indicates that there is no autocorrelation between residuals. Therefore it can be stated that there was the independence of residuals, as assessed by a Durbin-Watson statistic of 1.723 as can be seen in table 49 in the appendices.

The regression analysis test was conducted, and the results of the analysis found a beta coefficient of 0.146. Physical work engagement did not statistically significantly predict PS, $F(3,205)= 20.909$, $P<.0005$, accounting for 23.4% of the variation in project success with adjusted $R^2 = 22.3\%$, a small size effect according to Cohen (1988).

The Linear regression analysis further indicated that there is a strong correlation between emotional work engagement and project success as can be seen from the results in table 25 above.

The null accepted and the alternate hypothesis rejected.

5.1.16.4 Hypothesis Four

As work engagement is a higher order construct made up made cognitive work engagement, emotional work engagement and physical work engagement and the linear regression analysis was done for each of the sub-constructs.

5.1.16.5 Hypothesis Four (a)

- **Null hypothesis four ($H4a_0$):** - No significant relationship exists between cognitive work engagement and turnover intention.

- **Alternate Null hypothesis four ($H4a_1$):** - A significant relationship exists between cognitive work engagement cognitive and turnover intention.

A regression analysis test was conducted, and the model is not statistically significant at a 95 % confidence interval. The results can, therefore, be interpreted as indicating a strong negative relationship between cognitive work engagement and turnover intention. The linear regression test provided insight into the effect of cognitive work engagement on turnover intention. To assess linearity between turnover intention and cognitive work engagement a P-P plot with a superimposed regression line was plotted. The P-P Plot is presented in figure 37 in the appendices. The visual inspection of the P-P plot indicated a linear relationship between the variables. Figure 38, a scatterplot, also in the appendices confirm that the assumption of homoscedasticity is met.

The Durbin -Watson statistic for the data was reviewed. The Durbin- Watson statistic can range from 0 - 4, and the closer the value is to approximately two the better it is as this indicates

that there is no autocorrelation between residuals. Therefore it can be stated that there was the independence of residuals, as assessed by a Durbin-Watson statistic of 1.093 as can be seen in table 52 in the appendices.

The regression analysis test was conducted, and the results of the analysis found a beta coefficient of -0.255. Cognitive work engagement did not statistically significantly predict turnover intention, $F(3,205)= 24.890$, $P<.0005$, accounting for 26.7% of the variation in project success with adjusted $R^2 = 25.6\%$, a small size effect according to Cohen (1988).

The Linear regression analysis further indicated that there is a strong negative correlation, -0.414, between cognitive work engagement and turnover intention as can be seen from the results in table 25 below.

Table 25: TI - WEC,WEE,WEP Correlations

Correlations

		TI	WEC	WEE	WEP
Pearson Correlation	TI	1.000	-.414	-.489	-.267
	WEC	-.414	1.000	.575	.641
	WEE	-.489	.575	1.000	.447
	WEP	-.267	.641	.447	1.000
Sig. (1-tailed)	TI	.	.000	.000	.000
	WEC	.000	.	.000	.000
	WEE	.000	.000	.	.000
	WEP	.000	.000	.000	.
N	TI	209	209	209	209
	WEC	209	209	209	209
	WEE	209	209	209	209
	WEP	209	209	209	209

The null accepted and the alternate hypothesis rejected.

5.1.16.6 Hypothesis Four (b)

- **Null hypothesis four ($H4b_0$):** - No significant relationship exists between emotional work engagement and turnover intention.

- **Alternate Null hypothesis four ($H4b_1$):** - A significant relationship exists between emotional work engagement and turnover intention.

A regression analysis test was conducted, and the model is statistically significant at a 95 % confidence interval. The results can, therefore, be interpreted as indicating a strong negative relationship between emotional work engagement and turnover intention. The linear regression test provided insight into the effect of emotional work engagement on turnover intention. To assess linearity between turnover intention and emotional work engagement a P-P plot with a superimposed regression line was plotted. The P-P Plot is presented in figure 37 in the appendices. The visual inspection of the P-P plot indicated a linear relationship between the variables. Figure 38, a scatterplot, also in the appendices confirm that the assumption of homoscedasticity is met.

The Durbin -Watson statistic for the data was reviewed. The Durbin- Watson statistic can range from 0 - 4, and the closer the value is to approximately two the better it is as this indicates that there is no autocorrelation between residuals. Therefore it can be stated that there was the independence of residuals, as assessed by a Durbin-Watson statistic of 1.093 as can be seen in table 52 in the appendices.

The regression analysis test was conducted, and the results of the analysis found a beta coefficient of -0.381. Emotional work engagement statistically significantly predicted TI, $F(3,205)= 24.890$, $P<.0005$, accounting for 26.7% of the variation in project success with adjusted $R^2 = 25.6\%$, a small size effect according to Cohen (1988).

The Linear regression analysis further indicated that there is a strong negative correlation, -0.489, between emotional work engagement and turnover intention as can be seen from the results in table 25 above.

The null hypothesis was therefore rejected in favour of the alternate hypothesis.

5.1.16.7 Hypothesis Four (c)

- **Null hypothesis four ($H4c_0$):** - No significant relationship exists between physical work engagement and turnover intention.

- **Alternate Null hypothesis four ($H4c_1$):** - A significant relationship exists between physical work engagement and turnover intention.

A regression analysis test was conducted, and the model is not statistically significant at a 95 % confidence interval. The results can, therefore, be interpreted as indicating a moderate negative relationship between physical work engagement and turnover intention. The linear regression test provided insight into the effect of physical work engagement on turnover intention. To assess linearity between turnover intention and physical work engagement a P-P plot with a superimposed regression line was plotted. The P-P Plot is presented in figure 37 in the appendices. The visual inspection of the P-P plot indicated a linear relationship between the variables. Figure 38, a scatterplot, also in the appendices confirm that the assumption of homoscedasticity is met.

The Durbin -Watson statistic for the data was reviewed. The Durbin- Watson statistic can range from 0 - 4, and the closer the value is to approximately two the better it is as this indicates that there is no autocorrelation between residuals. Therefore it can be stated that there was the independence of residuals, as assessed by a Durbin-Watson statistic of 1.093 as can be seen in table 52 in the appendices.

The regression analysis test was conducted, and the results of the analysis found a beta coefficient of 0.47. Physical work engagement did not statistically significantly predict turnover intention, $F(3,205)= 24.890$, $P<.0005$, accounting for 26.7% of the variation in turnover intention with adjusted $R^2 = 25.6\%$, a small size effect according to Cohen (1988).

The Linear regression analysis further indicated that there is a moderate negative correlation, -0.267 between physical work engagement and turnover intention as can be seen from the results in table 25 above.

The null accepted and the alternate hypothesis rejected.

5.1.16.8 Hypothesis five

- **Null hypothesis five ($H5_0$):** - No significant relationship exists between leader-member exchange, work engagement and project success.

- **Alternate Null hypothesis five ($H5_1$):** - A significant relationship exists between leader-member exchange, work engagement and project success.

A regression analysis test was conducted, and the results of the analysis found a beta coefficient of 0.552 for work engagement and -0.125 for leader-member exchange. The values are statistically significant at a 95 % confidence interval. The combined results can, therefore, be interpreted as indicating a moderate positive relationship between leader-member exchange, work engagement and project success. The linear regression test also provided insight into the effect of leader-member exchange and work engagement on project success. To assess linearity, a P-P plot of project success against leader-member exchange and work engagement with a superimposed regression line was plotted. The P-P Plot is presented in figure 31 in the appendices. The visual inspection of the plot indicated a linear relationship between the variables. Figure 32 also in the appendices confirm that the assumption of homoscedasticity is met.

The Durbin -Watson statistic for the data was reviewed. The Durbin- Watson statistic can range from 0-4, and the closer the value is to approximately two the better it is as this indicates that there is no correlation between residuals. Therefore it can be stated that there was independence of residuals, as assessed by a Durbin-Watson statistic of 1.153 as can be seen in table 43 in the appendices.

Leader-member exchange and work engagement statistically significantly predicted PS, $F(2,206)=74.461$, $P<.0005$, accounting for 25.4% of the variation in PS with adjusted R^2 = 24.7%, a medium-size effect according to Cohen (1988).

The Linear regression analysis further indicated that there is a moderate positive correlation, 0.469 between work engagement and project success and weak positive correlation between leader-member exchange and project success as can be seen from the results in table 26 below.

Table 26: LMX, WE and PS Correlations

Correlations

		PS	WE	LMX
Pearson Correlation	PS	1.000	.469	.243
	WE	.469	1.000	.666
	LMX	.243	.666	1.000
Sig. (1-tailed)	PS	.	.000	.000
	WE	.000	.	.000
	LMX	.000	.000	.
N	PS	209	209	209
	WE	209	209	209
	LMX	209	209	209

The null hypothesis was therefore rejected in favour of the alternate hypothesis.

5.1.16.9 Hypothesis six

- **Null hypothesis six ($H6_0$):** - No significant relationship exists between leader-member exchange, work engagement and turnover intention.

- **Alternate Null hypothesis six ($H6_1$):** - A significant relationship exists between leader-member exchange, work engagement, and turnover intentions.

A regression analysis test was conducted, and the results of the analysis found a beta coefficient of -0.454 for work engagement and -0.298 for leader-member exchange. The values are statistically significant at a 95 % confidence interval. The results can, therefore, be interpreted as indicating a moderate negative relationship between leader-member exchange, work engagement and turn over intention. The linear regression test also provided insight into the effect of leader-member exchange and work engagement on turnover intention. To assess linearity, a P-P plot of turnover intention against leader-member exchange and turnover intention with a superimposed regression line was plotted. The P-P Plot is presented in figure 33 in the appendices. The visual inspection of these two plots indicated a linear relationship between the variables. Figure 34 also in the appendices confirm that the assumption of homoscedasticity is met.

The Durbin -Watson statistic for the data was reviewed. The Durbin- Watson statistic can range from 0-4, and the closer the value is to approximately two the better it is as this indicates that there is no correlation between residuals. Therefore it can be stated that there was independence of residuals, as assessed by a Durbin-Watson statistic of 2.075 as can be seen in table 46 in the appendices.

Leader-member exchange and work engagement statistically significantly turnover intention, $F(2,206)=30.497$, $P<.0005$, accounting for 22.8% of the variation in project success with adjusted $R^2 = 22.1\%$, a medium-size effect according to Cohen (1988).

The Linear regression analysis further indicated that there is a moderate negative correlation, - 0.482 between work engagement and turnover intention and moderate negative correlation between leader-member exchange and turnover intention as can be seen from the results in table 27 below.

Table 27: LMX, WE and TI Correlations

Correlations

		TI	WE	LMX
Pearson Correlation	TI	1.000	-.482	-.432
	WE	-.482	1.000	.666
	LMX	-.432	.666	1.000
Sig. (1-tailed)	TI	.	.000	.000
	WE	.000	.	.000
	LMX	.000	.000	.
N	TI	209	209	209
	WE	209	209	209
	LMX	209	209	209

The null hypothesis was therefore rejected in favour of the alternate hypothesis.

5.1.16.10 Conclusion

Table 28: Summary of hypotheses

Hypothesis	Research Objective	Constructs utilised to test	Model Significant	Hypothesis accepted (null/alternate)
Hypothesis 1	Objective 1	LMX, PS	Yes	Alternate
Hypothesis 2	Objective 1	LMX, TI	Yes	Alternate
Hypothesis 3 a	Objective 2	WEC, PS	Yes	Alternate
Hypothesis 3 b	Objective 2	WEE.PS	No	Null
Hypothesis 3 c	Objective 2	WEP,PS	No	Null
Hypothesis 4 a	Objective 2	WEC, TI	No	Null
Hypothesis 4 b	Objective 2	WEE, TI	Yes	Alternate
Hypothesis 4 c	Objective 2	WEP, TI	No	Null
Hypothesis 5	Objective 3	LMX, WE, PS	Yes	Alternate
Hypothesis 6	Objective 3	LMX, WE, TI	Yes	Alternate

6 CHAPTER 6: DISCUSSION OF RESULTS

The chapter focusses and discusses the results as set out in Chapter five. The structure of the chapter is set out around the research objectives identified earlier, and comparisons are drawn between the findings and the literature that was reviewed in Chapter two.

6.1 DESCRIPTIVE STATISTICS

The researcher firstly reviewed the descriptive statistics, and this was done to form a greater understanding of the context of the results. Included within the descriptive statistics were some interesting results which assisted the researcher with the interpretation of the data that were obtained in the statistical analysis process.

In total there where 288 responses collected. Some of these responses had to be excluded as the respondents are not working as construction project managers. The researcher was able to utilise 209 responses and the total a response rate was three per cent.

Most of the respondents were males between the ages of 30 and 39 years and have been active construction project managers between 0 and 5 years. The second biggest response group was from the age category 40 and 49 years. There was a good response rate across all the age groups except in the age group 70 years and older. Only two respondents from this age group completed the survey, and this could be because of the retirement age in the industry.

Most of the respondents have only had a short tenure in the industry. Out of the 209 responses utilised 101 of these responses were in the 0-5 years category, and this agrees with some of the existing literature that construction project management roles might not have been a person first career choice and that many individuals have moved into these types of positions later in their careers (Savelsbergh, Havermans, & Storm, 2016). There were only 23 responses in total where the individual had more than 20 years' experience in the industry, and this could indicate that a construction manager does not stay industry for an extensive period.

