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# Authentic leadership, safety behaviour and psychological capital in South African construction



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**Orientation:** Amid growing health and safety concerns in South African construction, leaders must foster and model safe behaviours to promote compliance and participation. Despite construction being inherently dangerous, psychological capital (PsyCap) offers a constructive alternative to enhance safety behaviour.

**Research purpose:** The study examined the relationship between authentic leadership and safety behaviour as mediated by PsyCap and its individual dimensions separately.

**Motivation for the study:** The construction industry must identify new ways to manage challenging work environments to reduce safety violations which impact employee wellness, accident track records and organisational performance. Viewing safety through a positive lens may help organisations identify novel approaches to improve safety behaviour in construction.

**Research approach/design and method:** This cross-sectional, quantitative study used online and paper-based surveys to investigate relationships between the constructs. Convenience sampling was employed to recruit workers across hierarchical levels at three locations within two South African construction firms.

**Main findings:** There is a positive relationship between authentic leadership and safety behaviour. Hope and efficacy fully mediated the relationship between authentic leadership and safety behaviour. Optimism partially mediates the relationship, while resilience has no impact.

**Practical/managerial implications:** Practitioners can apply these findings to support talent management and other workplace interventions to improve leadership development, foster PsyCap and improve safety behaviour.

**Contributions/value-add:** This research establishes the foundation for understanding how authentic leadership and PsyCap influence safety behaviour in the construction industry. It will help South African construction firms manage demanding environments and reduce occupational safety violations and related injuries.

**Keywords:** authentic leadership; psychological capital; safety behaviour; hope; optimism; self-efficacy; resilience; South Africa; construction.

## Introduction

The South African construction industry features among the top four high-risk sectors in the country, with approximately two fatalities a week and more than R500 million for compensation of injuries and diseases in this industry alone in the 2023 financial year (Sibiya, 2024). The South African Occupational Health and Safety accord aims for zero harm to employees by eliminating work-related fatalities, injuries and diseases; it is evident that the construction industry is falling short of these targets (Thejane, 2024).

According to the national statistics drawn from the records of the Federated Employers Mutual Assurance Company (FEMA, 2024), the construction industry has observed 6331 workplace accidents, including 722 permanent disabilities and 60 fatalities in 2024. The FEMA represents around 50% of the claims of registered construction businesses in the sector, excluding the informal construction sector and underreported injuries. To prevent this from escalating, organisations need to instil in their employees an awareness of safety behaviour and a willingness to engage in safety-related activities.

Leadership in the construction industry must take accountability for the poor safety statistics and invest in creating cultures that foster safety behaviour. DiMuro (2025) states that when leaders

create a work environment where employees feel appreciated and motivated, it will likely enhance individual and organisational success. Leadership behaviour is key as employees typically model leader behaviours and attitudes. Authentic leadership is known to foster positive behaviour and sustainable work environments (Joo & Jo, 2017; Luthans & Avolio, 2003). When a leader demonstrates an authentic leadership style, they are more likely to build trust among employees (Arruda, 2025) and enhance performance (Jang, 2022). Authentic leadership and its effect on several organisational outcomes have gained increased attention as demonstrated in the organisational psychology literature (Braun & Peus, 2018; Gardner et al., 2011; Jang, 2022; Luthans & Avolio, 2003). While it is well known that employees emulate leader behaviour, there is limited insight into how authentic leaders influence employees' psychological capital (PsyCap) and safety behaviour in the construction industry.

Empirical research that connects contemporary leadership theories, psychological constructs and associated outcomes distinctively to the construction industry within the South African context is limited. Despite this, the construction industry is largely overlooked as a source of information for realising the potential influence that leadership authenticity and PsyCap have on employees' performance indicators specific to this industry, particularly, employees' safety behaviour (Skeepers & Mbohwa, 2015; Wu et al., 2017).

Research suggests that when line management actively participates in safety initiatives, it reduces employee risk-taking behaviour (Kouabenan et al., 2015). Safety behaviour is influenced by leadership styles and attitudes, as employees are more likely to engage in safe practices when leadership demonstrates commitment to safety through, among others, clear policies and procedures (Guo & Yiu, 2015; Unnikrishnan et al., 2015; Zhang et al., 2016).

While blue-collar workers typically occupy roles that involve manual labour (Parietti, 2019), the inclusion of white-collar workers in safety research is critical in the implementation and long-term sustainability of safety practices (Zhang et al., 2016). Blue-collar and white-collar workers mutually influence one another in the practice of safe behaviours, underscoring the importance of including both groups in safety-related research (Carter, 2016; Karakaya & Yilmaz, 2013). Current research offers limited insight into the relationship between authentic leadership, PsyCap and employees' safety behaviour (Saleem et al., 2022). Further research is needed to determine whether and how authentic leadership influences safety behaviour and whether PsyCap or its factors play a role in the South African construction sector.

