

**Authentic leadership and safety consciousness:
The role of psychological empowerment and
psychological ownership at a South African mine**

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REMARKS

The reader is reminded of the following:

- The editorial style in the first and last chapters of this mini-dissertation follows the format prescribed by the Programme in Industrial Psychology of the North-West University (Vaal Triangle Campus).
- The referencing as well as the writing style used in this mini-dissertation ensures full compliance with prescriptions by the American Psychological Association (APA). This practice is in line with the policy of the Programme in Industrial Psychology of the North-West University (Vaal Triangle Campus) to use APA in all scientific documents and publications.
- This mini-dissertation is submitted in the form of a research article. The editorial style specified by the *South African Journal of Industrial Psychology* is used in the second chapter.

DECLARATION

I, Sibusiso Leonard Mnxuma, hereby declare that “Authentic leadership and safety consciousness: The role of psychological empowerment and psychological ownership at a South African mine” is my own work and that both the views and the opinions expressed in this mini-dissertation are my own and those of the authors as referenced in the text and indicated in the reference lists.

I furthermore declare that this work will not be submitted to any other academic institution for qualification purposes.

Sibusiso Leonard Mnxuma

May 2018

DECLARATION OF LANGUAGE EDITING

I hereby declare that I was responsible for the language editing of the mini-dissertation **Authentic leadership and safety consciousness: The role of psychological empowerment and psychological ownership at a South African mine**, submitted by Sibusiso L. Mnxuma.

A handwritten signature in dark ink. The first part of the signature is a stylized 'E' and 'D' enclosed in a circle, followed by the word 'diedericks' in a cursive script.

DR ELSABÉ DIEDERICKS

BA Hons HED Hons MA PhD

May 2018

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This quote by former president Thabo Mbeki kept me going when times were tough:

“Those who complete the course will do so only because they do not, as fatigue sets in, convince themselves that the road ahead is still too long, the inclines too steep, the loneliness impossible to bear and the prize itself of doubtful value.”

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SUMMARY

Title: Authentic leadership and safety consciousness: The role of psychological empowerment and psychological ownership at a South African mine

Key terms: Authentic leadership, leadership, psychological empowerment, empowerment, psychological ownership, ownership, safety consciousness, safety, mining.

The advent of globalisation has changed the world of business for ever, presenting numerous challenges which have in some instances resulted in both economic and ethical meltdowns. The mining industry is no exception; in fact, the industry has been faced with challenges that include, amongst others, a volatile market and increased financial strain as well as human resource issues, often resulting in labour unrest and safety incidents. Stakeholders turn to organisational leaders and supervisors for solving these compounding problems confronting industry. Leadership plays an integral role in addressing these issues, however, very few in the leadership ranks are equipped to skilfully and effectively address these challenges. In order for the South African mining industry to effectively address these challenges, leadership within this safety critical environment needs to be examined from the perspective of authentic leadership.

Authentic leadership has been linked to a number of positive employee and organisational outcomes, including psychological empowerment, psychological ownership and safety consciousness. Employees who experience their leaders as authentic and empowering are likely to display positive work behaviours. Due to the perceived control over their environment, psychologically empowered employees are likely to develop psychological ownership towards their organisation, behaving in ways that promote the best interests of their organisation. Within a safety critical environment, such as mining, employees experiencing psychological ownership towards their organisation are likely to display work behaviours and attitudes that promote safety performance; thus developing a heightened level of safety consciousness. The objectives of this study were to determine the relationship between authentic leadership, psychological empowerment, psychological ownership and safety consciousness. In addition, another objective was to determine if psychological empowerment and psychological ownership had any effect on the relationship between authentic leadership and safety consciousness.

A sample of 283 managers/supervisors was obtained from a mining organisation in the Free State province of South Africa. Questionnaires were distributed and all managers/supervisors were given the choice to participate in the research. The following measuring instruments were utilised, namely the Authentic Leadership Questionnaire, Measuring Empowerment Questionnaire, Psychological Ownership Measure and Safety Consciousness Scale. Descriptive and inferential statistics, Raykov's rho coefficients, Pearson product-moment correlations coefficients, Mplus and bootstrapping were used to analyse the data.

The results of the study indicated that authentic leadership had a statistically significant positive relationship with only two dimensions of psychological empowerment, namely impact and competence. Authentic leadership had a statistically significant positive relationship with psychological ownership. Authentic leadership had a statistically significant indirect effect on psychological ownership via impact. Psychological empowerment did not have a statistically significant positive relationship with safety consciousness. Psychological ownership had a statistically significant positive relationship with safety consciousness. Authentic leadership had a statistically significant indirect effect on safety consciousness via psychological ownership. Furthermore, authentic leadership did not have a statistically significant indirect effect on safety consciousness via psychological empowerment.

A number of recommendations were made for the mining sector and for future research. It is important that organisations understand the impact of authentic leadership on outcomes such as psychological empowerment, psychological ownership and safety consciousness. Organisation should, when selecting leaders, select leaders who display the four dimensions of authentic leadership. The organisation should invest in the development of authentic leaders, through interventions and leadership programmes. Recommendations for future research included undertaking longitudinal research designs as well as transcending industry lines and looking into different industries, provinces and organisations. A mixed method approach may also be employed in future research.

CHAPTER 1

INTRODUCTION

This mini-dissertation was centred on the relations between authentic leadership, psychological empowerment, psychological ownership and safety consciousness. Contained in this chapter is the problem statement and a discussion of the research objectives (general and specific objectives). Additionally, an explanation of the research method and the chapter division are given.

1.1 PROBLEM STATEMENT

The global mining industry continues experiencing major changes (Williams, 2011; Wilson, 2011) relating to globalisation, a volatile market, restrictive legislation, new technologies and an increased demand for productivity and efficiency (Day, 2014; Kelloway, Nielsen, & Dimoff, 2017; Newell, 2002; Ivancevich, & Matteson, 2014). Within global markets, this demand for increased operational and cost efficiency has resulted in the mining sector progressively adopting automated or mechanised technologies (International Business Publications, 2014; Williams, 2011; Wilson, 2011). In contrast, the South African mining sector which, according to Statistics South Africa (2018), contributes R8 to every R100 produced by the country's economy (8% of GDP), still remains very labour intensive and is considered one of the largest employers of unskilled and semi-skilled labourers (International Business Publications, 2014).

According to the National Planning Commission (2012);

The National Development Plan aims to eliminate poverty and reduce inequality by 2030. South Africa can realise these goals by drawing on the energies of its people, growing an inclusive economy, building capabilities, enhancing the capacity of the state, and promoting leadership and partnerships throughout society.

As such, the mining sector is imperative to government's efforts of achieving the objectives of the National Development Plan, with the main objectives being to significantly reduce unemployment and eradicate poverty (Anglo American, 2014; National Planning Commission, 2012). It is important to note that these objectives can also be achieved through

collaborative efforts between government and a major contributor such as the mining sector, with emphasis on the attainment of production targets. This emphasis on productivity is the basis upon which a culture of high performance has been established within the South African mining sector (National Planning Commission, 2012).

The demand for high performance within the labour intensive South African mining sector does, however, present a myriad of challenges (Anglo American, 2014), which include increased expectations of higher remuneration, industrial action, a higher turnover rate, challenges of labour capacity and capability, safety incidents which then result in production stoppages, stricter regulation and intensified government involvement (Anglo American, 2014; International Business Publications, 2014; Williams, 2011; Wilson, 2011).

According to the International Labour Organisation (ILO), more than 2.78 million fatal work-related accidents are reported globally per annum, whilst about 2.01 million non-fatal accidents and 2 643 deaths per year occur in South Africa (ILO, 2018). Though there have been significant improvements since 1993, with an 88% reduction in fatalities, safety does, however, remain a serious challenge in the South African mining sector (Solidarity, 2015). According to a fact sheet released by the Chamber of Mines of South Africa in 2017, a total of 73 fatalities were recorded in 2016. Stakeholders agree that the fatality and injury rate remains high, especially in underground gold mines.

According to de Koster, Stam, and Balk (2011), the main focus of research in the area of operations management has been on the drivers of safe behaviour and workplace safety in different operational environments. However, occupational research is still rather scarce, with less than 1% of organisational research publications in the top journals being related to the subject of safety at work (Barling, Loughlin, & Kelloway, 2002). According to Jilcha and Kitaw (2016), the situation has not improved much since 2002.

Given the fact that employees remain a vital part of the South African mining industry, the challenges mentioned above require unique solutions in order to ensure organisational effectiveness and performance (Anglo American, 2014). Previous research indicates that creating a psychologically empowered work environment may be a possible solution, through balancing organisational demands with individual performance and preferences (Fisk, Grove, & John, 2009; Mehdi & Saeid, 2010; Nelson et al., 2014; Wang & Lee, 2009).

A psychologically empowered organisational climate has shown to positively impact both individual (e.g., psychological ownership, safety consciousness) and organisational (e.g., decreased safety incidents, increased performance) outcomes (Akbar, Salehizadeh, Mehdi, & Saeid, 2010; Nasiripour, & Siadati, 2011; Wang & Lee, 2009). Nelson et al. (2014) identify authentic leaders as crucial role players in fostering such a psychologically empowering work environment. As such, authentic leadership and its effect on the work environment appear to have a positive influence on employee experiences of psychological empowerment and, thus, individual and organisational outcomes (Charalabidis & Koussouris, 2012; Healy, 2017). In contrast, high turnover intentions are reported amongst employees who experience their leaders and work environments as being autocratic, disempowering and dissatisfying (Hay Group, 2013; Laschinger, Finegan, & Wilk, 2009). Further, research suggests that actual staff turnover is estimated at as much as 30% within the first year and up to 57% after the second year where individuals are employed within disempowering work environments created by leaders (Laschinger et al., 2009). These turnover estimates present a threat to sustainable economic growth and hampers the provisions of the NDP and the future of the mining industry; therefore, the economic sustainability of South Africa's GDP depends largely on the retention of skilled employees within this safety critical sector (Anglo American, 2014).

According to Griffin and Curcuruto (2016), attributes of organisational management, including leadership style, contribute either directly or indirectly to safety incidents within organisational context. Whether empowering or disempowering, leadership style shapes the motivation to work safely and the kind of unsafe behaviour enacted. Schutte (1998) asserts that disempowered employees have a poor perception of work, safety and quality, arguing that these poor perceptions result in a lack of commitment and trust, poor safety attitude and careless safety behaviour which thus leads to poor safety performance.

Based on the normal accident theory, de Koster, Stam, and Balk (2011) argue that decentralisation will foster safety. This can be achieved through the empowerment of employees as decentralised decision makers and by increasing their safety knowledge. Empowerment through increased responsibility and decision-making knowledge increases intrinsic motivation to improve safety (Hechanova-Alampay & Beehr, 2001). Through creating a psychologically empowered work climate, authentic leaders are therefore able to retain talent and foster positive work behaviour by harnessing attitudes of psychological ownership among their followers (Anglo American, 2014; Fisk, Grove, & John, 2009; International Business Publications, 2014).

In support, Olckers and du Plessis (2012b) indicate that when authentic leaders create a psychologically empowered climate, employees are more likely to take ownership of their work roles and tasks. Empowerment is, according to Conger and Kanungo (1988), a motivational construct, occurring when power moves/transfers from a higher level (organisational leadership), to lower levels (staff/employees/subordinates), resulting in a sense of control and ownership. According to O'Reilly (2002), this is a feeling on the part of the employees that they have a responsibility to make decisions and behave in ways that are in the long-term interest of the company.

Empowered employees, due to self-determination and autonomy, have a greater sense of personal efficacy, which is critical to experiences of psychological ownership (Conger & Kanungo, 1988; Fisk et al., 2009; Kim & Beehr, 2017). Psychological ownership relates to the feelings of possession in the absence of legal/formal ownership; it is the sense of possessing objects where the objects become an extension of one's 'self, with close links to the employee's identity (Kim & Beehr, 2017; Olckers & du Plessis, 2012b). According to Beaglehole (1932) and Furby (1978), there is a strong sense of responsibility that stems from feelings of possession; this includes a responsibility to invest time and energy towards advancing the cause of the organisation by being proactive, protective, caring and nurturing (Hall, 1966). This is in line with assertions made by O'Reilly (2002), regarding a feeling of responsibility on the part of employees to make decisions and enact behaviours that serve the long-term interests of the organisation. Within the context of mining, this could relate to a stronger sense of responsibility, not only for the production performance, but also including safety performance and safe work behaviour (Curcuruto, 2016).

Psychological ownership is associated with positive behavioural and social-psychological consequences (Olckers & Enslin, 2016), such as expectations of success and proactive behaviour in relation to organisational objectives (Curcuruto, 2016). With employees spending a significant amount of their daily lives at work, Olckers (2017) argues it is likely that feelings of psychological ownership will develop within and towards organisations, as this daily interaction with the workplace fosters motives of psychological ownership (self-efficacy and effectance (the causal effect on an object in the environment), self-identity and belongingness/relatedness).

With the persistent challenge of retaining labour, disempowered, dissatisfied employees will almost always seek alternative employment; psychological ownership has been shown to

positively assist in retaining talent and influencing employees' decisions to remain with the organisation (Olckers, 2017). Given the ubiquitous nature of feelings of possession, it is important to consider that psychological ownership may occur in relation to an array of different organisational targets, which may include things such as the organisation itself, the job, work tasks, work space, work tools or equipment, ideas or suggestions, team members, work safety and safe work behaviour (Rudmin & Berry, 1987; Van Dyne & Pierce, 2004).

Safety within the mining sector remains a critical challenge (Solidarity, 2015). According to a safety report on global occupational health and safety in mining, 6 300 people die every day as a result of occupational accidents and work-related disease (amounting to 2.3 million deaths per year); with 317 million accidents occurring on the job annually, many of these resulting in extended absenteeism and thus related costs (Teck, 2015). The volatile nature of underground mining operations Authentic leadership has, however, been shown to have a positive impact on safety consciousness, through regular feedback, transparency and fairness (Cavazotte, Duarte, & Gobbo, 2013). Safety consciousness and compliance are predicted by the establishment of a work environment that advocates safety and safe work behaviours; this stems from the psychologically empowering nature of authentic leaders (Clarke, Probst, Guldenmund, & Passmore, 2015). The present study argues that, besides leaders' decision making in implementing systems, their leadership behaviour towards their subordinates is also of critical importance for safety performance.

Safety consciousness refers to the values and attitudes that inform safety-related decisions and subsequent behaviour (de Koster et al., 2011). The absence of safety consciousness gives birth to a general state of ignorance in relation to safety hazards/risks and safe work practices, consequently resulting in an increased number of safety incidents and accidents (Haines, 2011). In a safety critical environment, such as mining, it is crucially important for the entire workforce to remain focused at all times, as their own safety and that of others (fellow employees) is constantly under threat (Nielsen, Eid, Mearns, & Larsson, 2011).

A lack of safety consciousness has a major negative effect on the overall efficiency and level of safety within an organisation (Mol, 2003). When employees lack the mindfulness that comes with being safety conscious, this translates into unsafe behaviours and work practices, manifesting in a complete disregard of their own safety and that of fellow employees (Mol, 2003). With the high level of government involvement through the Department of Mineral

Resources within the safety critical South African mining industry, unsafe work behaviours due to a lack of safety consciousness are sanctioned with production stoppages.

According to Kieffer (1984), a sense of powerlessness or feeling of disempowerment stems from continuous interaction between the person and his/her environment, which combines with a sense of generalised distrust, a perception of lack of resources to influence one's environment, an experience of economic vulnerability and a sense of hopelessness with regard to the socio-political struggle and survival in the socio-economic arena. As such, disempowered employees lack the psychological ownership required to autonomously undertake work tasks and may neglect to react to or inform supervisors of important safety-related information or address critical safety hazards which could lead to future safety incidents/accidents. It is thus crucial for the safety performance of the South African mining industry and the safety of its labour force to ensure the sort of authentic leadership that will facilitate safety consciousness through a psychologically empowering workplace, which will also foster psychological ownership (Heller, Judge, & Watson, 2002; Olckers & du Plessis, 2012a; Pavot & Diener, 2008).