An interesting observation from the descriptive statistics is that only 29 usable female responses were received. The small number of females can be an indication of several possible things such as the possibility that females tend to avoid following a career as construction project managers, females might not be as willing to complete online surveys as their male counterparts, and that construction project management is mainly a male-dominated industry.

6.2 OVERVIEW OF CONSTRUCTS

The LMX construct was measured by using an adaptive scale form Henson, Heischmidt, and Mardanov (2008). The scale included nine items. An exploratory factor analysis was carried out, and only eight items were used as high factor loadings were observed on these items. A reduction in the number of items resulted in easing the interpretation of the analysis. Item LMX 4 was removed, and all other items were kept as these met all the validity requirements as confirmed by the factor analysis. The result of 0.909 for the Cronbach alpha test was very similar to the results found by Henson, Heischmidt, and Mardanov (2008) in their study.

The mean score for the LMX construct is reported as 4.49 which compares well to the mean results of 4.54 reported by Henson et al. (2008). The mean score indicated an average response rate that was close to “somewhat agree “ and therefore it can be suggested that there is a moderate level of leader-member exchange in the sample.

6.2.1 Work Engagement

The work engagement constructs as a high order construct were divided into a further three subscales namely emotional work engagement, cognitive work engagement, and physical work engagement as this align with the view of Khan (1992) who states that work engagement forms part of the larger sphere of employee engagement. Agarwal et al., (2012) citing Kahn 1992 states that “engagement is discretionary effort, achieved through the behavioural investment of physical, cognitive, and emotional energy in work roles”(p.210).

The three different constructs were measured by using a scale previously used by Rich et al. (2010) which is based on literature from Khan (1990). Each of the work engagement constructs had its own set of questions. Cognitive work engagement was measured by using five questions, emotional work engagement was measured using six questions, and physical was measured using five questions. The validity of all these questions was confirmed by carrying out the exploratory factor analysis. If was found that question WEP 1 had cross-correlation during the CFA and was therefore removed to strengthen the model.

The Cronbach Alpha result for the work engagement was 0.920 which compares to the Cronbach Alpha range of 0.890 to 0.940 described by Rich, Lepine and Crawford (2010) in their work engagement study. The mean score for the WE construct was reported as 5.23 which is higher than the 3.06 reported by Saks (2006). The mean score indicated an average response rate that was close to “somewhat agree “, and therefore it can be suggested that there is a moderate level of work engagement in the sample.

6.2.2 Project Success

The project success construct was measured using an eight-item scales used previously by Maqbool, Sudong, Manzoor and Rashid (2017). All the questions met the necessary conditions for validity as confirmed by the exploratory factor analysis. High factor loadings were observed after Varimax, and therefore all eight questions were used in the scale. The Cronbach Alpha achieved for the project success scale was 0.929 which is lower than the internal reliability 0.945 identified by Maqbool et al. (2017).

The mean score for the project success construct is reported as 5.08 which exceeded the mean results of 4.16 reported by Maqbool et al. (2017). It is, however, important to note that Maqbool et al. (2017) used a seven-point Likert scales whereas the researcher used a six-point Likert scale. The mean score indicated an average response rate that was close to “agree “ and therefore it can be suggested that there is a fairly high level of project success in the sample.

6.2.3 Turnover Intentions

Turn Over intention was measured using a three items turnover intention scale (Neira-fontela & Castro-casal, 2014). The validity of the three questions was confirmed by the exploratory factor analysis. All the factor loadings observed after doing a Varimax rotation was reasonably high, and therefore all three question were kept as part of the scale. The Cronbach's alpha test results for scale was and 0.878 which is comparable to the internal reliability of 0.845 reported by Yang, Li, Zhu, Li, and Wu (2017) in a previous turnover intention study.

The mean score for the turnover intention construct is reported as 3.07 which is lower than the mean results of 4.16 reported by Maqbool et al. (2017). The mean score indicated an average response rate that was close to "slightly disagree ", and therefore it can be suggested that there is a low level of turnover intention in the sample.

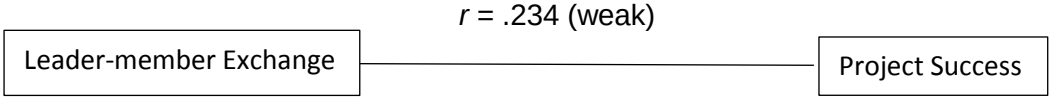
6.3 RESEARCH HYPOTHESIS DISCUSSION

6.3.1 Hypothesis one

- **Null hypothesis one ($H1_0$):** No significant relationship exists between leader-member exchange and project success.
- **Alternate Null hypothesis one ($H1_1$):** - A significant relationship exists between leader-member exchange and project success.

The results of the regression analysis indicate that a significant relationship does exist between LMX and project success. Based on the results the null hypothesis was rejected, and the alternate hypothesis accepted.

Figure 13: Association between the dependent variable project success and leader-member exchange



The researcher concludes from the results that leader-member exchange does predict project success. Research hypothesis one was formulated to answer research objective one which aimed to identify the relationship between leader-member exchange and project success.

The results of the study indicate that higher levels of good quality leader-member exchange relationship between leaders and subordinates will increase the chances of achieving project success. Higher chances of project success positively impact organisational outcomes. These conclusions align with the findings and the views of Blaskovics (2016) who made a case that management should constantly be aware of the type of relationship they form with their employees and this can affect the job performance and engagement of employees. The findings of the study and the work of Blaskovics (2016) builds on the work of Dansereau et al. (1975) who stated that the quality of relationships does have important follower outcomes.

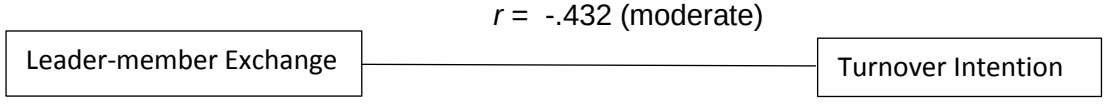
6.3.2 Hypothesis Two

- **Null hypothesis two ($H2_0$):** - No significant relationship exists between leader-member exchange and turnover intention.

- **Alternate Null hypothesis one ($H2_1$):** - A significant relationship exists between leader-member exchange and turnover intention.

Research hypothesis two was tested by running a regression analysis between the dependent and independent variable. The interaction between leader-member exchange and turn over intention was found to be significant.

Figure 14: Association between the dependent variable turnover intention and leader-member exchange



Based on the results, the null hypothesis was rejected, and the alternate hypothesis accepted. From the results, the researcher concluded that leader-member exchange has an impact on the turn over intentions of employees. Hypothesis two was formulated to answer research objective one which looked at the relationship between LMX and turnover intentions.

The findings agree with the work done by Kumar and Singh (2012) and the work of Fairlie (2011) which indicates that LMX negatively correlates with role conflict and turnover intentions and that a strong correlation exists between the predictors and the essential characteristics of employee engagement, job satisfaction, burnout, organisational commitment, and turnover cognitions. Matta et al. (2015) have provided similar evidence that LMX relationship between a supervisor and subordinates influences the attitudes of employees, the job performance of employees and an employer's ability to retain these employees.

6.3.3 Hypothesis three (a)

- **Null hypothesis one ($H3a_0$):** - No significant relationship exists between cognitive work engagement and project success.
- **Alternate Null hypothesis one ($H3a_1$):** - A significant relationship exists between cognitive work engagement and project success.

Based on the results, the null hypothesis was rejected, and the alternate hypothesis accepted. From the results, the researcher concluded that cognitive work engagement has an impact on project success. Hypothesis three (a) was formulated to answer research objective two which looked at the relationship between cognitive work engagement and project success. The linear regression analysis indicated that a significant relationship does exist between cognitive work engagement and project success. The results are displayed in figure 15 below.

6.3.4 Hypothesis three (b)

- **Null hypothesis one ($H3b_0$):** - No significant relationship exists between emotional work engagement and project success.

- **Alternate Null hypothesis one ($H3b_1$):** - A significant relationship exists between emotional work engagement and project success.

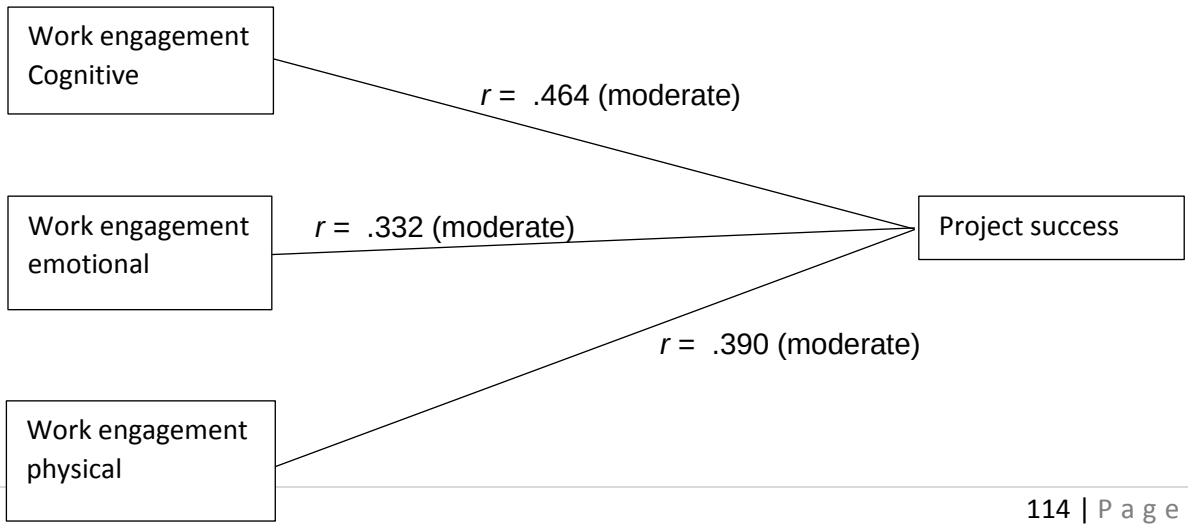
Based on the results, the null hypothesis was accepted, and the alternate hypothesis rejected. From the results, the researcher concluded that emotional work engagement correlates with project success but that this relationship is not significant. Hypothesis three (b) was formulated to answer research objective two which looked at the relationship between emotional work engagement and project success. The results are displayed in figure 15 below.

6.3.5 Hypothesis three (c)

- **Null hypothesis one ($H3c_0$):** - No significant relationship exists between physical work engagement and project success.
- **Alternate Null hypothesis one ($H3c_1$):** - A significant relationship exists between physical work engagement and project success.

Based on the results, the null hypothesis was accepted, and the alternate hypothesis rejected. From the results, the researcher concluded that physical work engagement correlates with project success but that this relationship is not significant. Hypothesis three (c) was formulated to answer research objective two which looked at the relationship between physical work engagement and project success. The results are displayed in figure 15 below.

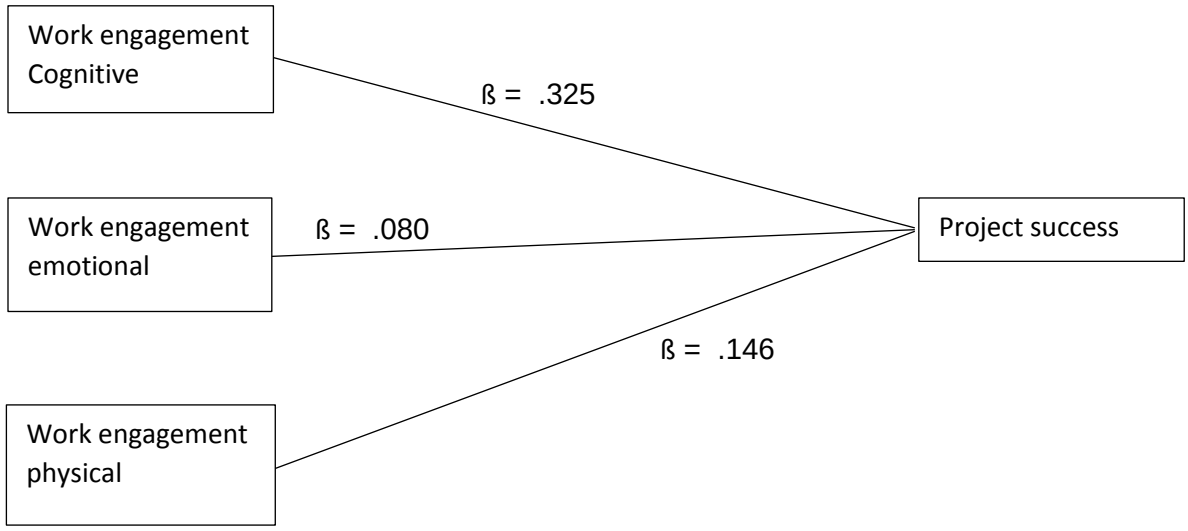
Figure 15: Association between the work engagement subscales and project success



6.3.6 Hypothesis three conclusion

The results also indicate that cognitive work engagement is the biggest predicter of project success. The results are presented in figure 16 below. These results show that when a project manager is cognitively engaged in his/her work that the project success would me more probable. Similar to the results above work was done by Haffer and Haffer (2016) found that people and their work engagement levels are critical to successful project outcomes. They concluded that higher levels of work engagement increase the probability of project success.

Figure 16: Project success predictors



6.3.7 Hypothesis four (a)

- **Null hypothesis four ($H4a_0$):** - No significant relationship exists between cognitive work engagement and turnover intention.

- **Alternate Null hypothesis four ($H4a_1$):** - A significant relationship exists between cognitive work engagement and turnover intention.