# Literature review

## Safety behaviour

Safety behaviour can be defined as workplace behaviours that influence the degree to which individuals and the broader work environment remain free from physical risks and harm (Beus et al., 2015). These behaviours can be intentional or unintentional in creating safe behaviours that prevent physical danger or harm or unsafe behaviours that place people in harm's way (Griffin & Neal, 2000). Safety behaviour is explained through safety performance, which is composed of safety compliance and safety participation (Griffin & Neal, 2000). Safety compliance refers to the essential activities required of employees to ensure and maintain workplace safety, such as abiding by safety protocols (Neal & Griffin, 2006). Safety participation refers to subtle behaviours that not only assist others to be safe but also take initiative to foster a culture of safety (Neal & Griffin, 2006). Several factors influence safety behaviour, including experience, age, knowledge, performance pressures, overconfidence, long working hours, non-compliance with safety protocols and the like (Dodoo & Al-Samarraie, 2019; Seixas et al., 2008; Siu et al., 2004). For example, when employees are given tight deadlines, there is pressure to complete work tasks speedily, which in turn leads to a decrease in adherence to safety protocols and higher accident rates (Manjula & De Silva, 2018). In addition to employee-related factors, leaders serve as role models and create a workplace climate that promotes safety (Neal & Griffin, 2002). When leaders demonstrate admirable behaviours and foster self-confidence, employees are more likely to identify with them and pursue shared goals (Nielsen et al., 2008). For example, behaviour-based safety programmes have been shown to be an effective leadership approach for increasing the occurrence of safe workplace behaviours (Choudhry, 2014).

Work-related injuries owing to unsafe behaviours have negative consequences for the organisation and the employee. However, employees who adopt safe workplace behaviours protect themselves and help reduce incidence costs, insurance premiums and operating costs (Amissah et al., 2019). Safe workplace behaviours enhance workplace trust, accountability, systems and overall work experiences (DePasquale & Geller, 1999; Neal & Griffin, 2006). Albeit that occupational health and safety are driven by the behaviour of frontline employees, leaders play a vital role in advocating, modelling and strengthening such behaviours (Health and Safety Authority, 2013).

Safety behaviour is interpreted according to its two key dimensions, which align with the safety performance subscale, acknowledging that effective safety performance involves both mandated and discretionary actions (Neal & Griffin, 1997, 2000).

## Authentic leadership

Authentic leadership is a process shaped by positive psychological capacities and a highly developed business context, fostering self-awareness, self-regulated leadership and follower behaviours that promote self-development (Luthans & Avolio, 2003). It is a multifaceted leadership style

encompassing self-awareness, relational transparency, internalised moral perspective and balanced processing of information (Gardner et al., 2011; Walumbwa et al., 2008). Self-awareness considers the extent to which individuals are actively aware of their interpersonal relationships and interactions with others and of their internal states (Riggio, 2014). Relational transparency is associated with truthfulness and integrity (Milton, 2009). Internalised moral perspective is a transparent decision-making process that draws on moral capacity, efficacy, courage and resilience to address ethical issues and support consistent moral actions (May et al., 2003). Balanced processing is the evaluation of self-relevant information without distorting or denying internal experiences and external realities before deciding on a course of action (Walumbwa et al., 2008; Yasir & Mohamad, 2016).

Authentic leadership is valuable in the workplace as employees tend to have higher performance (Lyuboynikoya et al., 2017), well-being (Huang, 2017) and organisational commitment (Baek et al., 2019) when their leaders display authentic characteristics. Like PsyCap, authentic leadership is rooted in positive organisational behaviour, as identified positive psychological capabilities have been proven to be state-like and therefore play a critical role in developing employees and teams to thrive (Joo & Jo, 2017; Kugler et al., 2025; Luthans & Avolio, 2003).

Authentic leadership is conceptualised in line with Walumbwa et al. (2008) definition, noting the four dimensions that describe leaders who act in accordance with their values, openly share information and make balanced, objective decisions. This justifies the application of the Authentic Leadership Questionnaire (ALQ) (Walumbwa et al., 2008).

## Psychological capital

Psychological capital is a higher-order positive psychological state characterised by four components: *self-efficacy*, the confidence that one can take on and succeed at challenging tasks; *hope*, the drive to pursue goals and the ability to adapt when difficulties arise; *optimism*, the expectation of positive outcomes now and in the future and *resilience*, the ability to recover from setbacks and persevere in the face of adversity (Luthans et al., 2007b).