Based on the aforementioned problem statement and literature review, the aim of this study is to investigate the relationship between authentic leadership, psychological empowerment, psychological ownership and safety consciousness within a South African mining organisation. This relationship is depicted in the structural model as shown in Figure 1.

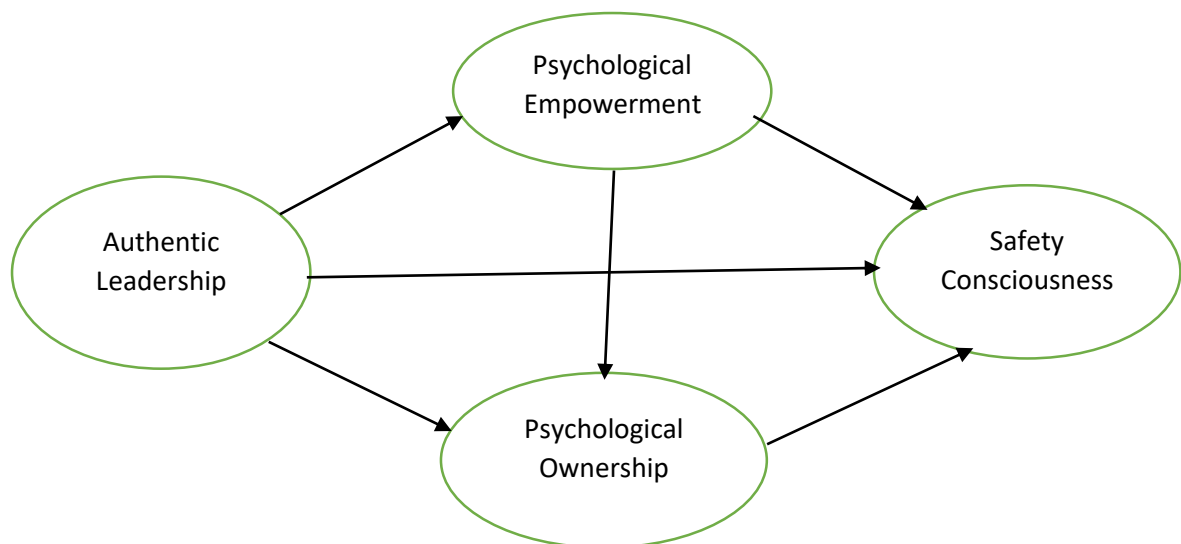


Figure 1. A hypothesised model of authentic leadership, psychological empowerment, psychological ownership and safety consciousness.

1.2 Research Questions

The following research questions emerged from the above-mentioned problem statement:

- How are authentic leadership, psychological empowerment, psychological ownership and safety consciousness conceptualised in literature?
- What is the relationship between authentic leadership, psychological empowerment psychological ownership and safety consciousness, according to literature?
- What is the relationship between authentic leadership, psychological empowerment, psychological ownership and safety consciousness among supervisors at a South African mine?
- Does authentic leadership, psychological empowerment and psychological ownership predict safety consciousness?
- Does psychological empowerment indirectly affect the relationship between authentic leadership and psychological ownership?
- Does psychological empowerment indirectly affect the relationship between authentic leadership and safety consciousness?
- Does psychological ownership indirectly affect the relationship between authentic leadership and safety consciousness?
- What recommendations can be made for future research?

In order to answer the above research questions, the following research objectives were set.

1.3 RESEARCH OBJECTIVES

The research objectives are divided into general and specific objectives.

1.3.1 General Objective

The general objective of the study was to explore the relationship between authentic leadership, psychological empowerment, psychological ownership and safety consciousness amongst supervisors at a South African mine.

1.3.2 Specific Objectives

The specific objectives are the following, namely to:

- determine how authentic leadership, psychological empowerment, psychological ownership and safety consciousness are conceptualised in literature;
- investigate the relationship between authentic leadership, psychological empowerment, psychological ownership and safety consciousness, according to literature;
- ascertain if there is a relationship between authentic leadership, psychological empowerment, psychological ownership, and safety consciousness among supervisors at a South African mine;
- establish if authentic leadership, psychological empowerment and psychological ownership predict safety consciousness.
- determine if psychological empowerment indirectly affects the relationship between authentic leadership and psychological ownership;
- establish if psychological empowerment indirectly affects the relationship between authentic leadership and safety consciousness;
- investigate whether psychological ownership indirectly affects the relationship between authentic leadership and safety consciousness; and
- make recommendations for future research.

1.4 RESEARCH METHOD

The research method comprised two phases, namely a literature review and an empirical study. The results obtained from the research are presented in the form of a research article.

1.4.1 Research Approach and Design

The study followed a quantitative cross-sectional survey design. This is a research approach in which data is converted into numeric form and undergoes statistical analysis, in order to test and describe the relationships that exist (De Vos, Strydom, Fouche, & Delport, 2011; Struwig & Stead, 2011). Data collection does not stretch over a period of time when using cross-sectional approach, but it is only collected once off. (De Vos et al., 2011). The cross-sectional survey design allows a focus on multiple variables and captures a specific point in

time. It is, however, unable to be used to study behaviour over long periods of time (De Vos et al., 2011).

1.4.1.1 Literature Review

Literature will be obtained by conducting computer searches via databases such as Academic Search Premier; Business Source Premier; PsycArticles; PsycInfo; EbscoHost; GoogleScholar; Google Books; Emerald; ProQuest; SACat; SAePublications and Science Direct.

The main journals that will be consulted due to their relevance to the topic of interest will consist of the: *Journal of Occupational Health Psychology*, *Journal of Managerial Psychology*, *Journal of Positive Psychology*, *International Journal of Leadership Studies*, *South African Journal of Industrial Psychology*, *Review of General Psychology*, *Work & Stress*, *Journal of Applied Psychology*, *Leadership quarterly*, *Journal of Business Ethics*. *Keywords to be used are, Authentic Leadership, Self-efficacy, Self-referent, and Performance.*

1.4.2 Research Participants

A census-based sampling method was employed. A census study occurs if the entire population is very small or it is reasonable to include the entire population (for other reasons). It is called a census sample, because data is gathered on every member of the population (De Vos et al., 2011; Struwig & Stead, 2011).

Approval to conduct research was requested by the researcher from the organisation's management prior to data collection. After permission was granted hardcopy questionnaires were distributed in envelopes. Attached was a letter outlining the study, study purpose and a request for participation, together with a consent form. Departmental managers were tasked with dispensing the envelopes among supervisory staff. The questionnaires were between 30 minutes and 35 minutes long and participants were allowed to complete the questionnaire in their own time, over a period of 6 weeks. Reminders regarding the deadline were sent to departmental managers, who would then pass it on to the participants. The first reminder was sent out after the first week and the second was sent out a week before the deadline. In order to ensure confidentiality, the questionnaires were placed in a locked box by the Human Resources office. All the data gathered was used only for the purpose of the current research

study and reported in aggregated form. Participation was voluntary, anonymous and there were no consequences for those who declined the request to participate

1.4.3 Measuring Instruments

The following questionnaires were used in the empirical study:

Biographical questionnaire: All participants were requested to complete a biographical questionnaire which allowed the researcher to gather information regarding various participant characteristics. These characteristics included age, gender, home language, race, level of education, tenure, position, and job level in current organisation.

Authentic leadership: The *Authentic Leadership Questionnaire* (ALQ; Walumbwa, Avolio, Gardner, Wernsing, & Peterson, 2008) is a 16-item questionnaire measuring authentic leadership perception. Participant responses were based on a five-point scale, varying from 1 = (strongly disagree) to 5 = (strongly agree). The questionnaire comprises four subscales, namely *self-awareness*, for which an example item is, “My immediate supervisor knows when it is time to re-evaluate his or her positions on important issues” ($\alpha = .73$); *relational transparency*, for which an example item is, “My immediate supervisor says exactly what he or she means” ($\alpha = .77$); *internalised moral perspective*, for which an example item is, “My immediate supervisor makes decisions based on his/her core values” ($\alpha = .73$); and *balanced processing*, for which an example item is, “My immediate supervisor listens carefully to different points of view before coming to conclusions” ($\alpha = .70$) (Walumbwa et al., 2008).

Psychological empowerment: The *Measuring Empowerment Questionnaire* (MEQ; Spreitzer, 1995), a 12-item questionnaire measuring perceptions of psychological empowerment, was used. Each item was answered on a five-point scale, with 1 = (strongly disagree) and 5 = (strongly agree). The questionnaire comprises four subscales, namely *meaning*, for which an example item is “The work I do is important to me” ($\alpha = .92$); *competence*, for which an example item is “I have the skills to successfully do my job” ($\alpha = .89$); *self-determination*, for which an example item is “I have freedom to decide how to do my job” ($\alpha = .91$); and *impact*, for which an example item is “I have control over what happens in my section” ($\alpha = .84$).

Psychological ownership: The *Psychological Ownership Measure* (POM; Van Dyne & Pierce, 2004) is a seven-item questionnaire measuring psychological ownership. Participants

gave a response based on a seven-point scale varying from 1 = (very strongly disagree) to 7 = (very strongly agree). The measure looks at employees' individual feeling of possession towards the organisation, with example items such as "This is MY organization" and "This is OUR company". The Cronbach's alpha coefficient for the POM is .90 (Olckers, 2012b; Van Dyne & Pierce, 2004).

Safety consciousness: The *Safety Consciousness Measure* (Barling et al., 2002) is a seven-item questionnaire measuring safety consciousness. The scale was adapted to be relevant to the mining environment. An example item is "I am well aware of the safety risks involved in my job". The scale assesses an individual's own awareness of safety issues, with respondents indicating their agreement with each item on a 5-point scale, namely 1 = (strongly disagree) to 5 = (strongly agree) (de Koster et al., 2011). The Cronbach's alpha coefficient for the SCM is .74 (Barling, et al., 2002).

1.4.4 Statistical Analysis

SPSS 25 and M-plus 8 programs were utilised for the statistical analysis of the data (IBM Corporation, 2017; Pallant, 2010; Muthén & Muthén, 1998-2017). Composite reliability was determined through the use of either the rho or phi coefficients. Descriptive statistics (mean, standard deviation, skewness, and kurtosis) and inferential statistics (correlations and structural equation modelling) were utilised to analyse the data (Pallant, 2010). Pearson product-moment or Spearman correlation coefficients were used to specify the relationships between variables, based on the normality of the data. Effect sizes were used to determine the practical significance of the results depending on the distribution of the variables (Steyn, 2002). Cut-off points of 0.30 (medium effect) and 0.50 (large effect) were set for practical significance of the correlation coefficients.

Structural equation modelling (SEM) was used to determine regression paths between the variables. Competing measurement models were tested against the data to determine which factorial model fits the data best. A confirmatory factor analysis (CFA) approach was employed as part of comparing competing measurement models (Byrne, 2010).

An evaluation of the structural model was done, where regression relationships that relate to the hypotheses were inserted. The best fitting model was thus utilised as a baseline. Various indices, including the chi-square (χ^2), degrees of freedom (df), goodness-of-fit index (GFI),

root mean square error of approximation (RMSEA) cut-off points .01, .05, and .08 for excellent, good, and mediocre fit, respectively, and incremental fit indices were utilised to assess the model's fit to the data. Incremental fit indices include the Tucker-Lewis index (TLI) as well as the comparative fit index (CFI); a value of $CFI \geq 0.95$ is recognised as indicative of good fit (Hooper, Coughlan, & Mullen, 2008).

1.4.5 Ethical Considerations

An ethics application was submitted to the Ethics Committee of the North-West University for approval prior to data collection in the mining organisation (ethics number NWU-HS-2017-0109). The current study was guided by strict ethical guidelines, ensuring that participants were aware that their participation was voluntary; that all participants gave informed consent and that their anonymity and confidentiality was assured. Care was taken to ensure that no harm was done to participants and that their rights and dignity were respected

1.5 EXPECTED CONTRIBUTIONS OF THE STUDY

1.5.1 Expected Contributions for the Individual

With a greater awareness of the impact of authentic leadership on the work environment and subsequent influence on positive psychological experiences at work, the individual will potentially reap the benefits of resulting authentic leadership development initiatives within the organisation. Individuals might also gain better insights into their individual level of safety consciousness and the extent to which this contributes to their attitudes and behaviours towards their own safety at work and that of fellow employees.

1.5.2 Expected Contributions for the Organisation

By determining the relationship between authentic leadership, psychological empowerment, psychological ownership and safety consciousness, a better understanding will potentially be established on how to create a safe work environment through focusing on psychological components associated with adopting safety consciousness. Organisations might gain a better understanding of how authentic leadership can be developed and utilised toward harnessing psychological capacities, necessary for enhancing safety consciousness among its employees and, in turn, safe work practices and safe production within the organisation.

1.5.3 Expected Contributions for I/O Psychology Literature

Authentic leadership is a relatively new concept which is being explored more and more; at present, there is very little leadership research specific to the South African context, especially research on authentic leadership, in the South African mining industry and how it relates to safety-related outcomes. The study aims to add to the existing body of knowledge regarding organisational leadership and its impact on performance, specifically within a South African mining context. Another objective is provoking an interest in conducting future research in the field, with a specific focus on risk management and mitigation through psychological views on managing safety.

1.6 CHAPTER DIVISION

The lay-out of this mini-dissertation is as follows:

Chapter 1: Introduction, problem statement, research objectives and contributions of the study

Chapter 2: Research article

Chapter 3: Conclusions, limitations and recommendations

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CHAPTER 2

RESEARCH ARTICLE

Authentic leadership and safety consciousness: The role of psychological empowerment and psychological ownership at a South African mine

Abstract

Orientation: International research on authentic leadership has been extensive; the South African mining context, however, has seen limited research on this construct. Furthermore, research on the relationship between authentic leadership, psychological empowerment, psychological ownership and safety consciousness is limited.

Research purpose: The study intended to determine possible relationships and indirect effects between authentic leadership, psychological empowerment, psychological ownership and safety consciousness, as well as the mediating role of psychological empowerment and psychological ownership.

Motivation for the study: Safety remains a serious challenge in South African mines. Psychological empowerment is shown to positively impact experiences of perceived control, autonomy and efficacy, all of which contribute to the development of psychological ownership, which is known to result in employee behaviours that promote the best interests of the organisation. It is clear from literature that psychological empowerment is influenced by authentic leadership.

Research design, approach and method: A cross-sectional survey design was used with a census-based sample ($N = 283$) of supervisors from a mining company within South Africa. The Authentic Leadership Questionnaire, Measuring Empowerment Questionnaire, and Psychological Ownership Measure and Safety Consciousness Scale were administered.

Main findings: Authentic leadership is positively related to the impact and competence dimensions of psychological empowerment, psychological ownership and safety consciousness. Authentic leadership has an indirect effect on psychological ownership via the impact dimension of psychological empowerment. Authentic leadership did not have an indirect effect on safety consciousness via psychological empowerment. Authentic leadership has an indirect effect on safety consciousness via psychological ownership. Authentic leadership has a direct effect on safety consciousness.

Practical/managerial findings: The results provide line supervisors with insights into the effect of authentic leadership on psychological empowerment, psychological ownership and safety consciousness. Leaders/supervisors in the mining environment play a key role in promoting safety consciousness and an overall culture of safety; the results also provide supervisors with insight into the importance of authentic leadership for the development of psychological empowerment, psychological ownership and safety consciousness.

Contribution/value-added: The study contributes to authentic leadership literature, within a South African context. Furthermore, the study contributes to literature by indicating the indirect effects of authentic leadership on psychological empowerment, psychological ownership and safety consciousness.

Keywords: authentic leadership, leadership, psychological empowerment, empowerment, psychological ownership, ownership, safety consciousness, safety, mining.