Based on the results, the null hypothesis was accepted, and the alternate hypothesis rejected. From the results, the researcher concluded that cognitive work engagement correlates with turnover intention but that this relationship is not significant. Hypothesis four (a) was formulated to answer research objective two which looked at the relationship between cognitive work engagement and turnover intentions. The results are displayed in figure 17 below.

6.3.8 Hypothesis four (b)

- **Null hypothesis four ($H4b_0$):** - No significant relationship exists between emotional work engagement and turnover intention.

- **Alternate Null hypothesis four ($H4b_1$):** - A significant relationship exists between emotional work engagement and turnover intention.

Based on the results, the null hypothesis was rejected, and the alternate hypothesis accepted. From the results, the researcher concluded that emotional work engagement has an impact on turnover intentions. Hypothesis three (a) was formulated to answer research objective two which looked at the relationship between emotional work engagement and turnover intentions. The linear regression analysis indicated that a significant relationship does exist between emotional work engagement emotional and turnover intentions. The results are displayed in figure 17 below.

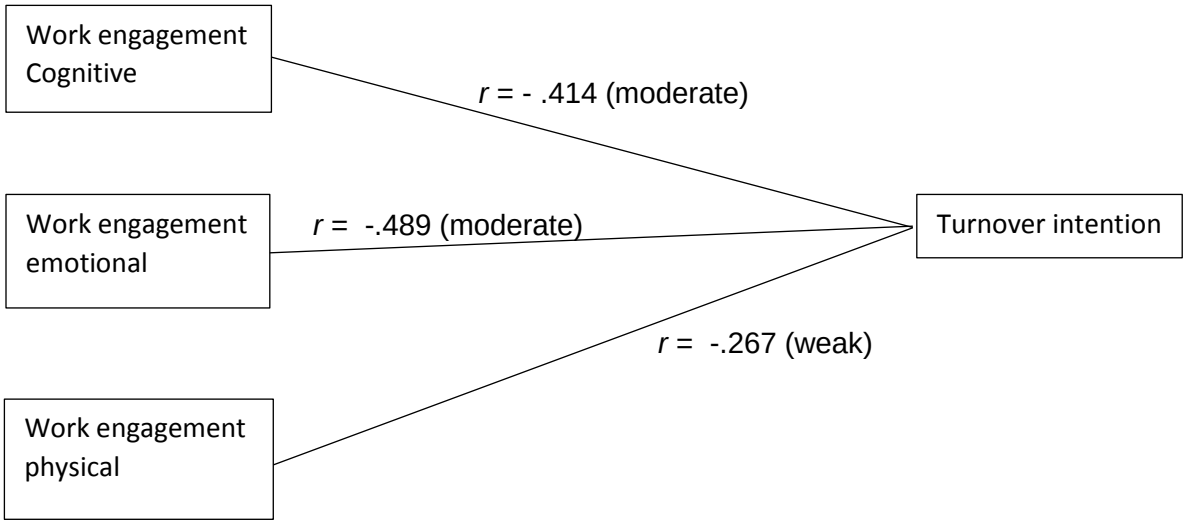
6.3.1 Hypothesis four (c)

- **Null hypothesis four ($H4c_0$):** - No significant relationship exists between physical work engagement and turnover intention.

- **Alternate Null hypothesis four ($H4c_1$):** - A significant relationship exists between physical work engagement and turnover intention.

Based on the results, the null hypothesis was accepted, and the alternate hypothesis rejected. From the results, the researcher concluded that physical work engagement correlates with turnover intention but that this relationship is not significant. Hypothesis four (c) was formulated to answer research objective two which looked at the relationship between physical work engagement and turnover intentions. The results are displayed in figure 17 below.

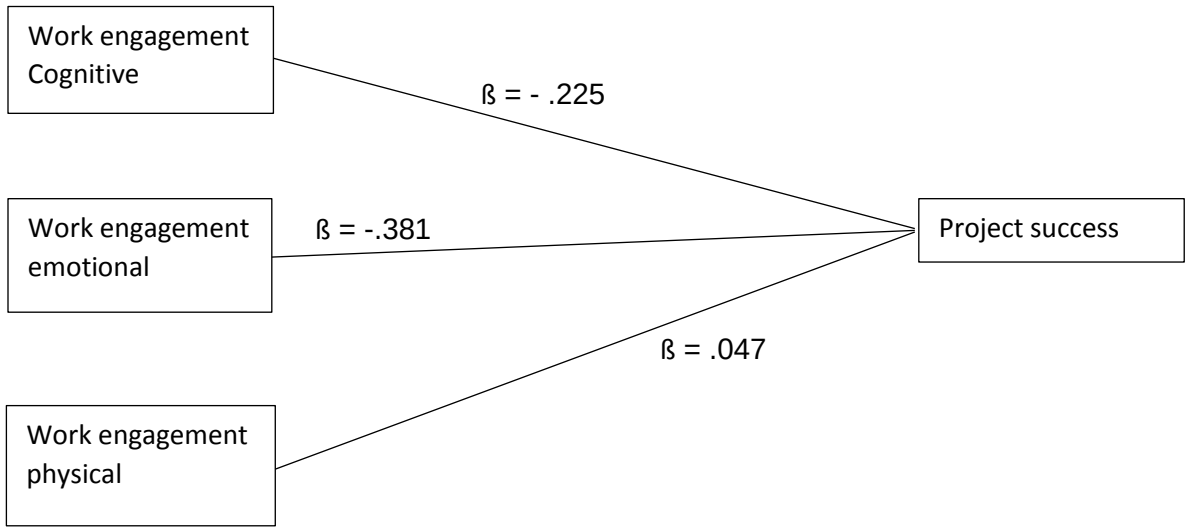
Figure 17: Association between work engagement subscales and turnover intention



6.3.2 Hypothesis four conclusion

The results presented above agrees with existing literature and findings from Fairie (2011) that there is a correlation between work engagement as a predictor and the dependent variables job satisfaction, organisational commitment and turnover intentions. Morrow et al., (2005) researched employee turnover in the construction industry, and they concluded that the construction industry is a high turnover industry. The research results indicate that it is possible for management to combat the high levels of employee turnover by firstly improving work engagement levels among employees. One initiative management can take to improve work engagement levels is to look after the emotional wellbeing of their employees as this is the biggest predictor of turnover intentions as can be seen in figure 18 below.

Figure 18: Turnover intention predictors



6.3.3 Hypothesis five

- **Null hypothesis five ($H5_0$):** - No significant relationship exists between leader-member exchange, work engagement and project success.

- **Alternate Null hypothesis five ($H5_1$):** - A significant relationship exists between leader-member exchange, work engagement and project success.

Based on the linear regression analysis where leader-member exchange and work engagement is the predictors to project success, the null hypothesis was rejected, and the alternate hypothesis accepted. From the results, the researcher concluded that leader-member exchange and work engagement are predictors to project success when they are both used simultaneously. An important finding from the results is that the relationship between work engagement and project success is significant, but the relationship between leader-member exchange is not significant. Work engagement also plays the biggest role in the prediction of project success. Hypothesis five was formulated to answer research objective three which looked at the relationship between leader-member exchange, work engagement and project success. The results are displayed in figure 19 and 20 below.

Figure 19: Association between the predictor variable leader-member exchange, work engagement and project success

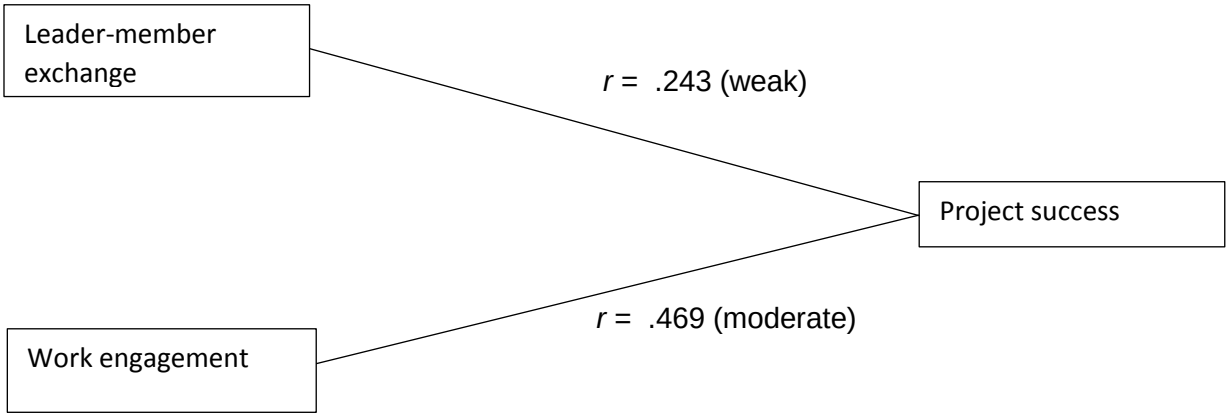
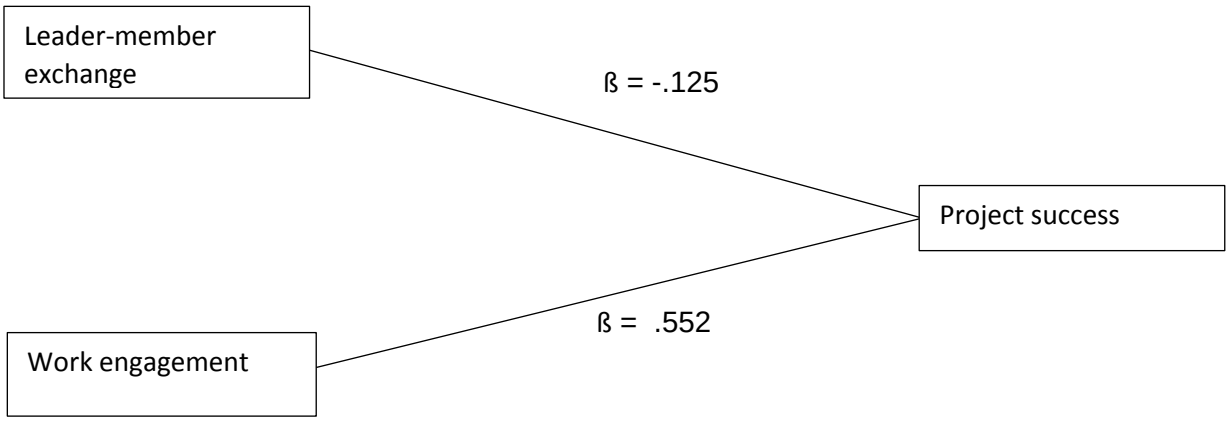


Figure 20: Project success predictors



6.3.4 Hypothesis six

- **Null hypothesis six ($H6_0$):** - No significant relationship exists between leader-member exchange, work engagement and project success.

- **Alternate Null hypothesis six ($H6_1$):** - A significant relationship exists between leader-member exchange, work engagement, and turnover intentions.

Based on the linear regression analysis where leader-member exchange and work engagement is the predictors to turnover intention, the null hypothesis was rejected, and the alternate hypothesis accepted. From the results, the researcher concluded that leader-member exchange and work engagement are predictors to turnover intentions when they are used simultaneously as predictors. An important finding from the results is that the relationship between work engagement is significant, but the relationship between leader-member exchange and turnover intentions is not significant if both leader-member exchange and work engagement is used as predictors. Work engagement also plays the biggest role in the prediction of turnover intention. Hypothesis six was formulated to answer research objective

three which looked at the relationship between leader-member exchange, work engagement and turnover intention. The results are displayed in figure 21 and 22 below.

Figure 21: Association between the predictor variables leader-member exchange, work engagement and turnover intention

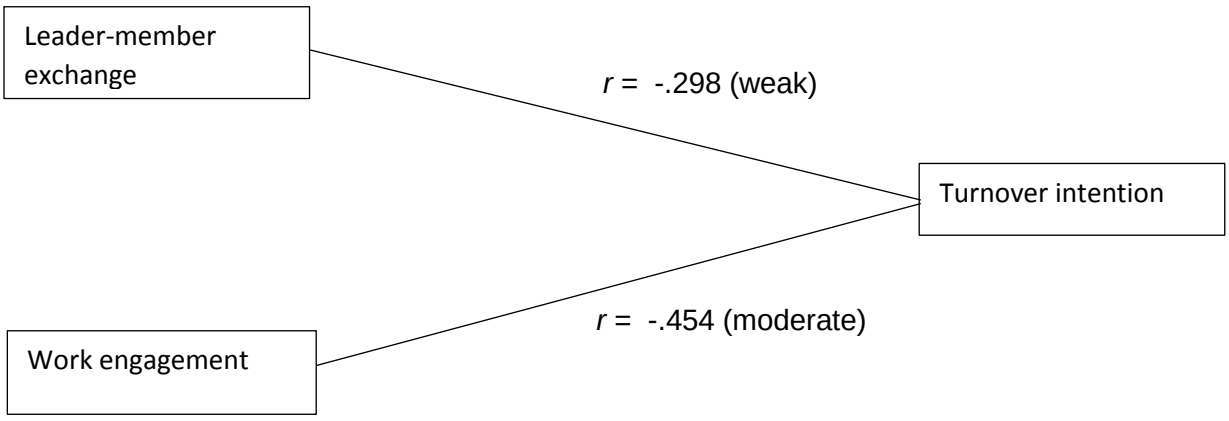
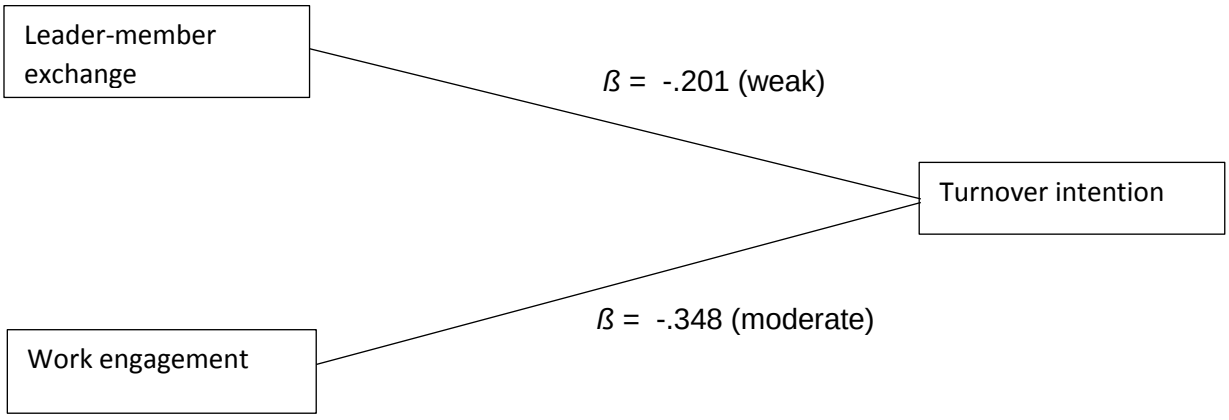


Figure 22: Turnover intention predictors



6.4 Research Objectives

The research study had three distinct objectives.