Numerous positive outcomes at the individual, group and organisational levels have been observed. Walumbwa et al. (2010) argue that PsyCap has a ripple effect, whereby an individual's PsyCap spreads to teams, departments and the overall organisation. Avey et al. (2011) show positive associations between PsyCap and numerous attitudes and behaviours, including job satisfaction, well-being, organisational commitment and the like. Kugler et al. (2025) concur that PsyCap is positively related to both in-role and extra-role performance outcomes. Further to this, PsyCap is significantly positively associated with emotional intelligence (Aderibigbe & Mjoli, 2019). Higher PsyCap can be linked to improved financial performance over time, as individual and team PsyCap can aggregate at the organisational level (McKenny et al., 2013). Given that organisational outcomes are influenced by leaders, authentic leadership warrants further examination because of its foundation in positive emotions, hope, self-confidence and goal achievement (Joo & Jo, 2017).

PsyCap is likely to thrive in a culture that is shaped and maintained by sincere leaders who foster hope, offer alternative means to achieve goals and recover from setbacks (Luthans et al., 2008). Research suggests that when leaders communicate and delegate effectively, implement work–life balance initiatives and offer career guidance, their followers' PsyCap increases (Cimen & Ozgan, 2018).

PsyCap is established in accordance with Luthans et al. (2007b) as a positive psychological state of development characterised by self-efficacy, hope, resilience and optimism. This underpins the use of the Psychological Capital Questionnaire (Luthans et al., 2007b).

## Relationship between the constructs

A theoretical relationship between authentic leadership, PsyCap and safety behaviour can be derived from the literature. Authentic leaders are believed to inspire authenticity in followers by capitalising on positive psychological states and through positive role modelling, a form of social learning whereby employees adopt authentic behaviours by observing leaders or receiving guidance (Bandura, 1978; Gardner et al., 2005). Through the adoption of leader-modelled behaviours, employees adjust how they interpret information and evaluate the work environment (Turner, 2017). Authentic leaders promote the development of PsyCap and increase engagement owing to consistent values and objective decision-making (Banks et al., 2016).

A study done by Wang et al. (2018) demonstrates that PsyCap has a direct influence on employees' safety behaviour. Saleem et al. (2022) suggest that hope and optimism have a positive impact on safety compliance and safety participation, which make up safety behaviour. In their research, they further identify that resilience has a significant positive effect on safety participation, while it has a significant negative effect on safety compliance. Optimism is significantly related to both safety compliance and safety participation, suggesting that they are related to safety behaviour (Saleem et al., 2022). Akanni et al. (2021) indicate that bank employees high in self-efficacy were likelier to engage in safety behaviours. In highly demanding occupations, PsyCap acts as a resource to help cope with workplace stressors, thereby promoting greater adoption of safety behaviours through participation and compliance (Margheritti et al., 2023). Critics caution against excessively high levels of personal resources, particularly optimism and self-efficacy, as they may inadvertently cause higher accident and injury rates because of overconfidence or underestimating the perceived risk of a situation (Margheritti et al., 2023).

When framing safety behaviour as a performance outcome, authentic leadership and PsyCap are expected to contribute to greater compliance with and active participation in safety practices. Safety-focused authentic leaders foster safety-focused followers through modelling, which stimulates positive organisational behaviour processes (Eid et al., 2012). A study done on 3495 nurses in China suggested that PsyCap significantly mediated the relationship between authentic leadership and nurses' caring behaviour (Zhang et al., 2023). By implication, would PsyCap mediate the relationship between authentic leadership and safety behaviour? To delve deeper, would the individual factors of PsyCap (optimism, resilience, hope and efficacy) mediate the relationship between authentic leadership and safety behaviour? In this context, the following hypotheses were developed:

- **$H_1$:** There is a positive relationship between authentic leadership, PsyCap and safety behaviour.
- **$H_2$:** PsyCap mediates the relationship between authentic leadership and safety behaviour.
- **$H_3$:** Optimism mediates the relationship between authentic leadership and safety behaviour.
- **$H_4$:** Resilience mediates the relationship between authentic leadership and safety behaviour.
- **$H_5$:** Hope mediates the relationship between authentic leadership and safety behaviour.
- **$H_6$:** Efficacy mediates the relationship between authentic leadership and safety behaviour.

Although current research suggests relationships between these constructs, the relationships have not been tested in a South African construction environment.

# Research design

The study followed a non-experimental, quantitative research approach using a cross-sectional survey design. Non-probability convenience sampling was employed to recruit research participants at two construction entities across three sites located in the Western Cape, Gauteng and KwaZulu-Natal provinces.