INTRODUCTION

Leadership remains crucial to the success of any organisation, whether profit or non-profit driven, or whether it is a formal or an informal business (Canwell, Dongrie, Neveras, & Stockton, 2014; Suar, Tewari, & Chaturbedi, 2006). Organisations across the world are facing a unique set of challenges, ranging from ethical failures to terrorism. It is during these challenging times that leadership is most difficult, however, it is during these times that leadership is most needed (Avolio, & Gardner, 2005). It is, thus, no surprise that leadership remains one of the most researched topics of our time (Brown & Bryant, 2015; Cascio & Aguinis, 2008; Coetzee & Van Zyl, 2014; Jooste, 2013; Luthans, 2010; Mendenhall, Osland, Bird, Oddou, & Maznevski, 2008).

The South African mining industry is no exception to the above challenges, with stakeholders' expectations being that leaders provide solutions to the myriad of challenges confronting the sector, including ongoing change, recession, downsizing, productivity and workplace safety (Chamber of Mines, 2017; Hughes, 2010; Solidarity, 2015). It is during these trying times that leaders have a responsibility to give clear, effective and principled leadership that provides stability, hope, meaning and safety for employees (Carey, Patsalos-Fox, & Useem, 2010; PWC, 2017). We are of the view that this can be done through a psychologically empowering form of leadership which aims to increase followers' feelings of psychological ownership towards the organisation and foster an overall sense of safety consciousness.

According to Bill George, former head of Medtronic, we need leaders that will lead with a strong sense of purpose, values and integrity; leaders that endeavour to build enduring organisations. "I would like to offer a new definition of successful 21st century leaders. They are authentic leaders who bring people together around a shared mission and values, and empower them to lead, in order to serve their customers while creating value for all their stakeholders" (George, 2007, p. 12). This is a sentiment shared by Hollis (2017) who assert that 'the need for authentic leaders has accelerated in recent years' (The need for authentic leaders has accelerated in recent years, para. 6).

LITERATURE REVIEW

Authentic Leadership

The concept of authenticity can be traced as far back as the writings of Aristotle (Harter, 2002) and many other Greek philosophers, who advocated it as a moral response to declining civic and religious values (Amornpipat & McLean, 2016). In the realm of philosophy, authenticity is conceptualised as a moral virtue and ethical choice, while psychological meanings of authenticity have been referred to in individual traits/states and identities; and according to leadership studies, as leadership or organisational characteristics that show leaders as being true to themselves (Alok & Israel, 2012; Novicevic, Harvey, Buckley, Brown, & Evans, 2006).

Authenticity initially took on a very philosophical conceptualisation when it first appeared in leadership studies in the 1960s. Rome and Rome (1967) described authenticity as “the extent to which a hierarchic organisation, through its leadership accepts limitations/boundaries, uncertainty, and contingency; realizes its capacity for responsibility and choice; acknowledges guilt and errors; fulfils its creative managerial potential for flexible planning, growth, and charter or policy formation; and responsibly participates in the wider community” (p. 185).

Carl Rogers and Abraham Maslow, major psychologists of the humanist movement, posited some of the most impactful ideas when it comes to authenticity. Defining the fully functioning human being, Rogers (1961) described this individual as one who can openly accept, interpret and act upon his/her emotional responses to internal states. Rogers warned that, those who are unable to do this, are at risk of stagnating and never becoming fully-realised as a person. In support Maslow (1968) argued that authenticity is a higher-order need which needs to be fulfilled before one can self-actualise. According to Maslow, authenticity is the synchrony between the individual’s personal thoughts (self-concept) and what the person is experiencing. Inauthenticity/maladjustment is thus the result of the incongruence between one’s self-concept and one’s lived experiences. Though the humanist movement provided many influential ideas, it did not provide sufficient empirical evidence (Mengers, 2014), however, the works of both Rogers and Maslow form the basis of modern definitions of authenticity.

Deci and Ryan (1995), through their self-determination theory, hold the view that human beings have three basic needs, namely autonomy, competence and relatedness. These authors argue that fulfilment of these basic needs leads to an internalisation of goals, which Sheldon and Elliot (1999) describe as the prerequisite of authenticity. According to Deci and Ryan (2000), the two needs of autonomy and competence are especially key in cultivating authenticity. In their study Heppner, Kernis, Nezlek, Foster, Lakey, and Goldman (2008) found positive correlations between the satisfaction of autonomy, competence and relatedness needs, and authenticity.

As part of a large study on optimal self-esteem, Kerins (2003) offers a more empirically grounded perspective on authenticity, defining it as “the unobstructed operation of one’s true, or core, self in one’s daily enterprise” (p. 16). Although there are many definitions of authenticity, it is important not to confuse authenticity with sincerity, the latter having to do with congruence between what is claimed/affirmed and what is actually felt in interactions with others (Avolio & Gardner, 2005; Erickson, 1995). Similar to Maslow (1968), authenticity on the other hand refers to being true to oneself. It would seem that authenticity has more to do with finding consistency between what one says and what one does (Avolio & Gardner, 2005).

Furthermore, Kernis and Goldman (2006) conceptualise authenticity as including four components, namely (1) self-awareness (i.e. knowledge and trust in one’s thoughts, feelings, motives and values); (2) unbiased processing of self-relevant information (i.e. objectivity about and acceptance of one’s positive and negative attributes); (3) authentic action (i.e. acting based on one’s true preference, values, and needs rather than merely acting to please others, secure rewards, or avoid punishments); and (4) authentic relations (i.e. achieving and valuing truthfulness and openness in one’s close relationships)” (Amornpipat & McLean, 2016). This multi-component conceptualisation of authenticity forms the theoretical foundations of authentic leadership (Alok & Israel, 2012; Amornpipat & McLean, 2016).

Authentic leadership is a positive form of leadership which forms part of what Avolio and colleagues (Avolio et al., 2004; Gardner, Avolio, Luthans, May, & Walumbwa, 2005) conceptualise as not only being true to oneself, which most conceptualisations have in common (Peus, Wesche, Streicher, Braun, & Frey, 2012), but as also including and emphasising a moral component. This is the authentic leader’s ability to judge dilemmas from different angles and to take into consideration different stakeholder needs (May, Chan,

Hodges, & Avolio, 2003). Developing the moral component of authentic leadership. Organizational dynamics.. According to Maximo (2015), authenticity focuses on one's ability to remain true to oneself over and above others; authentic leadership on the other hand places attention on the relationship between the leader and subordinates, something a very few leadership theories do.

Both Ilies, Morgeson, and Nahrgang (2005) and Gardner et al. (2005) draw heavily from the work of Kernis and Goldman (2006), however, Gardner and colleagues modify the terms to better reflect their conception. They specifically use the term “balanced processing” instead of unbiased processing; recognising the work done in cognitive psychology that humans are inherently flawed and biased in the processing of information (Fiske & Taylor, 1991; Tice & Wallace, 2003). Without arguing that authentic leaders are free of cognitive bias, Gardner et al. (2005) assert that authentic leaders are inclined to consider multiple sides and multiple perspectives as they assess information in a relatively balanced manner when dealing with an issue/s. Preference is also given to the term “relational transparency”, instead of relational authenticity, as it better reflects the open manner in which authentic leaders are posited to share information with others (Avolio & Gardner, 2005). In support, Alok and Israel (2012) describe authentic leadership as “a higher order, multi-dimensional construct which comprises self-awareness, balanced processing of information, relational transparency and internalised moral standards” (p. 499).

Self-awareness refers to an awareness of one's own values, identity, emotions, goals and motives. Authentic leaders are thus aware of their core values and do their best not to compromise these (Avolio et al., 2004; Gardner et al., 2005). *Balanced processing* refers to the leader's ability to objectively analyse relevant information/data, including information that contradicts or challenges his/her initial viewpoint (Peus et al., 2011). *Relational transparency* has to do with presenting one's authentic self in interactions with others, openly sharing information and expressing one's true thoughts and feelings in as far as it is appropriate to do so. According to Alok and Israel (2012), these two dimensions (balanced processing and relational transparency) are concerned with leaders' self-regulation, arguing that “authentic leaders have optimal self-esteem and they objectively accept their strengths and weaknesses” (p. 499). Lastly, *internalised moral standards* give a description of how an authentic leader's actions/behaviour are guided by internal moral standards and values; he

will act in accordance with these even against group, organisational or societal pressures (Gardner et al., 2005; Peus et al., 2011).

Alok and Israel's (2012) conception is consistent with the description posited by Walumbwa, Avolio, Gardner, Wernsing, and Peterson (2008); "authentic leadership is a pattern of leader behaviours that draws upon, and promotes both positive psychological capacities and a positive ethical climate to foster greater self-awareness, an internalized moral perspective, balanced processing of information, and relational transparency on the part of leaders working with followers, to foster positive self-development" (p. 94).

Though the mining industry is considered notorious for being a difficult environment within which to achieve positive outcomes, such as psychological empowerment, psychological ownership and safety consciousness leading to safe work attitudes/behaviours (Mclaggan, Bezuidenhout, & Botha, 2013), authentic leadership is seen to have a positive effect on the organisational climate which fosters these positive outcomes (Charalabidis & Koussouris, 2012). Authentic leadership is a form of positive leadership that can leverage diverse strengths and capabilities through positive and empowering leadership behaviours, facilitating individual and organisational growth and development (Albrecht & Andreetta, 2010; Bester, Stander, & Van Zyl, 2015; MacPhee et al., 2014; Nel, Stander, & Latif, 2015; Youssef & Luthans, 2012).

According to Nel, Stander, & Latif (2015), the perceived positive behaviour displayed by authentic leaders is significantly positively related to psychological empowerment, a result supported by other research (Kark, Shamir, & Chen 2003; Seibert et al., 2011; Stander & Rothmann, 2010). Nel et al. (2015) describe positive leadership, of which authentic leadership is a part, as having the ability to match employees' strengths and talents to tasks. Furthermore, it regularly recognises accomplishments, all of which increase employees' feeling of meaning towards their work, also creating an awareness of their competence in performing their work (Emuwa, 2013; Spreitzer, 1995, 2007); the perceptions of "impact over what happens in their work environment; and their ability to decide how their work is done" (Mishra & Spreitzer, 1998; Quinn & Spreitzer, 1997). All of these are consistent with the four dimensions comprising psychological empowerment.

In their study on two types of health care employees, namely clinical care providers and nonclinical care providers, Wong and Cummings (2009) found that authentic leadership in

management is a prerequisite for staff to be psychologically empowered; a view supported by Wong and Laschinger (2013). It was found that psychological empowerment in terms of competence, impact, meaning, and self-determination was related to authentic leadership (Laschinger, Wong, & Grau, 2013; Weichun, 2008). Shapira-Lishchinsky and Tsemach (2014) also found a positive relationship between teachers' perceptions of their principals as authentic leaders and their experiences of empowerment and psychological empowerment.

Psychological Empowerment

Empowerment comprises a self-directed element of personal causation; this is the experience and not just the perception of personally causing something, originating from one's own actions and controlling elements in one's environment (DeCharms, 2013; Shekailo, 2000; Spreitzer, 1995).

Being among the first to employ a motivational approach in the conceptualisation of empowerment as a psychological motivation in the work context, Conger and Kanungo (1988) posit that psychological empowerment is the process of enhancing employees' feelings of efficacy. Thomas and Velthouse (1990) assert that 'to empower' means to give power to someone, which suggests that the one giving power is in possession of power or in a position of power (a leader). According to Conger and Kanungo (1988), this is done by identifying organisational conditions which foster feelings of powerlessness and low levels of efficacy, and eliminating them through formal organisational processes and informal systems of providing efficacy information to employees. Stander and Rothmann (2010) supported this view by describing empowerment as the identification and subsequent eradication of disempowering conditions, by providing efficacy information which in turn leads to positive employee self-efficacy.

Empowerment can relate to both external and internal processes, as it can be the external act of empowering others or the internal experience/feeling of being empowered (Shapira-Lishchinsky & Tsemach, 2014). Building upon the work of Conger and Kanungo (1988), Thomas and Velthouse (1990) took it a step further, viewing empowerment more as energy, and not merely as power, authority or capacity. Empowerment transcends the mere sharing of authority, giving more control over the environment or promoting efficacy. It is about inspiring an experience of intrinsic task motivation on the part of the employee/follower; thus, psychologically empowering the employee (Bester et al., 2015).

Spreitzer (1995) argued that “psychological empowerment is a motivational construct that is manifested in four cognitions, namely *meaning*, *competence*, *self-determination* and *impact*” (p. 1444). Together, these cognitions reflect an active orientation to a work role - this is an orientation in which the individual wishes/feels able to shape his/her work role and context. Mishra and Spreitzer (1998) in their definition of psychological empowerment refer to the employees’ “personal sense of control within the workplace” (p. 577).

In support, Conger and Kanungo (2000) assert that psychological empowerment is a motivational construct, defined as a process of enhancing in others (organisational members) a feeling of efficacy through formal and informal channels; this is consistent with suggestions made by Conger and Kanungo earlier in their 1988 study (Spreitzer, 1995). Menon (2001) conceptualises psychological empowerment as being characterised by perceptions of control, competence and goal internalisation; similar to the four dimensions suggested by Spreitzer (1995).

According to Spreitzer, the four dimensions of psychological empowerment are as follows (Shapira-Lishchinsky & Tsemach, 2014; Spreitzer, 1995): *Meaning* refers to one’s subjective assessment of the work/job as being important or valued; one cares about what one is doing (Spreitzer, 1995). *Competence* is defined as employees’ belief that they possess the necessary skills to successfully perform skill-related tasks; it refers to a sense of efficacy in skilfully performing the job (Emuwa, 2013; Mishra & Spreitzer, 1998; Spreitzer, 2007). *Self-determination* represents the autonomy and freedom to choose how to undertake work tasks/actions (Quinn & Spreitzer, 1997; Spreitzer, 1995). Lastly, *impact* is the degree to which employees feel that their efforts/achievements make a difference; also the level of influence they believe they have over outcomes in the work environment, with others listening to them (Mishra & Spreitzer, 1998; Shapira-Lishchinsky & Tsemach, 2014; Spreitzer, 1995).

Spreitzer (1995) argues that the four dimensions combine additively to create psychological empowerment, with the lack of a single dimension resulting in a deflation; yet, not experiencing a complete elimination of the overall degree of psychological empowerment. This implies that the four dimensions specify an almost complete/sufficient set of cognitions for understanding psychological empowerment (Spreitzer, 1995, 2007; Thomas & Velthouse, 1990).

According to Schutte (1998), disempowered employees have a poor perception about work, safety and quality, arguing that these poor perceptions result in a lack of commitment and trust, poor safety attitudes and careless safety behaviour which thus lead to poor safety performance; all of which are crucially important in the safety critical mining environment. However, when employees are empowered through an increased safety knowledge base as decentralised decision makers, they will demonstrate positive organisational behaviours (de Koster, Stam, & Balk, 2011).

When people are psychologically empowered, this positively impacts their attitudes, thinking and behaviours, which then translate into positive value orientation, patriotic actions, positive organisational behaviours, delayed gratification, self-esteem, self-efficacy, self-consciousness and overall psychological well-being (Oladipo, 2009). In support, Stander and Rothmann (2010) posited that psychological empowerment has a positive influence on employees' sense of control which translates into the motivation to fully engage with their work; thus, positive outcomes on both managerial and organisational levels. The psychologically empowering nature of authentic leaders creates a sense of ownership among employees which then translates into positive organisational behaviours on the part of the psychologically empowered employee (Brouer, Coleman-Gallagher, Sablinski, & Wheeler, 2007).

According to Taktaz, Shabaani, Kheyri, and Rahemipour (2012), psychological empowerment occurs when the power transcends from the upper level to the lower level, resulting in employees experiencing a sense of control and ownership. Pierce et al. (2001) stated that there are three routes through which psychological ownership emerges, one of which is control; thus, implying the sense of control over work which is experienced by psychologically empowered employees (Spreitzer, 1995) could possibly give rise to employee experiences of psychological ownership.

A strong relationship is found to exist between control over work and the construct of possession/ownership (Spector et al., 2002; Wang, Bowling, & Eschleman, 2010). A psychologically empowered workplace creates conditions necessary for employees to experience autonomy and control which are fundamental to psychological ownership (Stander & Rothmann, 2010).