1. The study aimed to gain an understanding of the relationships that exist between the independent variable Leader-Member Exchange, and the depended variables project success and turnover intention.
2. To gain an understanding of the relationships between the three work engagement subscales (cognitive work engagement, emotional work engagement and physical work engagement) and the dependent variables project success and turnover intention.
3. To gain an understanding of the relationship where leader-member exchange and work engagement is the predictors to project success and turnover intentions.

6.5 RESEARCH OBJECTIVE ONE

6.5.1 Leader-Member Exchange and Project Success.

Objective 1: The research objective is confirmed as there is a significant positive relationship between leader-member exchange (predictor) and project success (dependent variable). Therefore, good quality LMX leads to an increased probability of project success.

6.5.2 Results from the data analysis

Objective 1- a	Conclusion : Regression coefficient & Variance
Hypothesis 1: accept the alternate - $H1_1$	• There exists a significant positive linear relationship between LMX and PS • The model is significant • In the association of LMX and PS, LMX account for 59 % of the variance in the PS. • The model predicts that for a 1-point increase in LMX that PS will increase by 0.118 holding all other independent variables constant. • Therefore, LMX does significantly predict PS

6.5.3 Leader-Member Exchange and Turnover Intention.

Objective 1: The research objective is confirmed as there is a significant positive relationship between leader-member exchange (predictor) and turnover intention (dependent variable). Therefore, good quality LMX leads to a decreased probability of turnover intention.

6.5.4 Results from the data analysis

Objective 1 - b	Conclusion : Regression coefficient & Variance
Hypothesis 2: accept the alternate - $H2_1$	• There exists a significant positive linear relationship between LMX and TI • The model is significant • In the association of LMX and TI, LMX account for 18.7 % of the variance in the TI. • The model predicts that for a 1-point increase in LMX that PS will decrease by 0.642 holding all other independent • Therefore, LMX does significantly predict TI

6.6 RESEARCH OBJECTIVE TWO

6.6.1 Work engagement subscales and project success.

Objective 2: The research objective is confirmed as there is a significant positive relationship between the work engagement subscales collectively (predictors) and project success (dependent variable). Therefore, increased level of work engagement leads to an increased probability of project success.

6.6.2 Results from the data analysis

Objective 2 a	Conclusion : Regression coefficient & Variance
Hypothesis 3: accept the alternate - H3 (a,b,c)	• There exists a significant positive linear relationship between WE (subscales) and PS • The model is significant • In the association of WE (subscales) and PS, WE (subscales) account for 23.4 % of the variance in the PS. • Only WEC is significant therefore model predicts that for a 1-point increase in WEC that PS will increase by 0.326 holding all other independent variables constant. • Therefore, WE do significantly predict PS

6.6.3 Work engagement subscales and turnover intention.

Objective 2: The research objective is confirmed as there is a significant positive relationship between the work engagement subscales collectively (predictors) and turnover intention (dependent variable). Therefore, increased level of work engagement leads to a decreased probability of turnover intention.

6.6.4 Results from the data analysis

Objective 2 b	Conclusion : Regression coefficient & Variance
Hypothesis 4: accept the alternate - $H4_1$	• There exists a significant positive linear relationship between WE and TI • The model is significant • In the association of WE (subscales) and TI, WE (subscales) account for 26.7 % of the variance in the TI. • The model predicts that for a 1-point increase in WEE that TI will decrease by 1.087 holding all other independent variables constant. • Therefore, WE do significantly predict TI

6.6.5 Leader-member exchange, work engagement and project success.

Objective 3: The research objective is confirmed as there is a significant positive relationship between the leader-member exchange, work engagement and project success (dependent variable). Therefore, increased level of leader member exchange and work engagement leads to increased probability of project success.

6.7 RESEARCH OBJECTIVE THREE

6.7.1 Results from the data analysis

Objective 3 a	Conclusion : Regression coefficient & Variance
Hypothesis 5: accept the alternate - $H5_1$	• There exists a significant positive linear relationship between LMX, WE and PS • The model is significant • In the association of LMX, WE and PS, LMX and WE account for 22.8 % of the variance in the PS. • The model predicts that for a 1-point increase in WE that PS will increase by 0.235 holding all other independent variables constant. • The model predicts that for a 1-point increase in LMX that PS will decrease by 0.61 holding all other independent variables constant. • Therefore, the combined effect of LMX and WE result in a positive effect in PS

6.7.2 Leader-member exchange, work engagement and turnover intention.

Objective 3: The research objective is confirmed as there is a significant relationship between the leader-member exchange, work engagement and turnover intention (dependent variable). Therefore, increased level of leader member exchange and work engagement leads to a decreased probability of turnover intention.

6.7.3 Results from the data analysis

Objective 3 b	Conclusion : Regression coefficient & Variance
Hypothesis 6: accept the alternate - $H6_1$	• There exists a significant positive linear relationship between LMX, WE and TI • The model is significant • In the association of LMX, WE and TI, LMX and WE account for 25.4 % of the variance in the TI. • The model predicts that for a 1-point increase in LMX that TI will decrease by 0.298 holding all other independent variables constant. • The model predicts that for a 1-point increase in WE that TI will decrease by 0.454 holding all other independent variables constant. • Therefore, the combined effect of LMX and WE result in a positive effect in TI.

6.7.3.1 Comparison with existing literature.

The findings of the study indicate that good quality leader-member exchange foster higher levels of work engagement under employees. These findings support the conclusion that chances of project success will increase the higher the level of work engagement is. Matta et al., (2015) indicated that high-quality leader-member exchange relationship between leaders and subordinates lead to higher engagements of employees which can convert into greater chances for organisational citizenship behaviour resulting in the greater probability of organisational success. Turn over intention, on the other hand, will reduce if management can foster higher levels of work engagement among employees. Probably the most important findings of the study are that work engagement does have a mediating effect in the relationship between leader-member exchange and project success as well as between leader-member exchange and turn over intention. Christian et al., (2011) has through meta-analytic research established that a positive correlation is present between leader-member exchange quality and work engagement and Breevaart et al. (2015) determined that the relationship between LMX and an employee's performance at work is mediated by the work engagement.

Chrupala-Pniak et al. (2017) concluded from their study that trust does affect the work engagement of employees and as trust is a key building block for good quality leader-member exchange relationships. The findings of the study and the exiting literature do support the case that it is important to foster work engagement levels through relationships with management.

7 CHAPTER 7: CONCLUSION & RECOMMENDATIONS

The research document set out to investigate the linkages between leader-member exchange, project success, turnover intention and work engagement with a focus on project managers who are active in the construction industry. This chapter concludes the research findings and highlights the implication for management of project managers and theory. Finally, the chapter highlights the limitations of the research, and suggestion is made for future research.

7.1 RESEARCH OBJECTIVE ONE

The first objective was to determine whether a relationship exists between LMX and project success and if a relationship exists between LMX and turnover intention. After conducting an SEM and linear regression analysis, it was found that a significant positive correlation exists between the constructs. The findings of this objective are consistent with the findings in existing literature (Taneja et al. 2015; Zafar, Tabish, & Jha, 2012). Taneja et al. (2015) indicated that positive relationships between management and employees increase the chances of successful project and organisational outcomes.

The second part of the first objective was to determine whether a relationship exists between LMX and turnover intention of construction project managers. After conducting an SEM and linear regression analysis, it was found that a significant negative correlation exists between the constructs. The findings of this objective are consistent with the findings in existing literature (Hertzberg 1968; Matta et al., 2015; Morrow et al. 2005) and aligns with the research findings of Covella et al., (2017) who indicates that managerial behaviours, attitudes and actions have a significant impact on the turnover intentions of employees.

The loss of staff has a negative impact on business due to the high cost involved with staff turnover and staff turnover also impacts on the morale of remaining employees, it results in the loss of organisational memory, it leads to lower productivity, and it affects the chances for project success (Henson, 2015; Du Plooy & Roodt, 2010).

7.2 RESEARCH OBJECTIVE TWO

The second objective was to determine whether a relationship exists between work engagement, specifically the three subscales cognitive work engagement, emotional work engagement and physical work engagement and project success. “Work engagement forms part of the larger sphere of Employee Engagement. Employee work engagement is “achieved through the behavioural investment of physical, cognitive, and emotional energy in work roles”(Agarwal et al., 2012).

After conducting an SEM and linear regression analysis, it was found that a significant positive correlation exists between cognitive work engagement and project success. The research findings do indicate that correlation exists between emotional work engagement, physical work engagement and project success, but these relationships are however non-significant. The overall results of the higher-level construct of work engagement do indicate that a significant positive relationship does exist with project success. The findings of this objective are consistent with the findings in existing literature (Macey et al., 2012; Schaufeli et al.2002). Loufrani-Fedidia & Missonier (2015) states that the project manager is at the centre of projects, project success and organisational success, therefore, their engagement in their work is of critical importance.

The second part objective was to determine whether a relationship exists between the three work engagement subscales and turnover intention of construction project managers. After conducting an SEM and linear regression analysis, it was found that a significant negative correlation exists between emotional work engagement and turnover intentions. The research findings do indicate that correlation exists between cognitive work engagement, physical work engagement and turnover intentions, but these relationships are however non-significant. The overall results of the higher-level construct of work engagement do indicate that a significant negative relationship does exist with turnover intentions. The findings of this objective are consistent with the findings in existing literature (Rezvani et al., 2016). Taneja et al.,(2015) formed the view that organisations can improve their competitive advantage by having an effective and efficient employee engagement strategy and through this limit the turnover of employees increasing the likelihood of existing in the future. Both Saks (2006) and Halbesleben (2010) conducted research that found strong negative correlations between the engagement of employees and their turnover intentions. Du Plooy & Roodt (2010) was able to identify that the burnout continuum is a predictor of turnover intention.

7.3 RESEARCH OBJECTIVE THREE

The third objective aimed to determine whether linkages exist between leader-member, work engagement and project success. The results of the SEM and linear regression analysis indicated that relationships do exist between leader-member exchange, work engagement and project success. Firstly, the results of SEM indicates that work engagement does act as a mediator in the relationship between leader-member exchange and project success. The results show that work engagement partially mediates the relationships resulting in increased probability for project success outcomes. In the SEM leader-member exchange and project success have a negative relationship, but as soon as work engagement is introduced into the relationship model, the relationship becomes positive. The results of the linear regression show that on its own leader-member exchange is not a significant predictor of project success on its own although correlation exists. The linear regression does identify a significant positive relationship between work engagement and project success, and as soon as leader-member exchange and work engagement are used simultaneously as predictors for project success, the relationship is a positive linear relationship. The findings of this objective are consistent with the findings in existing literature

The second part of the third objective was to determine whether linkages exist between leader-member exchange, work engagement and turnover intention. The results of the SEM and linear regression analysis indicated that relationships do exist between leader-member exchange, work engagement and turnover intention. Firstly, the results of SEM indicate that work engagement does act as a mediator in the relationship between leader-member exchange and turnover intention. Work engagement partially mediates the relationship resulting decrease in turnover intentions amongst construction project managers. In the SEM leader-member exchange and turnover intention have a moderate negative relationship, but as soon as work engagement is introduced into the relationship, the relationship changes through work engagement resulting in decreased turnover intention. The results indicate that if work engagement is fostered with project managers that the turnover intention of construction project manager decreases. The results of the linear regression indicate that on its own leader-member exchange is not a significant predictor of turnover intentions although correlation exists. The linear regression does identify a significant positive relationship between work engagement and turnover intentions and as soon as leader-member exchange and work engagement are used simultaneously as predictors for turnover intention the relationship is a positive linear relationship.

7.4 IMPLICATIONS FOR THEORY

The results of the study provide insight into the linkages that exist between leader-member exchange, work engagement, project success and turnover intention among construction project managers. Work engagement is identified as a predictor for both project success and turnover intention, and work engagement is also identified as a mediator in the relationships between leader-member exchange and project success and between leader-member exchange and turn over intentions. The study provides a theoretical model that can be used to investigate the relationship between the different constructs. The findings of the study contribute to the popular employee engagement sphere of research as well as the relationship theory research field.

7.5 IMPLICATIONS FOR MANAGEMENT AND BUSINESS

The insight gained from the research can assist management of businesses to top better under employees and to cultivate the aspect that leads to project success and reduce the turnover intention of employees among employees. Greater insight is provided into the work engagement of construction project manager and the aspect onto which the work engagement does have an impact.

Most social exchange literature focusses on the construct of organisational environments and not in a project environment. The findings of the study contribute to the expansion of project success literature. The study focused on the interrelationship between managers and project managers whereas most studies in the project success field focusses on human resource factors.

The role of project managers is becoming ever more important. These highly skilled individuals are key to the outcomes of projects and play an essential role in ensuring the success of future organisational operations(Albert, Balve, & Spang, 2017b). The study results indicate that the relationship between project managers and their managers are important relationship but that it vital for management needed to foster work engagement as this can result in project success outcomes and decreased turn over intentions. Literature indicates the importance of successful projects to the sustainability of an organisation (Albert, Balve, & Spang, 2017; Shenhar et al., 2010; Todorović et al., 2015).

Forming a greater understanding of the relationship between management and employees are essential as this will allow management to make a more informed decision in the future. The study proves that it is important for management to have a very good understanding of how to foster work engagement under their employees as this can result in greater project outcomes and a reduction in turnover intentions.

An interesting and unexpected finding of the study is that leader-member exchange and project success has a negative relationship and that this relationship is not significant. Only once work engagement is introduced into the fold can the true impact of good quality leader-member exchange relationships be seen. The thesis narrows down the field of things managers need to look at when they want to ensure that they maintain talented and skilled resources. Management needs to specifically foster emotional work engagement with employees if they want to reduce turnover intentions. An unexpected result is that physical work engagement plays a very small role in the turnover intention of project managers and that it is their cognitive and emotional wellbeing that drive their intention to turnover. To improve the changes of project success, management needs to focus on the cognitive work engagement of construction project managers.

These results are especially important in the South Africa economy where there are extensive challenges regarding skills mismatch. The ability of firms to keep talented employees engaged to minimise turnover and to deliver successful projects is essential to the sustainability of companies. Improving leader-member exchange and work engagement can also possibly lead to other improved employee behaviours such as improved job performance and organisational citizenship behaviours.

Managers are also better informed as to what leadership styles to possibly use at work when engaging with employees. Some employees might prefer a transactional relationship with their managers where other might prefer a socio-emotional relationship.

7.6 LIMITATIONS OF RESEARCH

7.6.1 The Research Topic

The researcher topic only focussed on one the part of the larger leadership sphere namely leader-member exchange and it was limited in its focus on the work engagement of employees not taking into consideration the other types of engagement that may exist under employee engagement sphere. The research is flawed by implicitly assuming that the quality of the relationship can be measured from one side of the leader-member exchange relationship. The researcher only suggested work engagement as a mediating path in the study and acknowledges that other mediating pathways or construct may also exist which was not tested in this study.

7.6.2 The Design of the research and the data

- The research was limited to the South African construction industry and the study purely focussed on construction project manager who is active in the construction industry. Therefore the outcomes of the study are limited in its applicability to other industries and the broader international context.
- The study had a cross-sectional design which means that it provides a snapshot of a specific point in time and this does not allow for the analysis of trends over time as it only focusses on the current context.
- A six-point Likert scale was used in the survey to collect the data and although there is nothing wrong with this is principal five points, or a seven Likert scale might have been better suited to the study.
- Most of the population who completed the survey is from the male gender, and the results of the study might have been different if a greater number of females had completed the study.
- The limitations of the chosen distribution method are that internet-based surveys are susceptible to being filtered as spam. Making use of survey distribution platforms can also result in surveys being corrupted or not being delivered to its designated recipients.

- The research study focussed only on project managers and excluded other functional managers who could also have an impact on project success or the turnover intentions of employees.
- The research study was quantitative in nature, and therefore respondents are not able to explain the context of their answers.

7.7 FUTURE RESEARCH

The study focussed on project managers active if the construction industry. It would be interesting to see if the study yields the same result in other industries. The study was also limited to the context of South Africa, and the opportunity exists to duplicate the study in the rest of the world.

Other opportunities are to have the study focus on a single gender either male or female. It will be interesting to see if males and females respond differently to leader-member exchange relationships and work engagement and could provide management with insight into how the management of different genders can be approached.

The model can be reconstructed to reflect the constructs in other sequences or new constructs can be introduced into the model to see the impact this has on the individual constructs.

7.8 CONCLUDING STATEMENT

The importance of work engagement cannot be underestimated, and management who are concerned with the sustainability of a business should be keeping a close eye on this. Management should not underestimate the vital roles they play in the work engagement of their subordinates and should endeavour to form a very good understanding of their relationships they form with their employees.

The purpose of the research was to understand if the relationship between a manager and a construction project manager has an impact on the project success outcomes of a project and

if this relationship has an effect the turnover intentions of the construction project manager. The study also explored the effect of work engagement on the project success outcomes and the turnover intention of construction project managers. The study results identify linkages between the variables and allow for a better understanding of these variables.

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APPENDIX 1: MEASUREMENT INSTRUMENT

Please complete the questionnaire below by ticking below/next to the applicable block

	Yes	**No**
I work as a project manager in the construction industry		

1. Age	
20-29	
30-39	
40-49	
50-59	
60-69	
70 and up	
2. Gender	
Female	
Male	
3. Tenure at Organisation	
0-5 Years	
6-10 Years	
11 - 15 Years	
15-20 Years	
21-25 Years	
26 or more Years	

Please choose the most applicable rating to you on a scale of 1 to 6, where **1= Strongly disagree, 2 = Disagree, 3= Disagree somewhat, 4= Agree somewhat, 5 = Agree and 6 = Strongly agrees** with the statements below.						
1 - Strongly Disagree; 2 - Disagree; 3 - Slightly Disagree; 4 -Slightly Agree; 5 - Agree; 6 - Strongly Agree						
Table 1: Measuring LMX						
Measuring Leader-member Exchange						
Scale	Strongly Disagree	Disagree	Slightly Disagree	Slightly Agree	Agree	Strongly Agree
	1	2	3	4	5	6
(Henson,Heischmidt, & Mardanov, 2015).						
I admire my supervisor's professional skills	1	2	3	4	5	6
My supervisor is a lot of fun to work with	1	2	3	4	5	6
I do not mind working my hardest for my supervisor	1	2	3	4	5	6
I do not do work for my supervisor that goes beyond what is specified in my job descriptions	1	2	3	4	5	6
My supervisor defends my work actions to a superior, even without complete knowledge of the issue in question	1	2	3	4	5	6
My supervisor is the kind of person who I would like to have as a friend	1	2	3	4	5	6

My supervisor would come to my defence if I were "attacked" by others	1	2	3	4	5	6
My supervisor would defend me from others in the organisation if I made an honest mistake	1	2	3	4	5	6
I respect my supervisor's knowledge and competence on the job.	1	2	3	4	5	6

Table 2: Job Engagement Scale						
Measuring Engagement						
Scale	Strongly Disagree	Disagree	Slightly Disagree	Slightly Agree	Agree	Strongly Agree
	1	2	3	4	5	6
(Rich et al.,2010)						
Physical						
I work with intensity on my job	1	2	3	4	5	6
I exert my full effort to my job	1	2	3	4	5	6
I devote a lot of energy to my job	1	2	3	4	5	6
I try my hardest to perform well on my job	1	2	3	4	5	6
I strive as hard as I can to complete my job.						
I exert a lot of energy on my job	1	2	3	4	5	6
Emotional						
I am enthusiastic about my job	1	2	3	4	5	6
I feel energetic about my job	1	2	3	4	5	6
I am interested in my Job	1	2	3	4	5	6

I am proud of my job	1	2	3	4	5	6
I feel positive about my job	1	2	3	4	5	6
I am excited about my job	1	2	3	4	5	6
Cognitive						
At work, my mind is focussed on my job						
At work, I pay a lot of attention to my job						
At work, I focus a great deal of attention on my job.						
At work, I concentrate on my job						
At work, I devote a lot of attention to my job						

Table 3: Project Success Scale						
Measuring Project Success						
Scale	Strongly Disagree	Disagree	Slightly Disagree	Slightly Agree	Agree	Strongly Agree
	1	2	3	4	5	6
(Maqbool, Sudong, Manzoor, & Rashid, 2017)						
I completed my projects on time as scheduled	1	2	3	4	5	6
I completed my projects within the allocated budget	1	2	3	4	5	6
In the project, I met the quality needs and requirement of the customers	1	2	3	4	5	6
I was able to achieve the satisfaction of my team members with overall project management and performance	1	2	3	4	5	6
I was able to achieve end users' satisfaction with the project outcome/deliverables	1	2	3	4	5	6
I was able to ensure satisfaction of suppliers involved in the project	1	2	3	4	5	6
I was able to achieve the project's purpose	1	2	3	4	5	6
I am confident that my projects have achieved their self -defined criteria of success	1	2	3	4	5	6

Table 4: Intention to Turnover Scale						
Intention to Turnover						
Scale	Strongly Disagree	Disagree	Slightly Disagree	Slightly Agree	Agree	Strongly Agree
	1	2	3	4	5	6
(Neira-fontela & Castro-casal, 2014)						
How likely is it that you will be working at the same company this time next year?	1	2	3	4	5	6
How likely is that you will take steps during the next year to secure a job at a different company	**1**	2	3	4	5	6
I will probably look for a job at a different company in the next year	1	2	3	4	5	6

APPENDIX 2: APPROVAL FROM SACPCMP TO DISTRIBUTE THE SURVEY

SACPCMP
The South African Council for the Project and Construction Management Professions
— CONSTRUCTING NEW PERSPECTIVES —

09 June 2018

Attention: Gordon Institute of Business Science
E-mail: admissions@gibs.co.za; info@gibs.co.za
Cc: Mr Derik Ritchie: derikritchie@gmail.com

Re: To whom it may concern

Dear Sir/Madam

RE: APPROVAL OF SURVEY DISTRIBUTION
SUBJECT: LINKING LEADER-MEMBER EXCHANGE, WORK ENGAGEMENT, PROJECT SUCCESS AND TURNOVER INTENTIONS OF CONSTRUCTION PROJECT MANAGERS.

1. The candidate is hereby granted approval to conduct a study through the distribution of questionnaires in the SACPMP Community towards completition of his Master's Degree in Business Administration (MBA) with the Gordon Institute of Business Science (GIBS). Permission is given to the candidate to distribute questionnaires between June and August 2018.

2. As per documents submitted to us, the title of his study is "Linking Leader-Member Exchange, Work Engagement, Project Success and Turnover intentions of construction project managers."

3. In coming of the decision to grant permission, Executive Management evaluated the following documents:

3.1. A research proposal dated 7 May 2018;
3.2. Proof of registration showing that the candidate is a student at GIBS; and
3.3. The research instrument (questionnaire)

4. I, therefore, recommend that the study be approved, and the research candidate be afforded the opportunity to pursue the study. The said study to be supervised by Dr T Kele and the principal researcher is Mr D Ritchie.

Yours Sincerely

Mr Yuven Gounden
Stakeholder Relations and Communications

International Business Gateway, Cnr New and 6th Road, Gateway Creek
PO Box 1868 Halfway House, Midrand, 1685
TEL: 011 315 0422 FAX: 011 315 0455

WWW.SACPCMP.ORG.ZA

APPENDIX 3: ETHICAL CLEARANCE CONFIRMATION

Gordon
Institute
of Business
Science
University
of Pretoria

28 June 2018

Ritchie Derik

Dear Derik

Please be advised that your application for Ethical Clearance has been approved.

You are therefore allowed to continue collecting your data.

Please note that approval is granted based on the methodology and research instruments provided in the application. If there is any deviation change or addition to the research method or tools, a supplementary application for approval must be obtained

We wish you everything of the best for the rest of the project.