Psychological Ownership

Studies in the field of organisational behaviour have for a long time been concerned with factors that promote employee well-being, performance, discretionary effort, innovation and retention, leading to a research focus on ways in which employees feel related to or psychologically attached to the organisation or their work (Dawkins, Tian, Newman, & Martin, 2015). Evolving from broader studies on the psychology of “MINE”, possession and property, was the rise of the construct of psychological ownership (Pierce, Kostova, & Dirks, 2001). Researchers have noted an employee-organisation relationship where the employee feels devoted to a company with the dedication of a partner or an owner having a stake in the success of the company, with a strong drive towards contributing to the organisation’s improvement (Asatryan, 2006; Shoemaker & Lewis, 1999). This employee-organisation relationship is reflected in the psychological experience of a connection or an emotional bond between the employee and the workplace/organisation, often resulting in psychological and behavioural effects.

The concept of psychological ownership was first theorised by Pierce, Rubenfeld, and Morgan in 1991. Ownership within an organisational context was initially studied as a formal type of ownership, placing emphasis on legal ownership, such as employee share options and employee-owned companies (Campbell-Pickford, Joy, & Roll, 2016). Though legal ownership is acknowledged or even conferred by others external to the self, psychological ownership on the other hand stems from an inward feeling of responsibility/accountability, or personal investment of time or effort on the part of the individual, leading to perceptions of ownership (Dawkins et al., 2017). According to Pierce, Kostova, and Dirks (2001), psychological ownership is “that state in which individuals feel as though the target of ownership (material or immaterial in nature) or a piece of it is theirs” (p. 299). Pierce and colleagues are of the assertion that the psychological ownership construct comprises both cognitive and affective elements. An example of this is found in statements such as “He is my son”; this statement includes both affective and cognitive information, which, according to Van Dyne and Pierce (2004), is based on affective judgements as well as abstract beliefs. Pierce et al. (2001) conceptualise the psychological ownership construct as comprising three dimensions, namely self-efficacy, self-identity and belongingness.

Self-efficacy refers to an individual’s beliefs and/or confidence in his/her ability and skill to successfully complete a task (Bandura, 1995). It is argued by Furby (1978) that a sense of

control plays an important role in one's experiences of self-efficacy beliefs. He posits that if one perceives him/herself as being able to control and affect a desirable outcome, then this is the psychological component that results in feelings of self-efficacy and thus the promotion of psychological ownership.

Self-identity refers to the personal cognitive connection with the target of ownership on the part of the individual. This is the feeling by the individual that the target or object (the organisation/job/work) is an extension of him/herself (Olckers, 2017; Olckers, & Enslin, 2016). According to Olckers (2017), human beings find comfort, pleasure, autonomy and opportunity through their interactions with their possessions; all of which create the conditions necessary for the development of their identity.

Belongingness is concerned with the basic human need to belong and have a place/space one can call home (Weil, 1952). To meet this need, individuals will direct their feelings of possession towards an object/place which then leads to the target of ownership becoming home (Pierce et al., 2001). Within the context of the organisation, belongingness refers to the employee's feelings of being at home within the workplace and the extent to which he/she experiences these feelings (Olckers & Enslin, 2016). According to Avey, Avolio, Crossley, and Luthans (2009), individuals who experience a sense of ownership at work tend to be more positive, reporting that they have a place in the organisation where they feel they belong.

Avey et al. (2009) expanded on the work of Pierce and colleagues (2001) by categorising the dimensions of psychological ownership into either *promotion* or *prevention*-oriented. They also include the concepts of territoriality and accountability as additional dimensions of psychological ownership. According to Avey and colleagues, promotion-oriented psychological ownership consists of four dimensions, namely self-efficacy, a sense of belongingness, self-identity with the target, and accountability. Prevention-oriented psychological ownership comprises only one dimension, namely territoriality.

Alok and Israel (2012) describe preventative-orientation as being concerned with what to avoid for reducing punishment and meeting duties/obligations, while promotion-oriented psychological ownership focuses on what needs to be done to promote hope and aspirations. Preventive-orientation manifests in territorial behaviours with the individual protecting any influence/control over the target of ownership. Promotion-focused psychological ownership

on the other hand displays a sense of belongingness, the desire to be held and to hold others accountable, defining oneself through what one owns and a self-belief about one's capability to influence the environment (Alok & Israel, 2012).

The first three dimensions under *promotion-oriented* psychological ownership are the same as those proposed by Pierce et al. (2001). However, Avey et al. (2009) describe the last dimension, *accountability*, as the individual's implicit or explicit expectation of the perceived right to hold him/herself and others accountable for influences on his/her target of ownership. It is the acceptance of responsibility and being voluntarily transparent and answerable. As a result of increased feelings of psychological ownership, individuals will act as the conscience of others, calling them to account for influences on their target of ownership (Pierce et al., 2001).

Given the ubiquitous nature of feelings of possession, it is important to consider that psychological ownership may occur in relation to a wide range of different organisational targets, which may include things such as the organisation itself, the job, work tasks, the work space, work tools or equipment, ideas or suggestions, team members, work safety and safe work behaviour (Keitner & Kinicki, 2010; Rudmin & Berry, 1987; Van Dyne & Pierce, 2004). Different targets of ownership can vary in salience, depending on the individual and the situation; it is thus important to note that for the purpose of this study the focus is on psychological ownership for the organisation.

Affective Events Theory (Weiss & Cropanzano, 1996) proposes that different attitudes have different mixes or relative proportions of affective cognitive elements. Van Dyne and Pierce (2004) propose that psychological ownership differs from other work-related attitudes and has unique explanatory power owing to its conceptual core in feelings of possession that trigger affect-driven behaviours. They extended this argument by comparing psychological ownership to commitment and satisfaction, emphasising that psychological ownership asks "How much do I feel this organisation is mine?" (Van Dyne & Pierce, 2004). Commitment, on the other hand, asks "Should I maintain my membership in this organisation?"; satisfaction asks "What evaluative judgements do I make about my job?", making possession the distinguishing factor in psychological ownership (Avey et al., 2009). In their development of the psychological ownership measure, Van Dyne and Pierce (2004) place particular emphasis on possession as the basis of the attitudinal measure, using possessive vocabulary, such as "That idea was MINE", "This is MY office", and "She is OUR daughter!"

According to O'Reilly (2002), employees who experience high levels of psychological ownership tend to continually and consistently take responsibility for decisions that promote the best interest of the organisation. With safety being in the best interest of all stakeholders within the mining industry, it is likely that, based on the assertions made by O'Reilly (2002), those employees who experience psychological ownership will strive towards safe work behaviours and the promotion of overall safety within the organisation. This is supported by Curcuruto (2016) who argued that psychological ownership leads to a general proactive orientation by individuals toward the prevention of accidents and the management of safety in the workplace.

Safety Consciousness

Previous studies emphasised implementing safety enhancing systems (i.e. hazard reducing systems; HRS) as being critical for operational safety (de Koster et al., 2011; Vincent et al., 2004; Wallace & Vodanovich, 2003), with organisational leaders being primarily responsible for implementing such systems (La Porte, 1996). Mohamed ElBaradei, director general at the International Nuclear Safety Advisory Group, asserts that whilst having engineered safeguards and formal management systems to control risks are essential, it is equally important to win the commitment of the workforce to treat safety as a priority through a genuine corporate commitment towards achieving high levels of safety (International Nuclear Safety Advisory Group, 2002).

Safety consciousness is conceptually different from other safety-related concepts, such as safety commitment, safety culture, safety climate and safety environment, all of which examine organisational or departmental level aspects of safety. In contrast, safety consciousness is examined at an individual level across work and non-work contexts (Westabya & Lee, 2003).

Safety consciousness, according to Barling, Loughlin, Kelloway (2002), refers to an "individual's own awareness of safety issues" (p. 489). Westabya and Lee (2003) conceptualise safety consciousness as the positive attitude and awareness towards not only safety issues, but also *acting/behaving* safely in general. This alludes to the fact that safety consciousness is safety awareness at both cognitive and behavioural levels. At cognitive level, safety consciousness is being mentally aware of safety within one's work environment and what behaviours foster organisational safety. At the behavioural level, safety

consciousness refers to the enactment of those behaviours that foster operational safety (de Koster et al., 2011).

Safety consciousness is related to values, attitudes and beliefs that underlie the awareness of potential safety hazards and the ability to deal effectively with dangerous situations (Forcier, Walters, Brasher, & Jones, 2001). Individuals, however, differ in relation to their values, attitudes and beliefs, meaning that individuals will also differ in their probability of being involved in workplace accidents as a result of these. Another key differentiator between safety conscious individuals and those lacking safety consciousness is locus of control. Safety conscious individuals are characterised as having an internal locus of control regarding matters of safety. They believe that the consequences of their actions and other life events, including workplace safety, are controlled and created by their own efforts (Forcier et al., 2001; Stocks, April, & Lynton, 2012). Individuals with an external locus of control - in contrast - attribute the consequences of their actions/behaviour to fate and chance. They, in other words, view themselves as having no direct influence on their environment, including their own safety and that of their fellow employees (Stocks et al., 2012). The attitudes that inform the behaviours of employees are critical in safety critical environments, as one cannot afford to leave things up to chance/fate.

According to Forcier and colleagues (2001), safety conscious individuals will generally avoid sensation-seeking behaviours and any unnecessary risk taking that could lead to accidents or injury. They have a preference for structure and are thus likely to follow safety protocols; it is due to their inclination to structure, that they are less likely to succumb to boredom in this highly structured environment. Boredom presents risks which could lead to lapses in concentration and eventually accidents (Forcier et al., 2001).

Though highly structured, with organised operational processes and procedures that are meant to create flow and ease of work, the South African gold mining industry can be quite a stressful environment regarding physical demands, high temperatures and the drive towards steep production targets (Chamber of Mines South Africa, 2018). (Chamber of Mines South Africa, 2018). It is during these periods of heightened pressure that stress levels rise and the employee is required to work faster than usual, whilst paying attention to additional and contrasting demands. Those individuals with a low tolerance for stress are likely to react negatively during these periods of pressure as a result of anxiety and confusion, resulting in serious mistakes that lead to safety-related incidents. In contrast, those with a higher

tolerance for stress are likely to recover quickly from the peak job demands as they are able to maintain composure and remain focused in times of heightened pressure (Schaufeli & Taris, 2014). It is these employees, Stuhlmacher and Cellar (2001) regard as likely to be safety conscious. Research, however, suggests that the positive environment created by authentic leaders may be enough to buffer the effects of the stressful working environment; thus promoting safety consciousness among employees.

Data from empirical studies suggest that active forms of positive leadership (Bass, 1985) have a positive relationship with a variety of employee safety-related outcomes, including employee perceptions of safety climate and safety consciousness (e.g., Barling et al., 2002; Kelloway et al., 2006; Mullen & Kelloway, 2009; Zohar, 2002a). The opposite is true for uninvolved/passive leadership styles, including laissez-faire, as they are shown to be the most ineffective forms of leadership and are associated with decreased business-unit performance as well as negative safety outcomes (Mullena, Kellowayb, & Teed, 2011).

Literature on leadership shows that self-reported safety events and injuries are significantly influenced by a manager's leadership style and by employees' safety consciousness (Barling et al., 2002; Kelloway et al., 2006). The researcher is of the view that authentic leaders create work environments that are psychologically empowering with regard to safety awareness and risk avoidance. Results from Westaby and Lee's (2003) study suggest that empowerment through participation in safety activities was positively associated with safety knowledge and safety consciousness. Through their emphasis on safety as a value, they manifest idealised influence and encourage intellectual stimulation by challenging employees to think about new ways towards improving safety; thus raising employee safety consciousness (Barling, Loughlin, & Kelloway, 2002; Unnikrishnan, Iqbal, Singh, & Nimkar, 2015).

Authentic Leadership, Psychological Empowerment, Psychological Ownership and Safety Consciousness

According to previous research (Saif Gill, Nisar, Azeem, & Nadeem, 2017; Shapira-Lishchinsky & Tsemach, 2014; Wong & Cummings, 2009), authentic leadership and psychological empowerment are positively correlated. It is also stated that subordinates who experience their leaders as promoting a more participative working environment in which information is shared - which are two of the observable characteristics of authentic leaders - indicate greater levels of psychological empowerment (Saif Gill et al., 2017). When

employees experience self-determination and impact that come with being psychologically empowered, they are more likely to hold attitudes and behave in a manner that promotes positive organisational outcomes. A strong relationship also exists between control over work, a dimension of psychological empowerment, and the construct of possession/ownership (Spector, 1986). A psychologically empowered workplace creates conditions necessary for employees to experience autonomy and control as stated by Stander and Rothmann (2010), which is fundamental to psychological ownership. According to O'Reilly (2002), psychological ownership refers to employees' feeling that they are obligated to continually and consistently take responsibility for decisions that promote the best interest of the organisation which, in the context of South African mining, is safe production. Psychological ownership will thus lead to a general proactive orientation by individuals toward the management of safety and the prevention of accidents in the workplace (Curcuruto, 2016). Safety-oriented authentic leadership is a key driver of safety performance in the mining environment as it not only enhances employees' awareness of safety issues, but also their safety consciousness (Barling et al., 2002). Safety-oriented authentic leadership and safety-related work procedures drive worker safety consciousness significantly, which in turn positively impacts safety performance (de Koster et al., 2011).

Authentic leaders, by focusing on the importance of safety and creating an empowering workplace, manifest idealised influence and encourage the intellectual stimulation necessary for empowerment to be engrained; challenging employees to think about new ways to improve safety, and thus raising employee safety consciousness (Barling, et al., 2002; Unnikrishnan, et al., 2015).

Based on the outline above and empirical work/studies that had been conducted, the following hypotheses were formulated:

H1: There is a positive relationship between authentic leadership, psychological empowerment, psychological ownership, and safety consciousness.

H2: Authentic leadership, psychological empowerment, and psychological ownership predict safety consciousness.

H3: Psychological empowerment mediates the relationship between authentic leadership and psychological ownership.

H4: Psychological empowerment mediates the relationship between authentic leadership and safety consciousness.

H5: Psychological ownership mediates the relationship between authentic leadership and safety consciousness.

Below is the proposed model based on the abovementioned hypotheses.

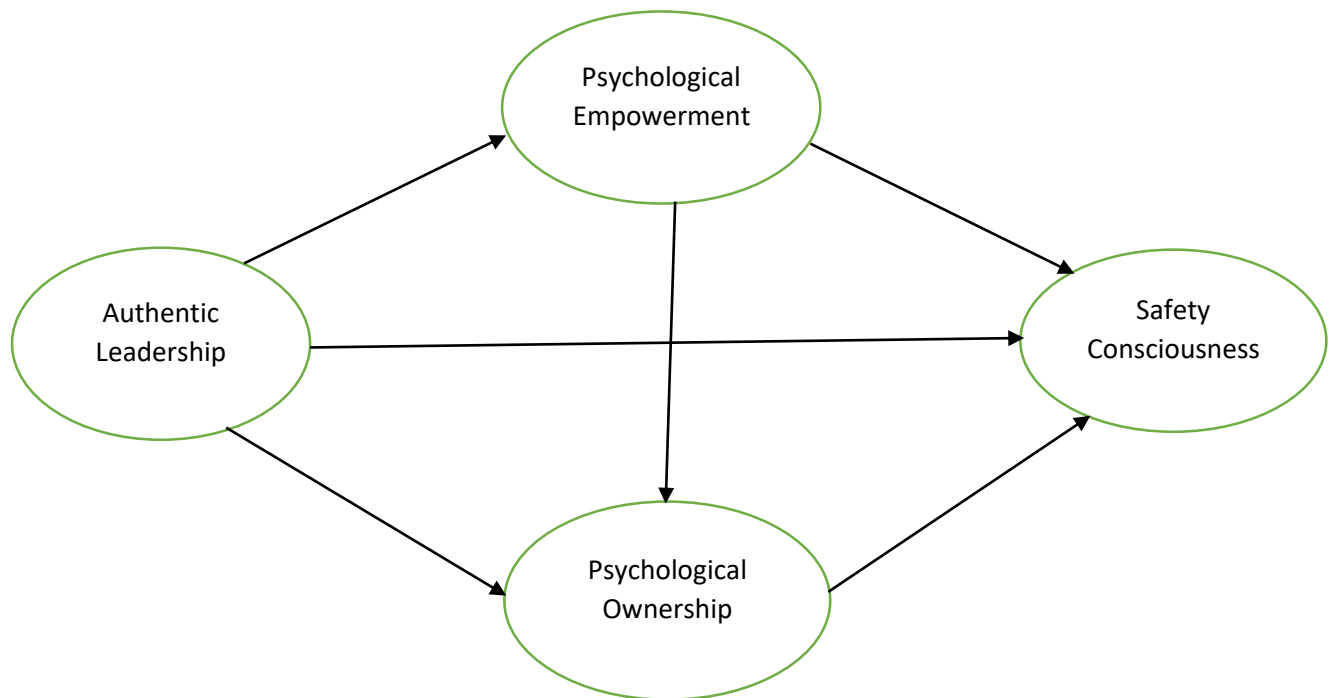


Figure 1. A hypothesised model of authentic leadership, psychological empowerment, psychological ownership and safety consciousness.

RESEARCH METHOD

Participants

A cross-sectional survey research design was conducted amongst supervisory level employees working at a mine in the Free State province of South Africa. A census sampling method was employed; this approach aims to include the entire population. A total of 360 questionnaires were disseminated, of which 283 were satisfactorily completed (response rate 79%).

The demographics of the sample are provided in Table 1 below, followed by the professional characteristics of the sample in Table 2.

Table 1

Characteristics of the Participants

Item	Category	Frequency	Percentage (%)
Gender	Male	224	79.2
	Female	59	20.8
	Missing	–	–
Cultural group	Black	186	65.7
	White	84	29.7
	Coloured	11	3.9
	Indian	–	–
	Other	2	0.7
	Missing	–	–
Age group	18-25	18	6.4
	26-35	58	20.5
	36-45	78	27.6
	46-55	97	34.3
	56-65	32	11.3
	Missing	–	–
Home language	English	13	4.6
	Afrikaans	78	27.6
	Setswana	14	4.9
	isiXhosa	40	14.1
	Xitsonga	11	3.9
	isiZulu	13	4.6
	Sesotho	97	34.3
	Tshivenda	4	1.4
	isiSwati	2	0.7
	Sepedi	5	1.8
	Other	6	2.1
	Missing	–	–

As can be seen in Table 1, most of the respondents were male (79.2%), whilst more than half of the participants were Black (65.7%), with 29.7% being White. This corresponded well with the company's overall demographic profile. The majority (34.3%) of participants were between the ages of 46-55, followed by those aged 36-45 (27.6%). The majority of the participants speak Sesotho (34.3%) as their home language, with isiSwati being the least (.7%) represented language.

The study sample consisted of managers/supervisors, as most studies on followers' perceptions of their leaders usually focus on lower level employees. Another reason for this sample was literacy levels, as many of the lower level employees in the South African mining industry are not proficient in English. Each of the supervisors/managers had an immediate supervisor/manager to whom they reported.

The professional characteristics of the participants are provided in Table 2 that follows.

Table 2

Professional Characteristics of the Participants

Item	Category	Frequency	Percentage (%)
Qualifications	Up to Grade 11	61	21.6
	Grade 12	134	47.3
	NQF 4	27	9.5
	Diploma	39	13.8
	Bachelor's Degree	17	6.0
	Postgraduate Degree+	5	1.8
Department	Engineering	47	16.6
	Development	18	6.4
	Mining	144	50.9
	Financial	7	2.5
	HR	26	9.2
	Other	40	14.1
Level	B1-B5	29	10.2
	C1-C5	224	79.2
	D1-D5	23	8.1
	E1-E2	7	2.5
Years of service	1-5 years	54	19.1
	6-10 years	48	17.0
	11-15 years	37	13.1
	16-20 years	21	7.4
	21-25 years	40	14.1
	26 years and more	83	29.3

Based on Table 2, the majority of the participants had Grade 12 (47.3%) as highest qualification, while 21.6% had qualifications of up to Grade 11. More than half of the respondents (50.9%) are from the mining department and a further 16.6% from the engineering department. A total of 79.2% of the participants were employed at C1-C5 level

(level C decisions involve determining the means or process of achieving the objectives, standards or guidelines established by higher Bands, routine decisions - skilled workers) and 10.2% at the B1-B5 level (level B automatic decisions - semi-skilled workers, focus on how to carry out the process indicated by level C and are required to complete the tasks within the limits set by the specified process; they do, however, have a choice as to how and when the operations are carried out). Table 2 indicates that 29.3% of the participants had been with the company 26 years and more, while 19.1% had only been with the company 5 years or less.

Measuring Instruments

A biographic questionnaire and four measuring instruments, namely the *Authentic Leadership Questionnaire* (ALQ; Walumbwa, Avolio, Gardner, Wernsing, & Peterson, 2008), the *Measuring Empowerment Questionnaire* (MEQ; Spreitzer, 1995), the *Psychological Ownership Measure* (POM; Van Dyne & Pierce, 2004), and *Safety Consciousness Scale* (Barling et al., 2002) were used in the study.

The ALQ was developed in order to assess subordinates' perceptions of their immediate manager/supervisor as being authentic (Walumbwa et al., 2008). It is based on four first-order factors: *Self-awareness*, *balanced processing*, *internalised moral perspective* and *relational transparency*. The ALQ consists of 16-items with responses based on a five-point scale varying from 1 = (strongly disagree) to 5 = (strongly agree). An example item for *self-awareness* is "My leader shows that he/she understands his/her strengths and weaknesses". An example item for *relational transparency* is "My immediate supervisor says exactly what he or she means". An example item for *internalised moral perspective* is "My immediate supervisor makes decisions based on his/her core values" and for *balanced processing*, "My immediate supervisor listens carefully to different points of view before coming to conclusions". Walumbwa et al. (2008) reported internal consistency reliability for each ALQ measure as follows: self-awareness .73; relational transparency .77; internalised moral perspective .73; and balanced processing .70.

The Measuring Empowerment Questionnaire was developed in order to assess subordinates' experiences of being psychologically empowered (Spreitzer, 1995). The questionnaire consists of four subscales, namely *meaning*, *competence*, *self-determination* and *impact*. The MEQ comprises 12 items, with responses based on a five-point scale, varying from 1 = (strongly disagree) to 5 = (strongly agree). An example item for *meaning* is "the work I do is

important to me”; *competence*, “I have the skills to successfully do my job”; *self-determination*, “I have freedom to decide how to do my job”; and *impact*, “I have control over what happens in my section”. Spreitzer (1995) reported reliability for each MEQ measure as follows: meaning .92; competence .89; self-determination .91; and impact .84.

The Psychological Ownership Measure was developed in order to assess subordinates’ experiences of psychological ownership in relation to the organisation they work for (Van Dyne & Pierce, 2004). The psychological ownership measure comprises 7 items with participant responses based on a seven-point scale, varying from 1 = (very strongly disagree) to 7 = (very strongly agree). Example items are “This is MY organisation”, “This is OUR company” and “It’s hard for me to think about this organisation as MINE”. According to Van Dyne and Pierce (2004), the Cronbach’s coefficient alpha showed acceptable internal reliability (0.87, 0.90, and 0.93) in each of the three samples in the original study.

The Safety Consciousness Scale was developed to assess individual levels of safety consciousness (Barling, Loughlin, & Kelloway, 2002). The measure consists of 7 items, with responses based on a five-point Likert-scale varying from 1 = (strongly disagree) to 5 = (strongly agree). Example items are “I am well aware of the safety risks involved in my job” and “I would know what to do if any emergency occurred on my shift”. According to Barling et al. (2004), acceptable internal consistency (.74, and .70) was achieved in each of the two samples in the original study.

Procedure and Ethical Considerations

Ethical clearance was obtained from the Basic and Social Sciences Research Ethics Committee (BaSSREC) of the Vaal Triangle Campus of the North-West University, South Africa (ethics approval number: NWU-HS-2017-0109). Permission was also granted by the management of the target organisation to administer the questionnaire within the company. For the purpose of the initial data collection, an information letter outlining the purpose and objectives of the current study, together with an informed consent form were attached to the self-report questionnaires that were disseminated among the participants. The cover letter explained the purpose of the survey and emphasised that participation was completely voluntary. Confidentiality and anonymity were guaranteed. Participants who agreed to participate in the study completed and submitted the questionnaires in sealed envelopes to

identified employees within the human resource management department or mailed them directly to the researcher. The completed raw data was converted to an SPSS dataset in SPSS 25 (IBM Corporation, 2017) for use in Mplus 8 (Muthén & Muthén, 1998-2017).

Statistical Analysis

For the purpose of investigating hypotheses, structural equation modelling (SEM) was employed using Mplus 8 (Muthén & Muthén, 1998-2017), as it allows for multiple relationships between latent and observed variables to be tested. Confirmatory factor analysis (CFA) was used to test the factorial validity of the measuring instruments (Muthén & Muthén, 1998-2017). Raykov's rho coefficients were employed to assess the reliability of the measuring instruments. Pearson product-moment correlation coefficients were employed to measure the proposed relationships between the study variables.

Mplus 8 makes use of full information maximum likelihood (FIML) estimation when handling missing values. To allow for skewness and kurtosis, a maximum likelihood robust (MLR) estimator was also utilised. The following fit indices were used to interpret data (Hair, Black, Babin, & Andersen, 2010; Kline, 2016; Wang & Wang, 2012), namely chi-square (χ^2), which is the test of absolute fit of the model; degrees of freedom (df); the root mean square error of approximation (RMSEA); the weighted root mean square residual (WRMR); and approximate fit indexes, including comparative fit index (CFI) and Tucker-Lewis index (TLI).

The following cut-off scores were used: RMSEA values closer to 0 are preferable, however, values lower than 0.08 still indicate a fair fit. CFI and TLI values of 1.00 indicate the best fit, while values higher than .95 are considered acceptable (Hu & Bentler, 1999); however, values higher than .90 are commonly accepted in practice (Wang & Wang, 2012).

The study utilised the MLR estimator and as a result the Chi-square values cannot be used to as a basis for comparing the competing models. The Satorra-Bentler Chi-square difference test was therefore conducted in order to calculate the significance in the Chi-square changes among the competing models. (Satorra & Bentler, 2010).

RESULTS

First, the competing measurement models modelling the relationships between authentic leadership, psychological empowerment, psychological ownership and safety consciousness, are reported. Second, the results of the alternative structural models are reported, followed by the results of testing for indirect effects.

Testing Measurement Model

The current study made use of latent variable modelling in Mplus 8 (Muthén & Muthén, 1998-2017) in order to test the hypotheses, resulting in four measurement models. Each measurement model consisted of the same items/observed variables, but varied in structure (Ferres, 2003; Neider & Schriesheim, 2011; Schaufeli, Salanova, Gonzalez-Roma, & Bakker, 2002).

Model 1 consisted of four first-order latent variables, namely authentic leadership (measured by 16 items), psychological empowerment (measured by 12 items), psychological ownership (measured by 7 items) and safety consciousness (measured by 7 items). All latent variables were allowed to correlate.

Model 2 consisted of one latent variable, with all items measuring authentic leadership, psychological empowerment, psychological ownership and safety consciousness loading onto this latent variable. This model was specified in order to test for common method variance. According to Richardson, Simmering, and Sturman (2009), common method variance is “systematic error variance shared among variables measured with and introduced as a function of the same method and/or source” (p. 763); furthermore, it involves variance as a result of scale types, the format of responses and social desirability (Johnson, Rosen, & Djurdjevic, 2011; Malhotra, Schaller, & Patil, 2017; Podsakoff, MacKenzie, Lee, & Podsakoff, 2003).

Model 3 consisted of three first-order latent variables, namely authentic leadership (measured by 16 items), psychological ownership (measured by 7 items) and safety consciousness (measured by 7 items), as well as one second-order latent variable, namely psychological empowerment consisting of meaning (measured by 3 items), competence (measured by 3 items), self-determination (measured by 3 items) and impact (measured by 3 items).

Model 4 consisted of three first-order latent variables, namely authentic leadership (measured by 16 items), psychological ownership (measured by 7 items) and safety consciousness (measured by 7 items). In addition, one second-order latent variable (i.e. psychological empowerment) consisting of two first-order latent variables was specified: meaning and competence were combined into one factor, namely “attitude” (measured by 6 items), and self-determination and impact were combined to form another factor, namely “influence” (measured by 6 items). In their study on psychological empowerment, Hancer, George, and Kim (2005) reported two factors, namely “attitude (meaning and competence) and influence (self-determination and impact)” (p. 670).

Table 3 presents the fit statistics for the four competing measurement models described above.

Table 3

Fit Statistics of Competing Measurement Models

Model	χ^2	<i>p</i>	<i>df</i>	TLI	CFI	RMSEA [90% CI]
1	1920.91*	.00	813	.93	.94	.07 [.07, .07]
2	6191.50*	.00	819	.67	.69	.15 [.15, .16]
3	1567.31*	.00	798	.95	.96	.06 [.05, .06]
4	1642.27*	.00	809	.95	.95	.06 [.06, .07]

Since the survey used during this study consisted of a 5 to 7-point rating scale, the weighted least square (WLSMV) estimator was employed (Muthén & Muthén, 1998-2017), and accordingly, the chi-square (χ^2) values for WLSMV cannot be used for chi-square difference testing in the regular way (i.e. AIC and BIC), as described by Satorra and Bentler (2010). Subsequently, the DIFFTEST option in Mplus 8.0 (Muthén & Muthén, 1998-2017) was used for χ^2 difference testing.

Table 4 below illustrates the testing of the change in χ^2 for the competing measurement model. Results indicate Model 3 fitted the data significantly better than other competing measurement models when conducting the Satorra-Bentler test (Satorra & Bentler, 2010). According to the results, Model 3 shows a statistically significant ($p < 0.001$) χ^2 value of

1567.31($df = 798$). Furthermore, Model 3 indicated acceptable fit: .96, TLI = .95, and RMSEA = .06 (90% confidence interval [CI] [.05, .06]).

Table 4

Difference Testing for Changes in Chi-square in Competing Measurement Models

Model	χ^2	df	p-value
Model 1 vs Model 2	713.25	6	0.00**
Model 3 vs Model 1	209.66	15	0.00**
Model 3 vs Model 2	1296.33	21	0.00**
Model 3 vs Model 4	98.57	11	0.00**

** $p < 0.01$

One of the objectives of the current study was to determine if there indeed is a positive relationship between the study variables (authentic leadership, psychological empowerment, psychological ownership and safety consciousness). The correlation coefficients depicting the relationships between the constructs are reported in Table 5. Due to the use of the WLSMV estimator, tau equivalence was not upheld. Weighted factor loadings were employed and, as a result, point-estimate reliability was utilised (instead of Cronbach alpha), as explained by Raykov (1997), since the assumption that every item contributes the same factor loading (i.e. tau equivalence) was violated. Reliability scores greater than $p = .70$ are significant, and as per the results in Table 5, all the latent variables are well above $p = .70$, ranging from $p = .79$ to $p = .94$, indicating significant reliability (Wang & Wang, 2012).

Hypothesis 1: There is a positive relationship between authentic leadership, psychological empowerment, psychological ownership and safety consciousness.

Correlation is regarded as practically significant to a medium effect ($r \geq .30$) and a large effect ($r \geq .50$). As expected, the four dimensions of psychological empowerment have strong positive relations to a large effect. Meaning is found to be significantly correlated with competence ($r = .77$), self-determination ($r = .61$), and impact ($r = .51$). Competence correlates significantly with self-determination ($r = .75$), and impact ($r = .51$). Self-determination is significantly related to impact ($r = .79$). In addition, authentic leadership

significantly correlates with meaning ($r = .31$), self-determination ($r = .30$), and impact ($r = .40$), and dimensions of psychological empowerment to a medium effect. Results in Table 5 indicate that there is a strong positive relationship between psychological empowerment dimensions, meaning ($r = .56$) and impact ($r = .56$), with psychological ownership to a large effect. Competence ($r = .48$) and self-determination ($r = .43$) dimensions correlated significantly with psychological ownership to a medium effect. Meaning ($r = .49$), competence ($r = .44$) and impact ($r = .38$) dimensions of psychological empowerment correlated significantly with safety consciousness to a medium effect. Psychological ownership was significantly related to safety consciousness ($r = .43$) to a medium effect. Based on the results in Table 5, it becomes apparent that the study variables are positively related to one another; therefore, hypothesis 1 was accepted.