Kind Regards

GIBS MBA Research Ethical Clearance Committee

Gordon Institute of Business Science
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APPENDIX 4: STATISTICAL ANALYSIS RESULTS

Table 29: Frequencies

Statistics

		LMX_TOT	WEP_TOT	WEE_TOT	WEC_TOT	WE_TOT	PS_TOT	TI_TOT
N	Valid	209	209	209	209	209	209	209
	Missing	0	0	0	0	0	0	0
Mean		40.42	32.08	31.25	25.57	88.89	40.60	11.03
Median		41.00	32.00	32.00	25.00	90.00	40.00	11.00
Std. Deviation		8.635	3.379	4.610	3.735	10.505	5.050	2.764
Variance		74.561	11.417	21.255	13.948	110.364	25.500	7.638
Skewness		-.964	-.523	-1.006	-.523	-.674	-.656	.085
Std. Error of Skewness		.168	.168	.168	.168	.168	.168	.168
Kurtosis		.928	-.574	.805	-.268	-.008	.423	-.483
Std. Error of Kurtosis		.335	.335	.335	.335	.335	.335	.335

Table 30: Varimax Rotation

Rotated Component Matrix[a]

	Component					
	1	2	3	4	5	6
PS4	.828					
PS5	.821					
PS3	.802					
PS7	.775					
PS8	.766					
PS6	.754					
PS2	.709					
PS1	.688					
LMX7		.854				
LMX8		.834				
LMX2		.793				
LMX3		.779				
LMX5		.761				
LMX6		.724				
LMX9		.721				
LMX1		.647				
LMX4		.462				
WEP4			.797			
WEP6			.752			
WEP3			.747			
WEP2			.737			
WEP5			.702			
WEP1			.601			
WEE6				.829		
WEE5				.809		
WEE1				.772		
WEE3				.745		
WEE2				.745		
WEE4			.408	.687		
TI2					.889	
TI3					.887	
TI1					.760	
WEC4			.483			.611
WEC1				.430		.564
WEC5			.481			.563
WEC3			.483	.412		.560
WEC2			.479	.409		.558

Table 31: LMX & PS - Model Summary

Model Summary[b]

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	Change Statistics					Durbin-Watson
					R Square Change	F Change	df1	df2	Sig. F Change	
1	.243[a]	.059	.054	.53372	.059	12.983	1	207	.000	2.219

a. Predictors: (Constant), LMX
b. Dependent Variable: PS

Table 32: LMX & PS - Anova

ANOVA[a]

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	3.698	1	3.698	12.983	.000[b]
	Residual	58.965	207	.285		
	Total	62.664	208			

a. Dependent Variable: PS
b. Predictors: (Constant), LMX

Table 33: LMX & PS - Coefficients

Coefficients[a]

Model		Unstandardized Coefficients		Standardized Coefficients			95.0% Confidence Interval for B		Collinearity Statistics	
		B	Std. Error	Beta	t	Sig.	Lower Bound	Upper Bound	Tolerance	VIF
1	(Constant)	2.667	.172		15.493	.000	2.327	3.006		
	LMX	.118	.033	.243	3.603	.000	.053	.183	1.000	1.000

a. Dependent Variable: PS

Figure 23: LMX & PS P-P Plot

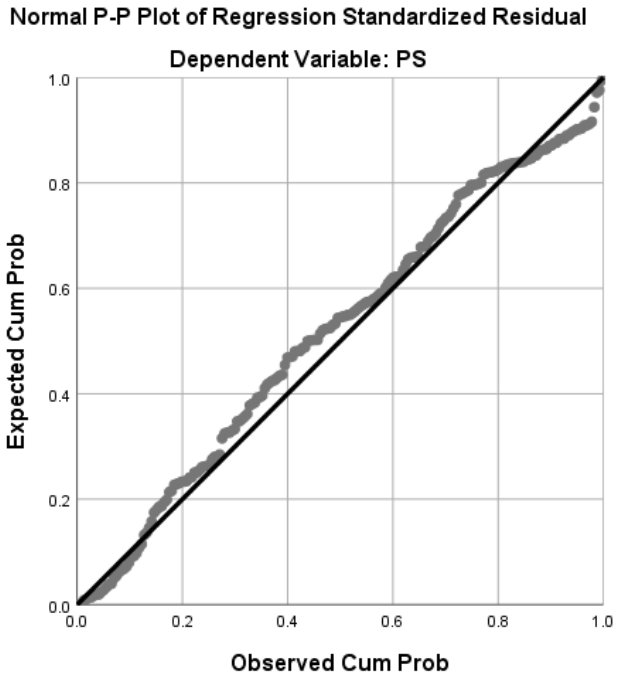

Figure 24 - LMX & PS Scatterplot

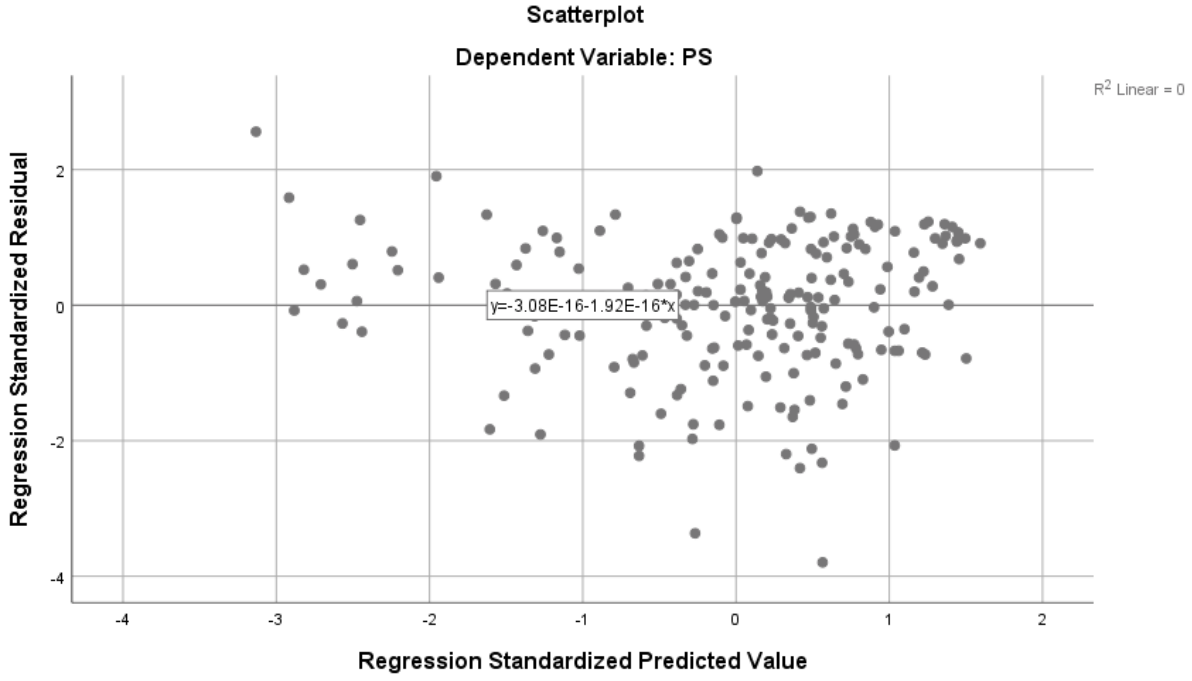

Table 34: LMX and TI Model Summary

Model Summary[b]

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	Change Statistics					Durbin-Watson
					R Square Change	F Change	df1	df2	Sig. F Change	
1	.432[a]	.187	.183	1.51635	.187	47.612	1	207	.000	1.134

a. Predictors: (Constant), LMX
b. Dependent Variable: TI

Table 35: LMX & TI - Anova

ANOVA[a]

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	109.475	1	109.475	47.612	.000[b]
	Residual	475.956	207	2.299		
	Total	585.431	208			

a. Dependent Variable: TI
b. Predictors: (Constant), LMX

Table 36: LMX & TI - Coefficients

Coefficients[a]

Model		Unstandardized Coefficients		Standardized Coefficients			95.0% Confidence Interval for B		Collinearity Statistics	
		B	Std. Error	Beta	t	Sig.	Lower Bound	Upper Bound	Tolerance	VIF
1	(Constant)	5.962	.489		12.192	.000	4.998	6.926		
	LMX	-.642	.093	-.432	-6.900	.000	-.826	-.459	1.000	1.000

a. Dependent Variable: TI

Figure 25: LMX & TI - P-P Plot

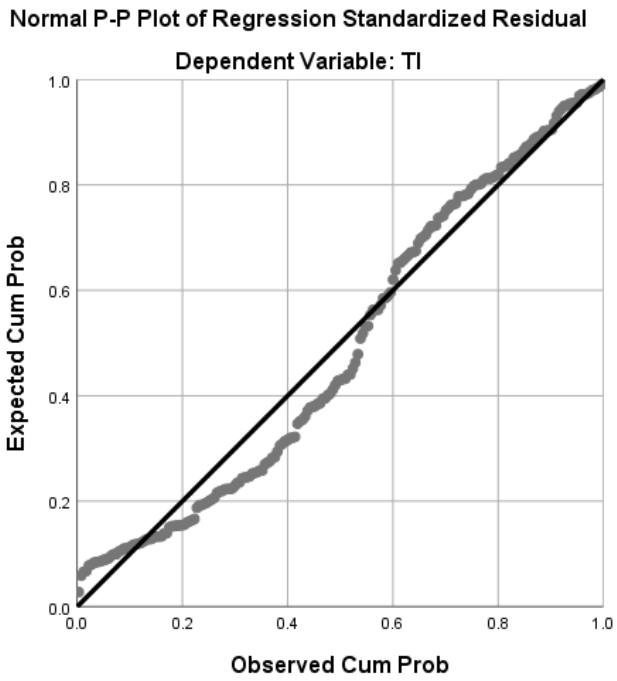

Figure 26: LMX & TI - Scatterplot

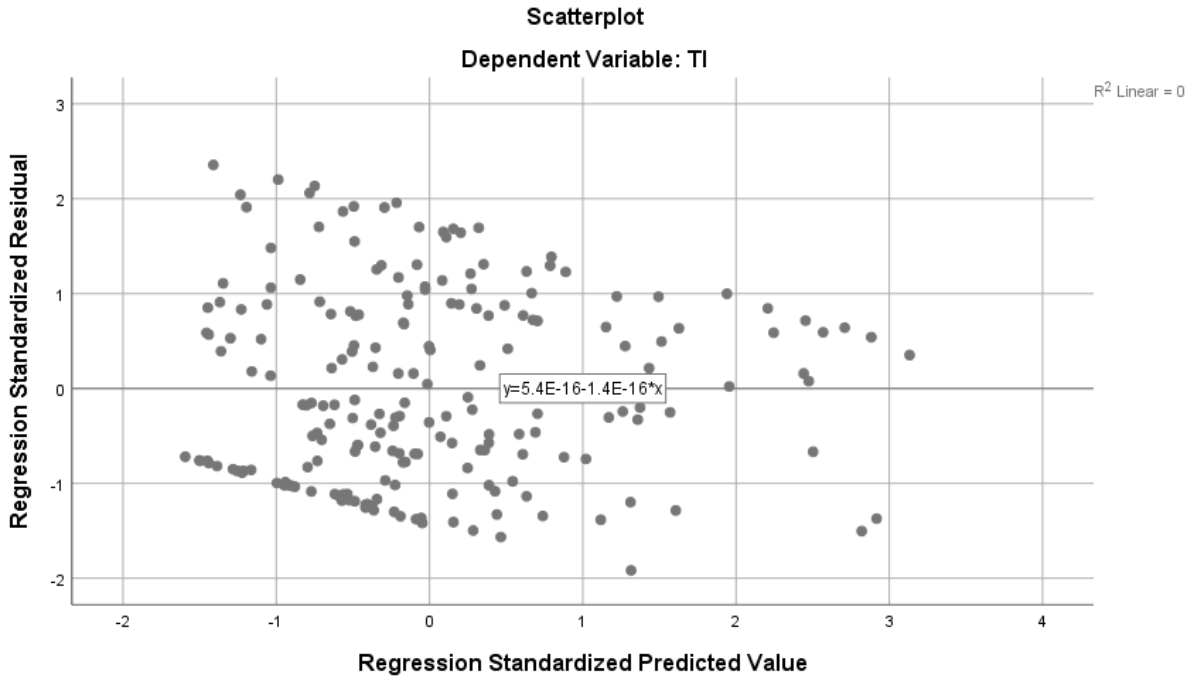

Table 37: WE & PS - Model Summary

Model Summary[b]

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	Change Statistics					Durbin-Watson
					R Square Change	F Change	df1	df2	Sig. F Change	
1	.469[a]	.220	.216	.48598	.220	58.322	1	207	.000	2.108

a. Predictors: (Constant), WE
b. Dependent Variable: PS

Table 38: WE & PS - Anova

ANOVA[a]

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	13.774	1	13.774	58.322	.000[b]
	Residual	48.889	207	.236		
	Total	62.664	208			

a. Dependent Variable: PS
b. Predictors: (Constant), WE

Table 39: WE & PS - Coefficients

Coefficients[a]