Table 5

Reliability and Correlation Matrix for the Latent Variables

Variable	<i>p</i>	1	2	3	4	5	6	7
1 Authentic leadership	.94	–	–	–	–	–	–	–
2 Meaning	.88	.31*	–	–	–	–	–	–
3 Competence	.79	.27	.77**	–	–	–	–	–
4 Self-determination	.85	.30*	.61**	.75**	–	–	–	–
5 Impact	.90	.40*	.56**	.51**	.79**	–	–	–
6 Psychological ownership	.87	.28	.56**	.48*	.43*	.56**	–	–
7 Safety consciousness	.87	.24	.49*	.44*	.29*	.38*	.43*	–

* Statistically significant ($p \leq .05$); ** statistically significant ($p \leq .01$)

Testing the Structural Model

Measurement model 3 was used as a baseline for testing the structural model in order to investigate hypothesised relationships (Muthén & Muthén, 1998-2017).

Hypothesis 2: *Authentic leadership, psychological empowerment and psychological ownership predict safety consciousness*

Table 6

Standardised Regression Coefficients of Authentic Leadership, Psychological Empowerment, and Psychological Ownership on Safety Consciousness

Variable	Estimate	S.E	Est./S.E.	p
Safety consciousness on				
Authentic leadership	.03	.06	.55	.58
Meaning	.20	.12	1.63	.10
Competence	.38	.19	2.03	.04*
Self-determination	-.46	.20	-2.3	.02*
Impact	.35	.15	2.37	.02*
Psychological ownership	.12	.07	1.92	.06

Note: SE: standard error; Est/SE: estimate divided by standard error; p: obtained significance value * $p < 0.05$;

** $p < 0.01$

The results in Table 6 suggest that authentic leadership did not statistically significantly predict safety consciousness ($\beta = .03$, $p > .05$). In the case of psychological empowerment, the meaning dimension of psychological empowerment did not statistically significantly predict safety consciousness ($\beta = .20$, $p > .05$). The results further indicate that psychological ownership did not statistically significantly predict safety consciousness ($\beta = .12$, $p > .05$). Three of the four dimensions of psychological empowerment, competence ($\beta = .38$, $p = .04^*$), self-determination ($\beta = -.46$, $p = .02^*$), and impact ($\beta = .35$, $p = .02^*$) statistically significantly predicted safety consciousness. Hypothesis 2 was therefore partially accepted.

The current study also endeavoured to investigate the indirect effect that the study variables might have on one another (i.e. the indirect effect of authentic leadership on safety consciousness through psychological empowerment). As such, a mediation analysis was conducted to test the three mediation hypotheses suggested in the study.

Indirect Effects

To investigate the mediating effects proposed in hypotheses 3, 4 and 5, the study tested the mediators (psychological empowerment and psychological ownership) in parallel and in various combinations thereof (Stride, Gardner, Catley, & Thomas, 2015). In order to determine whether authentic leadership indirectly affected psychological ownership through psychological empowerment (i.e. meaning, competence, self-determination and impact), indirect effects were assessed using a procedure suggested by Hayes (2013) as well as Stride et al. (2015). Though Baron and Kenny (1986) suggest certain conditions to be met in order for a variable to be considered a mediator, Hayes (2013) argues that there has been great evolution in 21st century statistics, (i.e. Structural Equation Modelling (SEM)), and that modern day mediation analysis places focus on explicit estimation of indirect effects, inferential tests of indirect effect that don't make unnecessary assumptions, and an acknowledgement that a significant relationship between X and Y is not necessary. Furthermore, the indirect effect of authentic leadership on safety consciousness through the four dimensions of psychological empowerment was tested. Lastly, the indirect effect of authentic leadership on safety consciousness through psychological ownership, utilising the same procedure mentioned above, was tested (Hayes, 2013; Stride et al., 2015). Bootstrapping was used to construct two-sided bias-corrected 95% confidence intervals (CIs) to evaluate indirect effects.

Hypothesis 3: Psychological empowerment mediates the relationship between authentic leadership and psychological ownership.

With regard to the tested indirect effects of authentic leadership on psychological ownership, standard errors, estimates and CIs are presented in Table 7 below. Results in Table 7 indicate that authentic leadership did have a significant indirect effect on psychological ownership through the impact dimension ($\beta = .28, p = .00^{**}, 95\% \text{ CIs } [.15, .48]$) of psychological empowerment. However, authentic leadership did not have an indirect effect on psychological ownership via meaning ($\beta = .02, p > .05, 95\% \text{ CIs } [-.01, .08]$), competence ($\beta = .06, p > .05, 95\% \text{ CIs } [-.2, .19]$), and self-determination ($\beta = .01, p > .05, 95\% \text{ CIs } [-.04, .09]$) dimensions of psychological empowerment. Psychological empowerment is, therefore, a partial mediator of the relationship between authentic leadership and psychological ownership.

A further test was done to ascertain the indirect effect of authentic leadership on psychological ownership through a pairing of the four dimensions of psychological empowerment (meaning and competence, meaning and self-determination, meaning and impact, competence and self-determination, competence and impact, self-determination and impact). The p -values for all six possible pairings were not statistically significant ($p = >.01$) and this was supported by the confidence intervals. This means that authentic leadership did not indirectly influence psychological ownership via any of the paired combinations of the psychological empowerment dimensions mentioned above.

Table 7

Standardised Specific Indirect Effects of Authentic Leadership on Psychological Ownership via Psychological Empowerment (Mediation Analysis 1)

Mediator	Estimate	P	CI 95% BC CI
Meaning	.02	.46	[-.01; .08]
Competence	.06	.27	[-.02; .19]
Self-determination	.01	.68	[-.04; .09]
Impact	.28	.00**	[.15; .48]
Meaning and competence	.04	.15	[.00; .11]
Meaning and self-determination	.00	.74	[-.00; .02]
Meaning and impact	.04	.18	[-.00; .12]
Competence and self-determination	-.01	.74	[-.91; .02]
Competence and impact	-.05	.44	[-.20; .01]
Self-determination and impact	-.16	.12	[-.37; -.02]
Meaning, competence and self-determination	-.01	.67	[-.04; .01]
Meaning, competence and impact	-.03	.26	[-.10; .00]
Meaning, self-determination and impact	-.03	.39	[-.11; .01]
Competence, self-determination and impact	.10	.32	[-.04; .32]
Meaning, competence, self-determination and impact	.07	.16	[-.02; .17]

** $p \leq .01$; BC CI = bias-corrected confidence interval

Furthermore, the indirect effect of authentic leadership on psychological ownership via four combinations that include three of the psychological empowerment dimensions was interrogated, namely (1) meaning, competence and self-determination; (2) meaning, competence and impact; (3) meaning, self-determination and impact; and (4) competence, self-determination and impact. The p -values for all the combinations were not statistically

significant, resulting in ($p = >.01$); this was supported by the confidence intervals. Authentic leadership does not indirectly influence psychological ownership via any of the four combinations of the psychological empowerment dimensions suggested above.

Lastly, the indirect effect of authentic leadership on psychological ownership via all four dimensions at once (meaning, competence, self-determination and impact) was investigated. Once again the p -value was statistically insignificant for all four dimensions together ($p = >.01$) and this was supported by the confidence intervals. This suggests that authentic leadership does not indirectly influence psychological ownership via all four psychological empowerment dimensions at once, as suggested above.

Based on the results in Table 7, psychological empowerment mediates the relationship between authentic leadership and psychological ownership only through the impact dimension of psychological empowerment. Hypothesis 3 was thus partially accepted as authentic leadership only affects psychological ownership via one dimension of psychological empowerment.

Hypothesis 4: Psychological empowerment mediates the relationship between authentic leadership and safety consciousness.

Table 8 below presents standard errors, estimates and CIs for the tested indirect effects of authentic leadership on safety consciousness via psychological empowerment. Based on the results, the current study found authentic leadership to have had no significant indirect effect on safety consciousness through meaning ($\beta = .02, p > .05, 95\% \text{ CIs } [-.01, .10]$), competence ($\beta = .09, p > .05, 95\% \text{ CIs } [.00, .27]$), self-determination ($\beta = .02, p > .05, 95\% \text{ CIs } [-.03, .13]$), and impact ($\beta = .22, p > .05, 95\% \text{ CIs } [.02, .47]$) dimensions of psychological empowerment. The results indicate that authentic leadership did not have an indirect effect on safety consciousness via psychological empowerment or any of its four factors/dimensions.

As with the previous mediation analysis, the study further investigated paired combinations of the psychological empowerment dimensions. Meaning and competence ($\beta = .04, p > .05, 95\% \text{ CIs } [-.04, .10]$); meaning and self-determination ($\beta = .00, p > .05, 95\% \text{ CIs } [-.00, .04]$); meaning and impact ($\beta = .04, p > .05, 95\% \text{ CIs } [-.05, .14]$); competence and self-determination ($\beta = -.02, p > .05, 95\% \text{ CIs } [-.13, .02]$); competence and impact ($\beta = -.08, p >$

.05, 95% CIs [-.32, .00]); and self-determination and impact ($\beta = -.22, p > .05$, 95% CIs [-.52, .02]). Authentic leadership did not indirectly affect safety consciousness through any of the pairings of the psychological empowerment dimensions.

Furthermore, the mediation analysis grouped the four psychological empowerment dimensions into four different combinations of three. The combinations were as follows: (1) meaning, competence and self-determination ($\beta = -.01, p > .05$, 95% CIs [-.05, -.02]); (2) meaning, competence and impact ($\beta = -.03, p > .05$, 95% CIs [-.12, .05]); (3) meaning, self-determination and impact ($\beta = -.02, p > .05$, 95% CIs [-.14, .03]); and (4) competence, self-determination and impact ($\beta = .17, p > .05$, 95% CIs [-.01, .53]). There is no indirect effect on safety consciousness by authentic leadership via any of the above combinations of psychological empowerment dimensions.

Table 8

Standardised Specific Indirect Effects of Authentic Leadership on Safety Consciousness via Psychological Empowerment (Mediation Analysis 2)

Mediator	Estimate	<i>p</i>	CI 95% BC CI
Meaning	.02	.46	[-.01; .10]
Competence	.09	.19	[.00; .27]
Self-determination	.02	.56	[-.03; .13]
Impact	.22	.07	[.02; .47]
Meaning and competence	.04	.34	[-.04; .10]
Meaning and self-determination	.00	.74	[-.00; .04]
Meaning and impact	.04	.42	[-.05; .14]
Competence and self-determination	-.02	.60	[-.13; .02]
Competence and impact	-.08	.32	[-.32; .00]
Self-determination and impact	-.22	.10	[-.52; -.02]
Meaning, competence and self-determination	-.01	.65	[-.05; .01]
Meaning, competence and impact	-.03	.46	[-.12; .05]
Meaning, self-determination and impact	-.02	.58	[-.14; .03]
Competence, self-determination and impact	.17	.21	[-.01; .53]
Meaning, competence, self-determination and impact	.07	.37	[-.12; .19]

** $p \leq .01$; CI = confidence intervals

The mediation analysis continued to test for all four dimension as one, meaning, competence, self-determination and impact ($\beta = .07, p > .05$, 95% CIs [-.12, .19]). The results indicate that authentic leadership had no indirect effect on safety consciousness via a combination of all four dimensions of psychological empowerment. Psychological empowerment, therefore, does not mediate the relationship between authentic leadership and safety consciousness.

Based on these results, Hypothesis 4 was rejected.

Hypothesis 5: *Psychological ownership mediates the relationship between authentic leadership and safety consciousness.*

Table 9 below presents standard errors, estimates and CIs for the indirect effects of authentic leadership on safety consciousness through psychological ownership. Results in Table 8 indicate a significant indirect impact by authentic leadership on safety consciousness via psychological ownership ($\beta = .15$, $p = .00^{**}$; 95% CIs [.09, .23]). Psychological ownership, therefore, fully mediates the relationship between authentic leadership and safety consciousness. The results show support for Hypothesis 5; it was therefore accepted.

Table 9

Standardised Specific Indirect Effects of Authentic Leadership on Safety Consciousness

Mediator	Estimate	P	CI 95%
Psychological ownership	.15	.00**	[.09; .23]

** $p \leq .01$; CI = confidence intervals

DISCUSSION

The aim of this study was to determine the possible relationships and indirect effects between authentic leadership, psychological empowerment, psychological ownership and safety consciousness. The research intended to highlight the positive benefits of authentic leadership for a mining organisation in fostering an environment where employees experience psychological empowerment and psychological ownership; in turn, resulting in heightened overall employee safety consciousness which is key to improving organisational safety performance. This is especially important given the state and nature of mining in South Africa. This industry is facing challenges of a volatile market, a lack of skilled workforce, dissatisfied/unhappy workforce, and difficult working conditions characterised by industrial action, unsafe work practices, and a high number of safety incidents (Chamber of Mines of South Africa, 2018).

Studies (Brouer, Coleman-Gallagher, Sablinski, & Wheeler, 2007; Nel et al., 2015; Stander & Rothmann, 2010) have shown that positive leadership has the ability to align people's strength/talents with tasks, while also giving recognition for accomplishments; and thus increasing the experience of meaning and an awareness of competence on the part of the subordinate. A form of positive leadership - authentic leadership - is seen to leverage diverse strengths by displaying positive and empowering behaviours, leading to positive individual outcomes, including psychological empowerment, psychological ownership and safety consciousness; also positive organisational outcomes, such as positive production and safety performance (Albrecht & Andreetta, 2011; Bester et al., 2015; 2011; MacPhee et al., 2014; Nel et al., 2015; Youssef & Luthans, 2012).

The findings of this study indicate that positive relationships exist among the study variables, authentic leadership, psychological empowerment (impact, meaning, competence and self-determination), psychological ownership and safety consciousness. This implies that increases in one of the study variables above, will likely result in increases in the other variables (i.e. higher levels of authentic leadership are associated with higher levels in the impact dimension of psychological empowerment).

In terms of the relationship between authentic leadership and psychological empowerment (meaning, competence, self-determination and impact), the results of this study indicate a positive relationship with regard to meaning, self-determination and impact dimensions. When employees experience their leaders as being authentic, that is being self-aware, relationally transparent, having an internal moral perspective and balanced processing of data/issues, they regard themselves as being more psychologically empowered (Joo & Jo, 2017). The positive moral and ethical values enacted by authentic leaders, for example honesty, accountability, fairness and altruism, encourage employees to identify with these values. The integrity displayed by and ethical nature of authentic leaders will likely lead them to consider employees' developmental needs and thus position them where their growth (meaning) and confidence/self-efficacy (competence) will be facilitated. Authentic leaders are likely to respect the dignity of their followers, allowing a degree of autonomy (self-determination) and providing opportunities for employees to understand the impact of their work by means of regular feedback (Zhu, May, & Avolio, 2004).

Literature suggests that authentic leadership and psychological empowerment are significantly related (Gill, Nisar, Azeem, & Nadeem, 2017; Shapira-Lishchinsky & Tsemach,

2014; Wong & Cummings, 2009). In addition, employees who perceive their leaders as being authentic are said to describe themselves as independent decision makers who competently carry out their duties (Meyerson & Kline, 2008).