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.	95.0% Confidence Interval for B		Collinearity Statistics	
		B	Std. Error	Beta			Lower Bound	Upper Bound	Tolerance	VIF
1	(Constant)	1.814	.194		9.353	.000	1.432	2.196		
	WE	.200	.026	.469	7.637	.000	.148	.252	1.000	1.000

a. Dependent Variable: PS

Figure 27: WE & PS P-P Plot

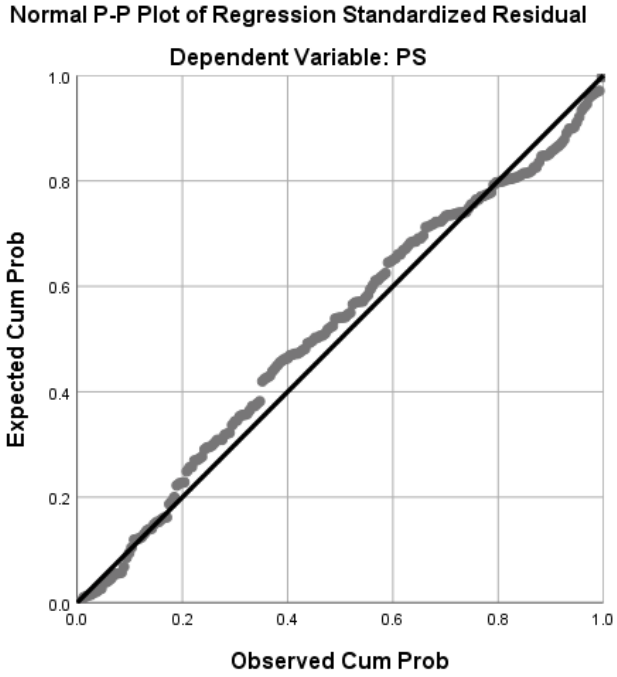

Figure 28 : WE & PS - Scatterplot

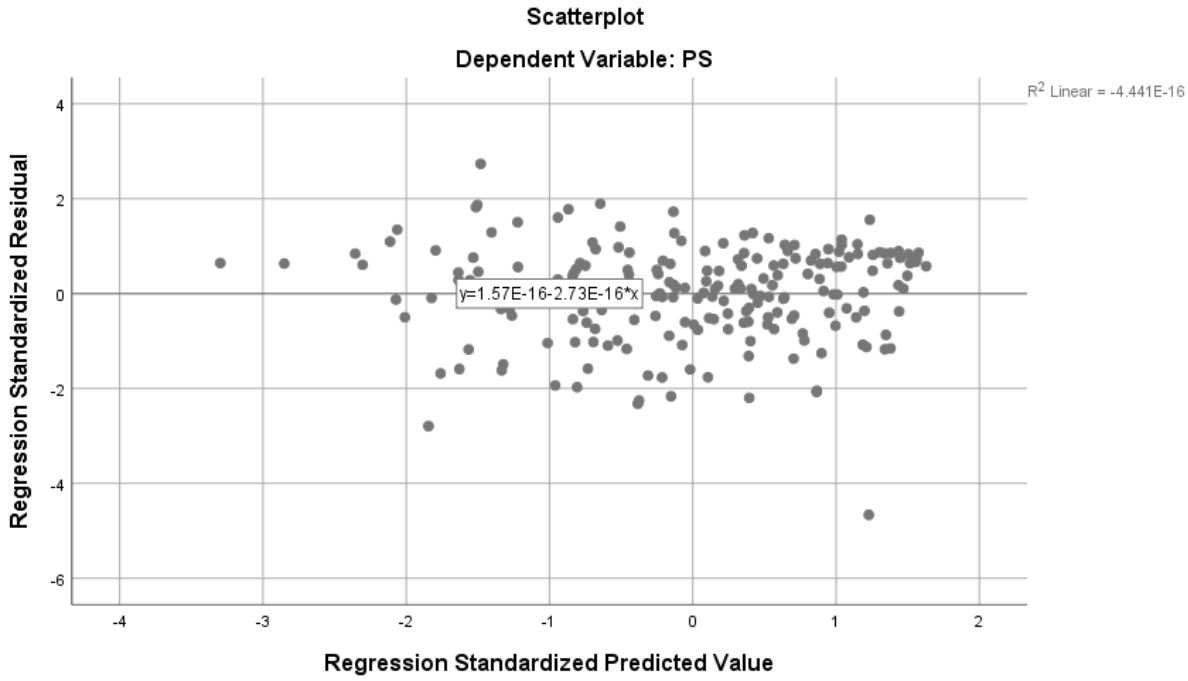

Table 40: WE & TI - Model Summary

Model Summary[b]

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	Change Statistics					Durbin-Watson
					R Square Change	F Change	df1	df2	Sig. F Change	
1	.482[a]	.232	.228	1.47381	.232	62.520	1	207	.000	1.088

a. Predictors: (Constant), WE
b. Dependent Variable: TI

Table 41: WE & TI - Anova

ANOVA[a]

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	135.802	1	135.802	62.520	.000[b]
	Residual	449.629	207	2.172		
	Total	585.431	208			

a. Dependent Variable: TI
b. Predictors: (Constant), WE

Table 42: WE & TI - Coefficients

Coefficients[a]

Model		Unstandardized Coefficients		Standardized Coefficients			95.0% Confidence Interval for B		Collinearity Statistics	
		B	Std. Error	Beta	t	Sig.	Lower Bound	Upper Bound	Tolerance	VIF
1	(Constant)	7.246	.588		12.321	.000	6.087	8.406		
	WE	-.628	.079	-.482	-7.907	.000	-.784	-.471	1.000	1.000

a. Dependent Variable: TI

Figure 29: WE & TI P-P Plot

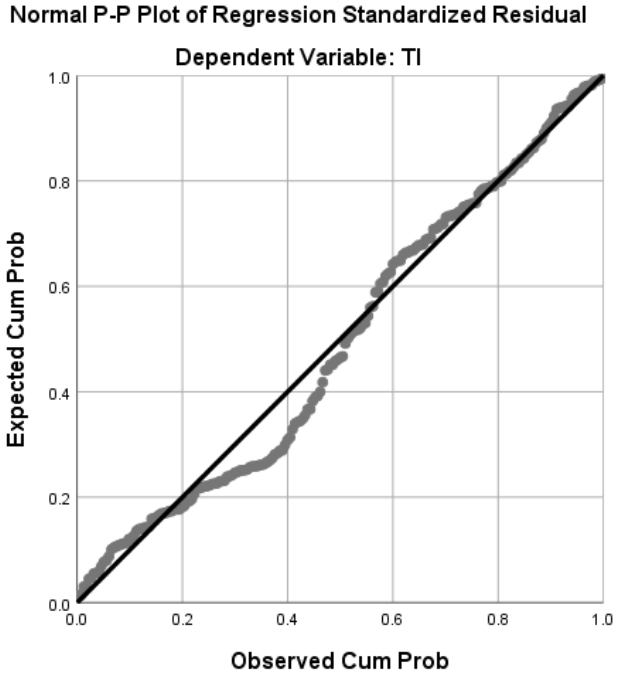

Figure 30: WE & TI Scatterplot

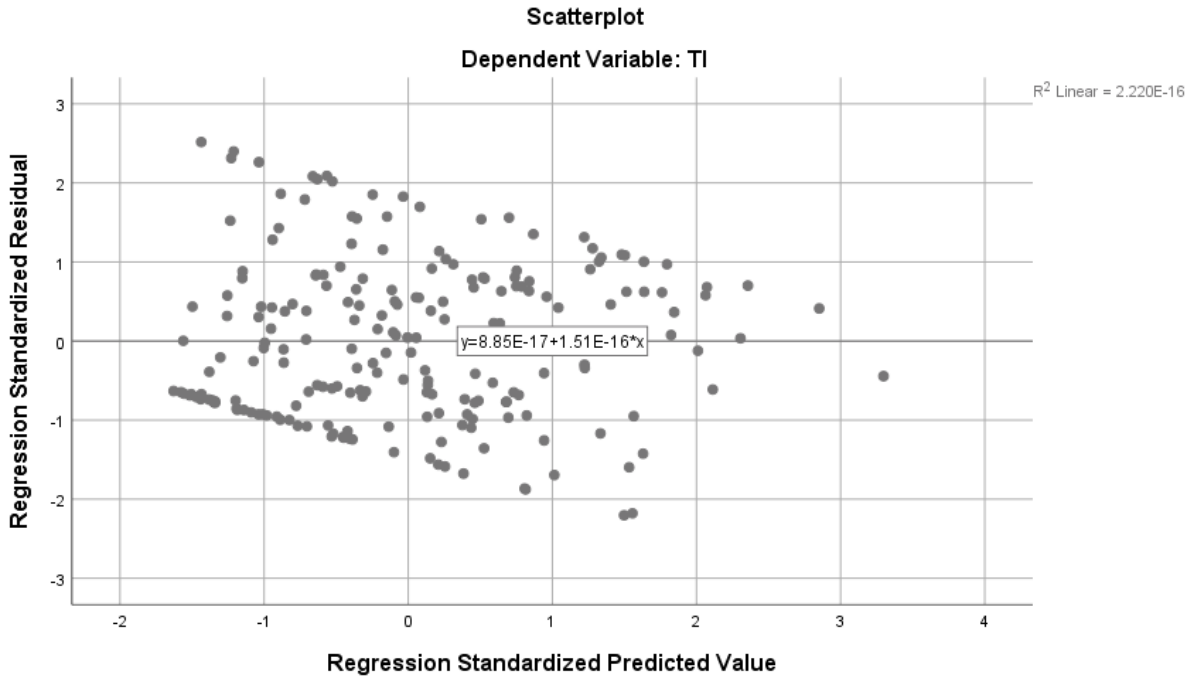

Table 43: LMX,WE & PS - Model Summary

Model Summary[b]

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	Change Statistics					Durbin-Watson
					R Square Change	F Change	df1	df2	Sig. F Change	
1	.478[a]	.228	.221	.48446	.228	30.497	2	206	.000	2.075

a. Predictors: (Constant), LMX, WE
b. Dependent Variable: PS

Table 44: LMX,WE & PS - Anova

ANOVA[a]

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	14.315	2	7.158	30.497	.000[b]
	Residual	48.348	206	.235		
	Total	62.664	208			

a. Dependent Variable: PS
b. Predictors: (Constant), LMX, WE

Table 45: LMX,WE & PS - Coefficients

Coefficients[a]

Model		Unstandardized Coefficients		Standardized Coefficients			95.0% Confidence Interval for B		Collinearity Statistics	
		B	Std. Error	Beta	t	Sig.	Lower Bound	Upper Bound	Tolerance	VIF
1	(Constant)	1.866	.196		9.503	.000	1.479	2.254		
	WE	.235	.035	.552	6.726	.000	.166	.304	.556	1.797
	LMX	-.061	.040	-.125	-1.518	.131	-.139	.018	.556	1.797

a. Dependent Variable: PS

Figure 31: LMX, WE & PS P-P Plot

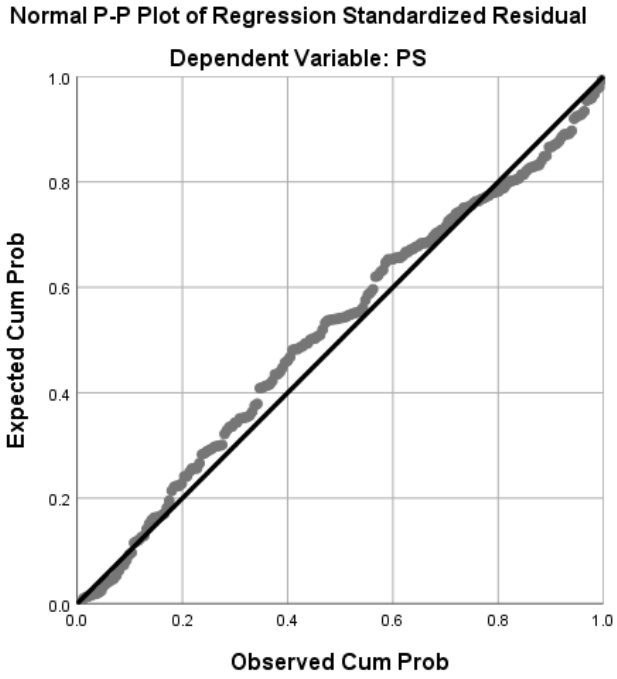

Figure 32: LMX,WE & PS Scatterplot

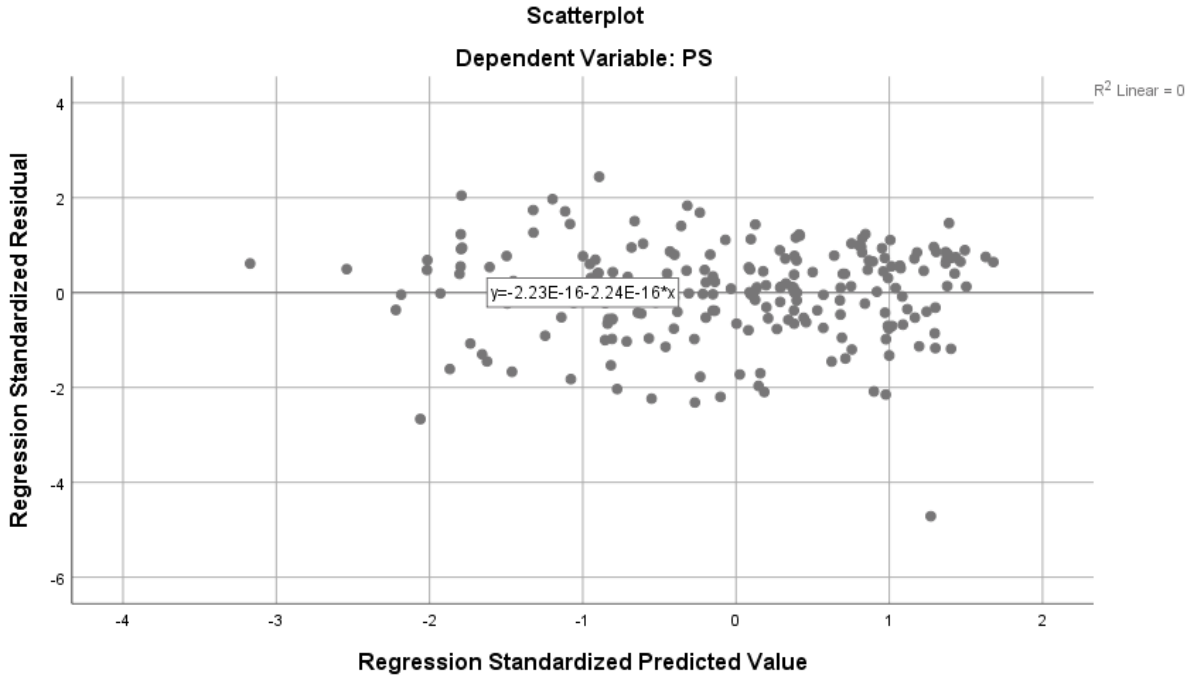

Table 46: LMX,WE & TI - Model Summary

Model Summary[b]