Regarding authentic leadership and psychological ownership, the results indicate that the relationship was not statistically significant. Given the empowering nature of authentic leaders, a positive relationship was expected between authentic leadership and psychological ownership, the result of the current study was thus unexpected. Alok (2014) reported a positive relationship between authentic leadership and psychological ownership. When employees experience their leaders as valuing their inputs, openly sharing information, being open to feedback, being objective in their decision making, and respecting employee needs for autonomy and control, they experience a sense of possession and reciprocate self-conception and responsibility towards the organisation (Vem, Gomam, Nmadu, & Wurim, 2017). An explanation of the results could be that, within the context of South African mining, it is difficult for employees to fully experience their leaders as authentic due to the highly structured and mechanistic nature of the industry (Waddell, Creed, Cummings, & Worley, 2016). Having a vast physical distance between leader and employee can further influence employees' experience of the leader.

Authentic leadership did not have a positive relationship with safety consciousness. The results of this outcome were unexpected, as - based on the theory - one can expect a positive relationship between the constructs. According to de Koster et al. (2011), safety-specific leadership does not only promote, on the part of the employee, awareness of safety-related issues and behaviours, but also models/enacts idealised safety behaviours (i.e. safety consciousness). Authentic leaders within a safety critical environment are likely to place emphasis on safety issues and the knowledge required to deal with safety-related situations; thus, increasing employee safety consciousness. An explanation of the results could be the lack of involvement in safety-related decision making in the South African mining environment, leaving employees isolated from and unable to identify with organisational safety initiatives.

The findings of the current study indicate a positive relationship between psychological empowerment (meaning, competence, self-determination and impact) and psychological ownership. As employees' experience of psychological empowerment increases, their levels of psychological ownership will increase. Due to experiences of greater meaning,

competence, self-determination and impact - fostered by the empowering nature of authentic leaders - employees experience a heightened sense of control over their work/workplace, and that is central to psychological ownership (Liu, Wang, Hui, & Lee, 2012).

In terms of the relationship between psychological empowerment and safety consciousness, the results of the current study indicate a positive relationship. When employees experience psychological empowerment in the form of safety knowledge as decentralised decision makers, their levels of safety consciousness will increase (de Koster et al., 2011). This means that in a safety critical environment employees' levels of safety consciousness will be heightened as a result of experiences of psychological empowerment in relation to their job/workplace.

In the current study, safety consciousness was found to be positively related to psychological ownership. When employees experience heightened psychological feelings of ownership towards their organisation, their level of safety consciousness will increase. This result is consistent with research that suggests that when individuals experience strong feelings of psychological ownership towards the organisation, they will enact stewardship behaviours and endeavour to promote the best interest of the organisation (Alock, 2014; Olckers, 2013). In the case of a mining organisation, safe production is in the best interest of the organisation. Employees, experiencing feelings of psychological ownership towards the mining organisation, will thus have a great deal of awareness regarding safety-related issues. They will endeavour to enact behaviours that promote safety (i.e. safety consciousness) in the course of their daily production duties.

The second hypothesis of the current study proposed that authentic leadership, psychological empowerment and psychological ownership predicted safety consciousness. The results indicated that direct paths exist from competence, self-determination and impact dimensions of psychological empowerment. However, there are no direct paths from the meaning dimension of psychological empowerment; there is no direct path from authentic leadership; and no direct path from psychological ownership. Safety performance is regarded one of the key performance areas in the South African mining industry (Chamber of Mines SA, 2017). Authentic leaders in this environment are likely to place specific emphasis on safety awareness, safety-related training and safety-enhancing behaviour (de Koster et al., 2011).

The results of the current study indicate that when employees experience themselves as possessing the skills, knowledge and competence necessary to safely discharge their work duties, this is likely to influence their safety consciousness. Self-determination has to do with employees' experience of autonomy in relation to the manner in which they work and carry out their work tasks (Shapira-Lishchinsky & Tsemach, 2014). As previously stated, safety in the mining industry is considered a key area of performance and a top priority. According to Shapira-Lishchinsky and Tsemach (2014), when employees experience themselves as empowered decision makers who are autonomous in their actions, they become motivated to improve on performance. In this safety critical context, safety performance will be pursued, and thus a heightened safety consciousness.

Impact has to do with the degree to which followers feel that they can influence the strategic, administrative and operational outcomes in their workplace in a meaningful way (Razaka, Zakariab, & Matc, 2017). When employees feel psychologically empowered, they experience themselves as having a causal effect on organisational outcomes, which Menon (2002) describes as a cognitive state characterised by control, competence and goal internalisation.

With regard to the indirect effect of authentic leadership on psychological ownership via psychological empowerment (i.e. meaning, competence, self-determination and impact), the results confirmed that the indirect effect exists only via the impact dimension of psychological empowerment and not through the other three dimensions. Campbell-Pickford and colleagues (2016) describe psychological ownership as consisting of three roots, namely efficacy, self-identity and belonging. Subsequently, there are "three routes leading to the formation of psychological ownership, namely control, investment of self and intimate knowledge of the target" (Campbell-Pickford et al., 2016, p. 3). Considering the amount of time employees invest at work during a typical work week, it is likely for employees to develop an intimate understanding of the organisation. Spreitzer (1995) describes impact as the extent to which one influences organisational outcomes at strategic, administrative and operational levels. Thus, when employees feel/see that they impact organisational outcomes; the perceived sense of control/impact over organisational outcomes results in feelings of psychological ownership towards the organisation. An explanation of the result could be that the other three dimensions of psychological empowerment might be too closely related to the components of psychological ownership (i.e. self-determination and control, meaning and belonging, competence and self-efficacy).

The results did not confirm the indirect effect of authentic leadership on safety consciousness via psychological empowerment (i.e. meaning, competence, self-determination and impact). This outcome was unexpected, as theory suggests that one could likely expect a positive indirect effect of authentic leadership on safety consciousness via psychological empowerment. de Koster and colleagues (2011) suggested that in safety critical environments, authentic leaders will advocate awareness of safety issues by empowering employees with knowledge on safety-related behaviours (i.e. safety consciousness); also serving as role models by enacting values related to the promotion of safe work practices and, in turn, influencing employee safety consciousness.

In terms of the indirect effect of authentic leadership on safety consciousness via psychological ownership, the results confirmed an indirect effect. That is, authentic leadership will influence safety consciousness when psychological ownership is present. When employees - who experience feelings of ownership towards their organisation - perceive their leaders as portraying themselves in an authentic manner that promotes safety awareness and knowledge of desired safety behaviours, their levels of safety consciousness will increase. Authentic leaders, due to their ethical nature, will focus on the importance of safety, enacting behaviours that promote safety; thus empowering followers as decentralised decision makers regarding safety-related matters (Barling, Loughlin, & Kelloway, 2002; Unnikrishnan, Iqbal, Singh, & Nimkar, 2015). Employees' perceived control is likely to trigger feelings of ownership and responsibility towards promoting the best interests of the organisation; in the case of a mining operation, safety is one of the best interests (Curcuruto, 2016)

Limitations and Future Directions

The study had a number of limitations which should be considered when interpreting the data. First, it is important to note that the study was cross-sectional in nature; data was collected at one point and not over a period of time. This may create potential problems and limit the ability to make causal inferences. Future research can look into how a longitudinal approach may allow for a more in-depth investigation of causal effects.

Second, the study was very context-specific and as a result of leadership being investigated within context, it is difficult to generalise the results of the current study to other contexts without first testing its validity in different contexts. Furthermore, the research was conducted in one mining organisation; therefore, the results may not necessarily be generalised to

different contexts (i.e. other organisations, industries, occupations and regions). Future research can look into diverse organisations and industries, and even make comparisons across different industries.

Third, the use of self-report survey questionnaires was the only data collection method available to the researcher to source information. Due to the fact that this type of survey only considers how the participant views the construct (perception) and might not measure the actual construct content, it raises concerns regarding “common method variance”, and may be regarded a limitation. Future research may employ mixed data collection methods for richer data.

Conclusion

The current study was initiated with the aim of exploring the positive implications of authentic leadership on both individual and organisational outcomes, as well as to create awareness regarding the construct of authentic leadership. Furthermore, this study endeavours to produce knowledge that contributes to the current body of knowledge in leadership/management, positive psychology and to inspire future research, particularly relevant to practice.

The mining industry in South Africa continues facing many challenges, of which workplace safety continues to be fundamental. The industry, together with government, has initiated many interventions, including standardised safety operating procedures and other structural measures. However, it remains the role of leaders to entrench safety as a value into the cultural fibre of the organisation, by not only promoting safety as a value, but by also enacting safety promoting behaviours and serving as idealised role models (de Koster et al., 2011).

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CHAPTER 3

CONCLUSIONS, LIMITATIONS AND RECOMMENDATIONS

Contained in this chapter is the theoretical and empirical conclusions of the study in relation to the set objectives. Discussed are the limitations of the research study, and the recommendations for practice. Furthermore, recommendations and suggestions are made for future research.

3.1 CONCLUSIONS FROM LITERATURE AND EMPIRICAL RESULTS

Though global trends indicate a shift towards a more mechanised approach in mining (Day, 2014; Newell, 2002), the South African mining sector remains very labour intensive and is considered one of the largest employers of unskilled and semi-skilled labourers (International Business Publications, 2014). This presents a myriad of challenges to the sector, including on-going global change, recession, downsizing, productivity and workplace safety. It remains an expectation among stakeholders that organisational leaders provide unique solutions to the challenges faced by the sector, while prioritising “safe-production” (Chamber of Mines, 2017; Hughes, 2010; Solidarity, 2015). Though the mining industry has a negative reputation for being a difficult environment within which to achieve positive outcomes, such as psychological empowerment, psychological ownership and safety consciousness, leading to safe work attitudes/behaviours (Mclaggan, Bezuidenhout, & Botha, 2013), authentic leadership is seen to have a positive effect on organisational climate which fosters these positive outcomes (Charalabidis & Koussouris, 2012). According to Maximo (2015), it is thus crucially “important that organisations continue to engage managers/supervisors in leadership development initiatives in order to address the challenges” (p. 53), faced by the South African mining sector.

The first objective was to conceptualise authentic leadership, psychological empowerment, psychological ownership and safety consciousness according to literature.

Leadership remains one of the most studied topics of our time (Antonakis & Day, 2017; Hogan & Kaiser, 2005; Meindl, Ehrlich, & Dukerich, 1985), with a number of studies having been conducted on the different forms of leadership over the past decades (i.e. Bass &

Avolio, 1993; Engelbrecht, Hein, & Mahembe, 2014; Stone, Russell, & Patterson, 2004). The focus, however, has in recent times shifted towards more positive forms of leadership (Engelbrecht et al., 2014), including authentic leadership. Being of interest to both practitioners and scholars, authentic leadership has received attention in the workplace as well as in academic research (Hsieh & Wang, 2015; Men & Stacks, 2014).

Gardner, Coglisier, Davis, and Dickens (2011) in a review of authentic leadership literature, proclaim the construct of authentic leadership was first conceptualised within an organisational context in the late 1960's. They recognise Henderson and Hoy as being the first to conceptualise leader authenticity, making a distinction between leader authenticity and leader inauthenticity (Gardner et al., 2011). There have been a number of other authors following Henderson and Hoy, who had all made immense contributions towards defining the authentic leadership construct (George, 2003; Ilies, Morgeson, & Nahrgang, 2005; Kernis, 2003; Kernis & Goldman, 2006; Luthans & Avolio, 2003), resulting in four dimensions of authentic leadership, namely “self-awareness, positive self-regulation, positive self-development, and/or a positive moral perspective” (Gardner et al., 2011, p. 4).

However, the definition that is most widely accepted is the one established by Walumbwa, Avolio, Gardner, Wernsing, and Peterson (2008). According to Walumbwa and his colleagues (2008), authentic leadership is the kind of leadership which “draws on positive psychological capacities and positive ethical climate to foster the four core dimensions of authentic leadership, enabling positive follower self-development” (p. 94). Authentic leadership can be summarised by four dimensions as conceptualised by Kernis and Goldman (2006), namely *self-awareness*, which refers to the leader's knowledge of him/herself and the impact he/she has on others (Kernis, 2003; Walumbwa et al., 2008); *balanced processing*, meaning the leader is able to take account of multiple perspectives when making decisions in order to remain objective, though it might challenge his/her own beliefs or feelings (Gardner, Avolio, Luthans, May, & Walumbwa, 2005; Walumbwa et al., 2008); *relational transparency*, where the leader is open and honest in his/her dealings with others by displaying his/her true thoughts and emotions when interacting with others (Kernis, 2003; Walumbwa et al., 2008); and lastly *internalised moral perspective*, referring to the leader's decision making in accordance to his/her core values and beliefs, rather than being externally influenced (Avolio & Gardner, 2005; Gardner et al., 2005; Walumbwa et al., 2008). According to Meyerson and Kline (2008), employees reporting to authentic leaders view

themselves as independent decision makers, which is a significant aspect in employees' psychological empowerment (Gill, Nisar, Azeem, & Nadeem, 2017). Defined as either an outward or an internal process, the term 'empowerment' may refer to the act of empowering others or the internal experience of feeling empowered (Burke, 1986; Menon, 2001; Thomas & Velthouse, 1990; Shapira-Lishchinsky & Tsemach, 2014). Resulting in the many different definitions of psychological empowerment (Conger & Kanungo, 2000; Shapira-Lishchinsky & Tsemach, 2014; Short, Greer, & Melvin, 1994), Spreitzer's (1995) conceptualisation, however, has enjoyed wider acceptance.

Spreitzer (1995) defined psychological empowerment as "a motivational construct which is exhibited by four cognitions" (p. 1444): *meaning*, referring to the value of a work goal in relation to one's own ideals or standards (Thomas & Velthouse, 1990; Spreitzer, 1995); *competence*, an individual's belief in his/her efficacy to skilfully perform tasks (Bandura, 1989; Gist, 1987; Spreitzer, 1995); *self-determination*, a sense of having choice/freedom in initiating and regulating actions, as well as deciding on how work is done (Deci, Connell, & Ryan, 1989; Shapira-Lishchinsky & Tsemach, 2014; Spreitzer, 1995); and *impact*, the extent to which one can influence strategic, administrative or operational outcomes at work (Ashforth, 1989; Spreitzer, 1995). According to Mishra and Spreitzer (1998), psychological empowerment has to do with the sense of control that employees perceive at the workplace; with control being one of the dominant factors in psychological ownership, one can expect some relation between these two constructs.

Psychological ownership was originally studied and defined outside of the organisation and management literature (Campbell-Pickford, Joy, & Roll, 2016), and evolved from broader studies that focused on the psychology of "mine" - possession and property. The psychological ownership construct is, according to Dawkins, Tian, Newman, and Martin (2017), an adaptation of possession and ownership to the organisational context. Pierce, Kostova, and Dirks (2001) are widely credited with being the first to apply the concept of psychological ownership to the work/organisational context. Pierce (2001) and colleagues described psychological ownership as comprising both affective and cognitive elements, for example, statements such as "He is my son" include both affective and cognitive information arising from affective judgements and abstract beliefs (Van Dyne & Pierce, 2003, p. 442). Psychological ownership is defined as a state in which the individual feels as though the organisation/organisational target of ownership is his or hers (Pierce et al., 2003). Though

they might share some common elements, there is a clear distinction between psychological ownership and legal ownership, the latter being upheld by the legal system and recognised by others as legitimate ownership. Psychological ownership is conceptualised as a self-derived perception which is thus primarily recognised by the individual him/herself (Dawkins et al., 2017; Pierce et al., 2003). There is wide consensus among psychological ownership scholars that the construct emerges as a result of satisfying three human motives, namely (1) *efficacy*, a basic human need to feel competent within a given domain (Bandura, 1997); (2) *self-identity*, a personal cognitive connection between an individual and an object or target; reflecting perceptions of oneness, the individual sees the object/target as an extension of the self (Avey et al., 2009; Olckers, 2017); (3) *belongingness* (a sense of place/home), human beings have an innate desire to belong and have a personal area or space. This psychological need can be satisfied through attachment to a place or an object. In an organisational context, belongingness refers to the extent to which the individual feels “at home” in the work place (Olckers, 2013; Campbell-Pickford et al., 2016; Pierce et al., 2003).

According to Campbell-Pickford et al. (2016), psychological ownership is associated with positive behaviours and states, including motivation, stewardship and loyalty. It is for this reason one would assume positive safety-related attitudes from individuals who experience psychological ownership in safety critical environments such as mining, leading to higher levels of safety consciousness.

Described by Barling, Kelloway, and Loughlin (2002) as “an individual’s own awareness of safety issues” (p. 489), safety consciousness occurs at both a cognitive and a behavioural level. At a cognitive level, safety consciousness has to do with a mental awareness of safety in ones work/workplace and an understanding of which behaviours will foster operational safety (Barling et al., 2002; de Koster, Stam, & Balk, 2011). From a behavioural level, safety consciousness transcends the mere awareness of safety issues and knowing which behaviours foster operational safety; yet, it is more about enacting those behaviours that foster operational safety (Barling et al., 2002; de Koster et al., 2011). Westaby and Lee (2003) defined safety consciousness as “a positive attitude and awareness toward acting safely in general” (p. 228). In its conceptualisation, safety consciousness is distinctly different from other safety-related constructs, which may include safety climate and safety environment, these examine organisational or departmental aspects of safety (Barling et al., 2002; Hofmann

& Morgeson, 1999; Westaby & Lee, 2003). Safety consciousness, on the other hand, focuses on the individual level.

The second objective was to investigate the relationship between authentic leadership, psychological empowerment, psychological ownership and safety consciousness according to literature.

The relationship between authentic leadership and psychological empowerment has been studied by a number of scholars (Gill et al., 2017; Shapira-Lishchinsky & Tsemach, 2014; Marič, Miglič, & Jordan, 2017; Meyerson & Kline, 2008; Weichun, 2008; Wong & Cummings, 2009; Zhu, May, & Avolio, 2004). According to Meyerson and Kline (2008), individuals who are managed or supervised by authentic leaders regard themselves as independent decision makers; an element which is linked to the self-determination dimension of psychological empowerment. In their study, Shapira-Lishchinsky and Tsemach (2014) found a significant positive relation between authentic leadership and psychological empowerment. In support, Wong and Cummings (2009) advocated that authentic leadership is crucial for the psychological empowerment of staff. A study by Weichun (2008) found that psychological empowerment - in terms of all four of its dimensions - was related to authentic leadership, specifically the aspect of internalised moral perspective.

Grounded upon the logical assumption that psychologically empowered employees will be motivated to positively contribute to the best interest of the organisation (Organ, 1988; Shapira-Lishchinsky and Tsemach, 2014), one can anticipate a positive relation between psychological empowerment and psychological ownership. Psychological ownership is driven by three basic human needs, one of which is *efficacy*, described as a basic human need to feel competent within a given domain (Bandura, 1997). Having strong links to one of the dominant components of psychological empowerment which refers to an individual's belief in his/her efficacy to skilfully perform tasks (Bandura, 1989; Gist; 1987; Campbell-Pickford et al., 2016; Pierce et al., 2001; Spreitzer, 1995), it is likely that a positive relationship will exist between psychological empowerment and psychological ownership. Campbell-Pickford and colleagues (2016) argue that a feeling of competence, resulting from psychological empowerment, can foster psychological ownership. They argue that having autonomy; responsibility; and the ability to influence strategic, job design, operational and administrative outcomes - all of which are a result of psychologically empowering authentic

leaders; can foster psychological ownership. Authentic leadership has been found by Alok (2014) to be positively related to followers' promotive psychological ownership towards the organisations they work for, a finding that is accepted and shared by Vem, Gomam, Nmadu, and Wurim (2017). Furthermore, Vem et al. (2017) argued that based on attributes such as balanced processing, rational transparency, internalised moral perspective and self-awareness, all of which characterise authentic leadership (Spence, Wong, & Grau, 2012; Laschinger, Wong, & Grau, 2013; Walumbwa et al., 2008; Kernis, 2003), authentic leadership is likely to positively influence psychological ownership.

As a result of feeling valued, informed, involved and trusted, employees reporting to authentic leaders are expected to experience a sense of possession, self-conception and responsibility towards the organisation, as a reciprocal gesture (Mustafa, Martin, & Hughes, 2016; Song Lin, Lamond, Pan, Qin, & Gao, 2014; Vem et al., 2017). Vem et al. (2017) found a positively significant relationship between authentic leadership and psychological ownership, explaining 13.9% variance. Individuals experiencing psychological ownership are found to have a sense of responsibility or accountability for the success of the target of ownership, in this case the organisation; thus, resulting in personal investment of time and effort towards ensuring this (Dawkins et al., 2017; Campbell-Pickford et al., 2016). As such, one can assume that within a safety critical environment such as mining, employees experiencing psychological ownership towards the organisation are likely to not only possess a heightened awareness of safety-related issues and the behaviours that foster safety performance, but they will also enact these behaviours and advocate them (Barling et al., 2002; de Koster et al., 2011).

According to de Koster et al. (2011), it is not enough for leaders just to implement safety enhancing systems, but their "leadership behaviour towards their subordinates is also of critical importance for safety performance. Safety-oriented leadership (i.e. safety specific authentic leadership) is a key driver of safety performance... because it enhances employees' awareness of safety issues" (p. 754); thus, empowering employees to deal decisively with safety-related issues. Key elements of the definition include safety consciousness, awareness of safety issues and enacting behaviours that foster safety. In support, research indicates that leadership style and employee safety consciousness significantly influence employee's inclination towards self-reported safety events and injuries (Barling et al., 2002; Kelloway et al., 2006).

The third objective was to determine if there is a relationship between authentic leadership, psychological empowerment, psychological ownership, and safety consciousness among supervisors at a South African mine.

The results of the current study found that a strong positive relationship of large effect exists between psychological ownership and psychological empowerment dimensions - meaning and impact. This implies that if psychological empowerment is present, with specific reference to the meaning and impact dimensions, employees will develop positive feelings of psychological ownership towards their organisation (Alok, 2014). Additionally, authentic leadership and psychological empowerment dimensions meaning, self-determination, and impact are positively related with medium effect. When employees experience their leaders as being authentic, in as far as honestly representing their true selves/values, considering different opinions/information when making decisions, allowing subordinates to voice their opinions as well as affording them the autonomy to make decisions that impact their work, subordinates will experience their work environment as being psychologically empowering (Gill et al., 2017).

Safety consciousness and psychological empowerment dimensions meaning, competence and impact are positively related, with medium effect. In an environment where safety is a priority, such as the South African mining industry, employees - who are empowered in terms of safety knowledge and safety promoting behaviour and as decentralised decision makers - will have higher levels of safety consciousness (de Koster et al., 2011).

Psychological ownership was found to be positively related to competence, self-determination, and safety consciousness, with medium effect. This result implies that when employees experience self-efficacy and autonomy - that come with being psychologically empowered - the perceived sense of control over their work environment will lead to the development of feelings of ownership towards their organisation (Mishra & Spreitzer, 1998).

The fourth objective was to investigate whether authentic leadership, psychological empowerment, and psychological ownership, predict safety consciousness.

Based on the results of latent variable modelling, authentic leadership did not predict safety consciousness in this current study. Previous studies (Barling et al., 2002; de Koster et al.,

2011; Kelloway et al., 2006) suggest that when leadership emphasises safety as a priority, specifically by creating awareness around the safety issues, building on knowledge about safety promoting behaviour as well as leading by example and serving as a role model of these desired behaviours, he/she is likely to positively impact followers' safety consciousness. This was, however, not evident in this study. Three of the four dimensions of psychological empowerment, in this study, significantly predicted safety consciousness, namely competence, self-determination, and impact. An explanation could be that employees experience empowerment regarding safety-related issues and knowledge based on compliance programs rolled out. However, they do not experience having a say in safety-related issues and therefore do not experience themselves as having an impact.

Psychological ownership did not predict safety consciousness as expected. According to Olckers (2017), employees who experience psychological ownership assume the responsibility towards making work-related choices that are in the long-term interest of their organisation; decisions manifest in their workplace behaviours. In a mining environment where safety is a top priority, one of the long-term interests of the organisation is sustainable safe-production. An explanation could be that subordinates, due to the autocratic nature of the South African mining environment, do not experience a sense of control over safety-related matters in their environment that would result in higher levels of safety consciousness.

The fifth objective was to determine if there is an indirect effect between authentic leadership and psychological ownership, through psychological empowerment.

Psychological ownership refers to the ways in which employees relate to or feel psychologically attached to their organisation/workplace and even their work, resulting in a strong sense of concern and a heightened sense of responsibility towards the target of ownership which, in this context, is the organisation (Dawkins et al., 2017). The experience of control and autonomy akin to psychologically empowered workplaces is likely to impact employees' feelings of psychological ownership (Campbell-Pickford et al., 2016). Authentic leaders create work environments that are inclusive, caring, engaged and more oriented towards developing strengths (Nel, Stander, & Latif, 2015). When followers perceive their leaders as being authentic, they are likely to experience a strong sense of meaning at work, and a perception of themselves as autonomous in their decision making; both important factors for psychological empowerment.

The results of this study indicated that authentic leadership had an indirect effect on psychological ownership through the “impact” dimension of psychological empowerment. It is, therefore, evident that when subordinates perceive their leader/supervisor as being authentic, they will experience (to a higher degree) that their efforts are making a difference in their workplace/job (i.e. having an impact); and psychological ownership will be fostered. An explanation of the results could be that authentic leaders, by openly sharing information and expressing their thoughts and feelings, foster a work environment that is characterised by respect, transparency, inclusiveness and trust in employees as decentralised decision makers (Alok, 2014). Subordinates, who experience their supervisors as encouraging a participative work environment, information sharing and subordinate input, are found to have high levels of psychological empowerment (Gill et al., 2017). Subordinates, seeing their suggestions or inputs being valued and implemented (to some degree) within the organisational setting and thus influencing outcomes (Spreitzer, 1995), will experience feelings of having an impact on the work environment or organisation. When employees experience possessing the capability to influence or sway organisational consequences [impact], the perceived control is likely to result in heightened feelings of ownership central to the psychological ownership construct.

The sixth objective was to determine if there is an indirect effect between authentic leadership and safety consciousness, through psychological empowerment.

Safety consciousness, unlike other safety-related concepts, refers to the individual’s awareness of safety issues; an understanding of which behaviours will foster safety, also enacting those behaviours (de Koster et al., 2011). In a safety critical environment, an authentic leader, given his/her transparent and empowering nature, is likely to openly share safety-related information with subordinates, empowering them to effectively deal with such issues in his/her absence. As a result of the psychologically empowering nature of the authentic leader, employees are likely to experience increased awareness of safety issues and safety promoting behaviours, and would thus experience more safety consciousness.

The results of this study indicate that authentic leadership did not have an indirect effect on safety consciousness through psychological empowerment. This result was unexpected, as studies (Barling et al., 2002; de Koster et al., 2011; Kelloway et al., 2006) suggest that safety specific leadership enhances employees’ awareness of safety issues and knowledge of safety-

directed behaviours, resulting in enacting behaviours that promote safety (i.e. safety consciousness). An explanation of the results could be that no significant relationship was indicated between authentic leadership and safety consciousness as per hypothesis four. Therefore, an indirect impact of authentic leadership on safety consciousness via psychological empowerment would not have been present. According to Maximo (2015), supervisors represent some of the most disempowered levels of management in the mining industry, being preoccupied with production demands. This could result in a general lack of concern for safety consciousness; owing to feelings of constrain in their roles.

The seventh objective was to determine if there is an indirect effect between authentic leadership and safety consciousness, through psychological ownership.

The influence of authentic leadership on safety consciousness through psychological ownership was found to be statistically significant. Authentic leaders involve their subordinates in decision making by openly sharing and exchanging information, being open to followers' criticism, making objective decisions by considering all the information, whilst using their core values as a guide (Vem et al., 2017; Walumbwa et al., 2008). The followers of such leaders report being treated fairly, valued and highly involved. Reciprocally, a sense of possession, self-identity and responsibility towards the organisation is experienced (Alok, 2014; Mustafa et al., 2016; Vem et al., 2017). With a strong emphasis on safety as a value and being the responsibility of all employees employed at the mine (Chamber of Mines of South Africa, 2017), followers who experience their leaders as being authentic experience a sense of psychological ownership towards their organisation; they are likely to feel a strong sense of responsibility towards organisational safety and thus heightened safety consciousness. It is, therefore, evident in the current study that subordinates perceiving their leaders as being authentic, experience increased psychological ownership, leading to a strong sense of safety responsibility and thus safety consciousness (Dawkins et al., 2017; de Koster et al., 2011).

3.2 LIMITATIONS

The study had a number of limitations which should be considered when interpreting the data.

First, it is important to note that the study was cross-sectional in nature; data was collected at one point and not over a period of time. This may create potential problems, limiting the ability to make causal inferences. The cross-sectional design may also lead to common method bias.

Second, the study was very context specific (a South African mine) and because leadership should be investigated within context, results cannot be generalised to other contexts without first testing the validity of the study in the new context.

Third, the use of self-report surveys was the researcher's only source of information. This may serve as a limitation due to the fact that this type of survey looks at how the participant perceives the construct and might not measure the actual construct content. Common method variance may arise as an issue and a limitation.

3.3 RECOMMENDATIONS

Despite the limitations mentioned above, several recommendations can be made from the present findings for future research and practice; this was the last objective of the study.

3.3.1 Recommendations for Practice

Based on the findings of the current study, it becomes apparent how important it is that organisations understand the value and impact of authentic leadership in relation to employee outcomes (psychological empowerment, psychological ownership, safety consciousness), as well as organisational outcomes (productivity, safety performance). With the compounding challenges facing the mining industry, it is imperative to recognise leadership as being essential in addressing these challenges. As such, organisations should begin to view leadership from an authentic perspective. Authentic leaders, by their very nature, foster a work environment conducive to positive employee experiences (Alok, 2014; Gardner et al., 2005) of psychological empowerment and psychological ownership, leading to safety consciousness and overall positive safety performance.

Grooves (2006) suggests five key components in developing authentic leadership; the organisation should, firstly, embark on a process of identifying its leadership talent. This is done through the establishment of a leadership pipe-line, with a long term perspective of not only identifying talent, but also developing it. This long term view will afford the

organisation the convenience of having skilled leaders readily available to fill leadership positions as and when needed. Secondly, action-oriented development activities should be prioritised; an example could be gathering potential leadership talent to study and discuss current business issues. In addition to studying and discussions, potential leadership candidates should make recommendations to management on how to best deal with the issues; this will in turn help them cultivate their leadership skills (Waddell, Creed, Cummings, & Worley, 2016). The third component is teaching; the organisation should advance leadership development by acquiring the services of experts in authentic leadership as well as senior managers to present workshops and facilitate learning around authentic leadership topics (Grooves, 2006). It will require a strong commitment on the part of senior management to reinforce the talent management process. Fourthly, it should be of strategic importance to establish an organisational culture that is supportive of and promotes leadership development, with a special emphasis on authentic leadership as the desired organisational leadership style. Lastly, Grooves (2006) recommends persuasive mentoring and coaching to facilitate the development of authentic leadership. By placing managers in mentoring relationships with direct subordinates, the organisation can establish its own network of mentors. Through these mentoring relationships, mentors (managers) will coach and mould the leadership talent into the type of authentic leaders set out in the talent management and leadership development strategy, whilst also building enduring relationships with the mentees.

3.3.2 Recommendations for Future Research

In an effort to avoid the limitations of cross-sectional approaches, future research can look into how a longitudinal approach may allow for a more in-depth investigation of causal effects. Secondly, future research should look into investigating authentic leadership, psychological empowerment, psychological ownership and safety consciousness over a diverse range of organisations and industries, and even make comparisons across different industries. Furthermore, future studies can include larger samples. Lastly, future research may look into employing mixed data collection methods for richer data, in order to mitigate the challenge of common method variance.

3.4 CHAPTER SUMMARY

In this chapter, conclusions regarding each of the objectives of the study, from empirical and theoretical perspectives depending on the nature of the respective objective, were addressed. The chapter concluded exposing limitations of the current study and making recommendations for future research and practice.

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