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	Change Statistics					Durbin-Watson
					R Square Change	F Change	df1	df2	Sig. F Change	
1	.504[a]	.254	.247	1.45567	.254	35.140	2	206	.000	1.153

a. Predictors: (Constant), LMX, WE
b. Dependent Variable: TI

Table 47: LMX,WE & TI - Anova

ANOVA[a]

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	148.923	2	74.461	35.140	.000[b]
	Residual	436.508	206	2.119		
	Total	585.431	208			

a. Dependent Variable: TI
b. Predictors: (Constant), LMX, WE

Table 48: LMX,WE & TI - Coefficients

Coefficients[a]

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.	95.0% Confidence Interval for B		Collinearity Statistics	
		B	Std. Error	Beta			Lower Bound	Upper Bound	Tolerance	VIF
1	(Constant)	7.505	.590		12.718	.000	6.341	8.668		
	WE	-.454	.105	-.348	-4.315	.000	-.661	-.246	.556	1.797
	LMX	-.298	.120	-.201	-2.488	.014	-.534	-.062	.556	1.797

a. Dependent Variable: TI

Figure 33: LMX,WE & PS P-P Plot

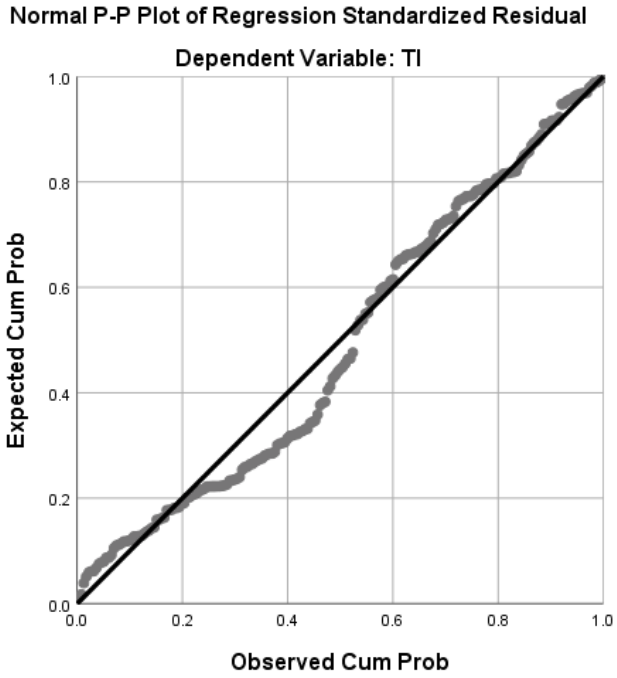

Figure 34: LMX, WE & TI Scatterplot

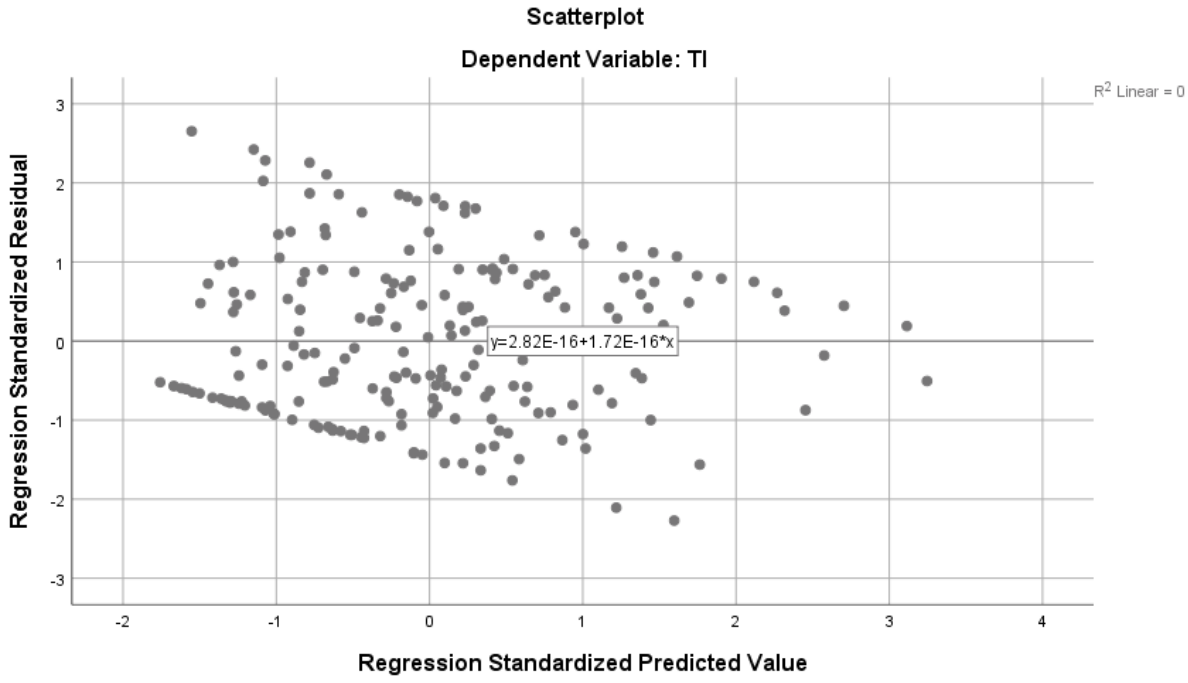

Table 49: WEE,WEC,WEP & PS - Model Summary

Model Summary[b]

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	Change Statistics					Durbin-Watson
					R Square Change	F Change	df1	df2	Sig. F Change	
1	.484[a]	.234	.223	.48379	.234	20.909	3	205	.000	2.045

a. Predictors: (Constant), WEP, WEE, WEC

b. Dependent Variable: PS

Table 50: WEE,WEC,WEP & PS - Model Summary

ANOVA[a]

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	14.682	3	4.894	20.909	.000[b]
	Residual	47.982	205	.234		
	Total	62.664	208			

a. Dependent Variable: PS

b. Predictors: (Constant), WEP, WEE, WEC

Table 51: WEE,WEC,WEP & PS - Coefficients

Coefficients[a]

Model		Unstandardized Coefficients		Standardized Coefficients			95.0% Confidence Interval for B		Collinearity Statistics	
		B	Std. Error	Beta	t	Sig.	Lower Bound	Upper Bound	Tolerance	VIF
1	(Constant)	1.821	.247		7.362	.000	1.333	2.309		
	WEC	.326	.088	.325	3.700	.000	.152	.500	.485	2.061
	WEE	.075	.070	.080	1.062	.289	-.064	.213	.659	1.518
	WEP	.202	.111	.146	1.822	.070	-.017	.421	.580	1.723

a. Dependent Variable: PS

Figure 35: WEE, WEC, WEP & PS P-P Plot

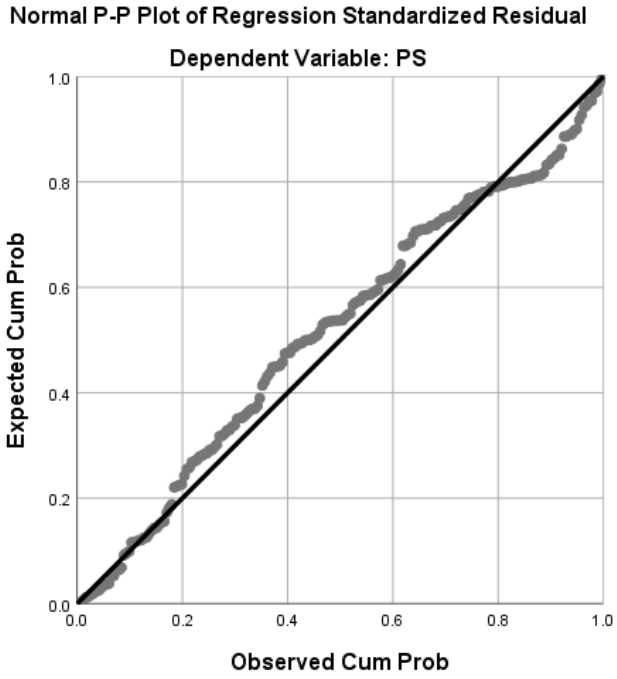

Figure 36: WEE, WEC, WEP & PS Scatterplot

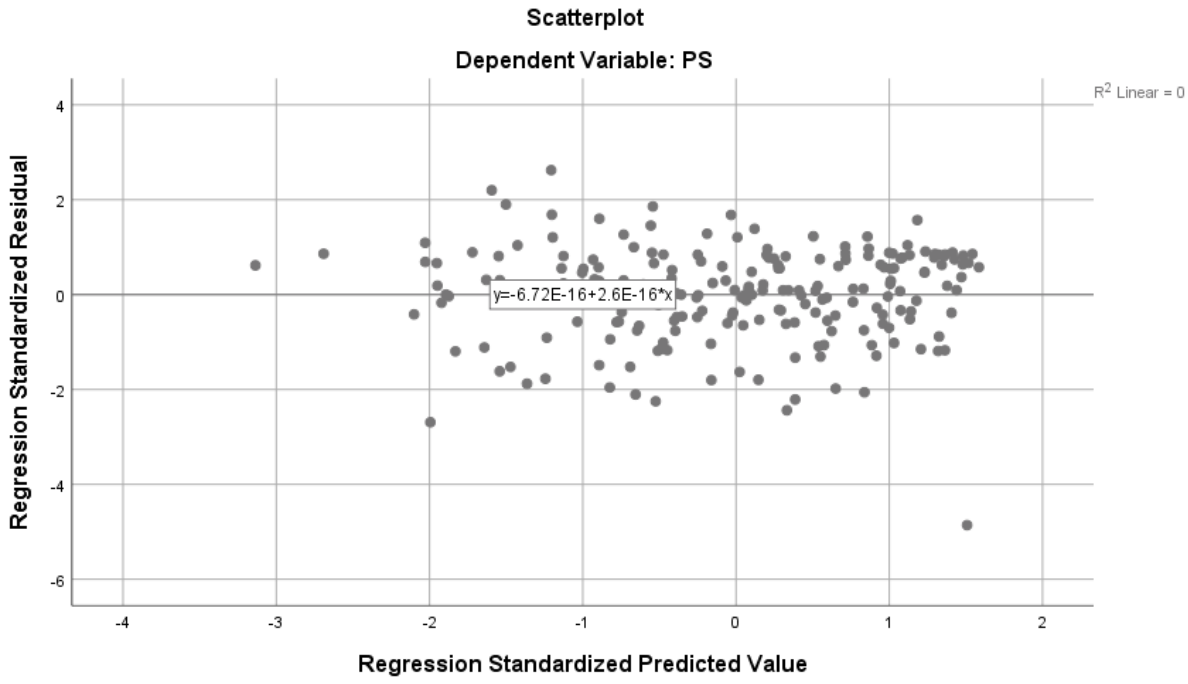

Table 52: WEE,WEP,WEC & TI - Model Summary

Model Summary[b]

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	Change Statistics				Durbin-Watson
					R Square Change	F Change	df1	df2	Sig. F Change	
1	.517[a]	.267	.256	1.44682	.267	24.890	3	205	.000	1.093

a. Predictors: (Constant), WEP, WEE, WEC

b. Dependent Variable: TI

Table 53: WEE, WEC, WEP & TI - Anova

ANOVA[a]

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	156.306	3	52.102	24.890	.000[b]
	Residual	429.125	205	2.093		
	Total	585.431	208			

a. Dependent Variable: TI

b. Predictors: (Constant), WEP, WEE, WEC

Table 54: WEE, WEP, WEC & TI - Coefficients

Coefficients[a]

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.	95.0% Confidence Interval for B		Collinearity Statistics	
		B	Std. Error	Beta			Lower Bound	Upper Bound	Tolerance	VIF
1	(Constant)	6.092	.740		8.236	.000	4.634	7.550		
	WEC	-.691	.264	-.225	-2.621	.009	-1.211	-.171	.485	2.061
	WEE	-1.087	.210	-.381	-5.169	.000	-1.501	-.672	.659	1.518
	WEP	.198	.332	.047	.597	.551	-.456	.853	.580	1.723

a. Dependent Variable: TI

Figure 37: WEE, WEC, WEP & TI P-P Plot

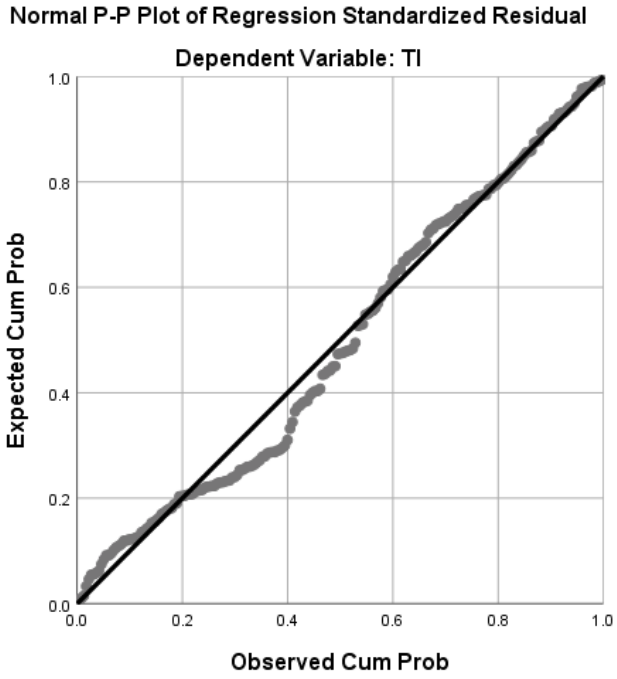

Figure 38: WEE, WEC, WEP & TI Scatterplot