The sample consisted of full-time employees in the South African construction industry spanning hierarchical levels from blue-collar workers (installation technicians, paving installers and maintenance technicians) to white-collar staff (supervisors, line managers, senior managers and administrative employees). Data were collected using paper-and-pencil and online questionnaires, yielding 198 completed responses. The sample composed of 89% males and 11% females, with 7% in supervisory roles, 14% in management, 9% in administrative positions and the remainder as technicians and installers. Nearly half (47%) of the respondents had been employed at their organisation for 2 years to 5 years. The premise that more males than females participated in the study is representative of the broader population. Case in point, the South African construction industry is predominantly recognised as male-dominated (Ness, 2012).

## Measuring instruments

A composite questionnaire was used to measure the study constructs. Safety behaviour was measured with Neal et al.'s (2000) amended 6-item safety performance scale measuring safety compliance and safety participation on a 5-point Likert scale. This scale was tested over the long term by Neal and Griffin (2006), supporting its reliability coefficients for both constructs: safety compliance (0.89) and safety participation (0.84). Furthermore, a study conducted by Nkhungulu (2014) in South Africa reported an overall reliability of 0.96. PsyCap was measured with the 24-item PsyCap Questionnaire (PCQ-24), comprising the factors such as hope, optimism, resilience and efficacy, with statements rated on a 6-point Likert scale (Luthans et al., 2007a). The original scale demonstrated the following reliabilities for each construct: hope (0.88), optimism (0.89), resilience (0.89) and self-efficacy (0.89). Authentic leadership was measured using the 16-item ALQ, requiring participants to rate their direct leader on a 5-point Likert scale, measuring self-awareness, relational transparency, internalised moral perspective and balanced processing (Walumbwa et al., 2008). The items describe leader behaviours, and respondents were asked to rate how frequently leaders exhibit these behaviours. This scale yielded an acceptable standard consistency for each concept: self-awareness (0.92), relational transparency (0.87), internalised moral perspective (0.76) and moral balanced processing (0.81). Psychometric properties have been shown to be acceptable for all the chosen instruments. Permission was granted by Mind Garden to utilise the PCQ-24 and ALQ, while the other measuring instruments are freely available for use by researchers.

## Data collection

Permission to conduct research was granted by the participating organisations. Data were collected through paper-and-pencil format in group settings, accommodating operational schedules and minimising workplace disruption. To ensure inclusivity, one-on-one administration was provided for participants with low literacy levels. Online administration was also utilised, providing additional opportunities for participants to complete the survey and facilitating the finalisation of the data collection process.

## Data analysis

Data were analysed using IBM (International Business Machines Corporation), Armonk, New York, US. SPSS, version 25, along with IBM AMOS, version 25, to calculate Pearson's product moment correlation, confirmatory factor analysis (CFA) and structural equation modelling (SEM). Three control variables were used to eliminate alternative explanations for the research findings, namely gender, age and employment tenure. To allow for consistency in data analysis and improved results interpretation, the scales were recoded, so all responses were calculated as a 7-point Likert scale. Confirmatory factor analysis was used to determine the reliability of

the scale. All measuring instruments showed good reliability; however, three problematic items (items 13, 20 and 23) were removed. These items measured optimism and resilience. Previous studies have consistently shown that these subscales have less internal consistency than the other two subscales in the PCQ-24 (Avey et al., 2010; Luthans et al., 2007a). All subsequent analyses were based on the 21-item model. Cronbach's alphas for all instruments can be seen in Table 1, with all the measuring instruments demonstrating acceptable reliability.

### Ethical considerations

Ethical approval to conduct this study was obtained from Nelson Mandela University Research Ethics Committee (Human) (No. H20-BES-HRM-007). All research procedures complied with institutional ethical guidelines, and informed consent was obtained from all individual participants in the study. This included anonymity and *Protection of Personal Information Act* (*POPIA*) compliance.

## Results

The means, standard deviations, reliabilities and correlations between the study variables are reported in Table 1.

The results in Table 1 suggest a strong, positive relationship between PsyCap and safety behaviour ($r = 0.547$, $p < 0.01$), a moderate positive relationship between PsyCap and authentic leadership ($r = 0.458$, $p < 0.01$) and a moderate positive relationship between authentic leadership and safety behaviour ($r = 0.351$; $p < 0.01$). This suggests that employees with higher levels of PsyCap are more likely to engage in safe work practices. Furthermore, perceiving leaders as authentic may enhance PsyCap in the workplace. Authentic leadership is also moderately positively related to hope, optimism and self-efficacy while only maintaining a weak positive relationship with resilience ($r = 0.255$; $p < 0.01$). Hope, optimism, resilience and efficacy all have a moderate positive relationship with safety behaviour. Based on these results, H1 is accepted.

Table 2 represents the regression weights for PsyCap as a mediator between authentic leadership and safety behaviour.

Table 2 shows the original model demonstrates a positive relationship between authentic leadership and safety behaviour that is statistically significant ($p = 0.002$). When PsyCap (mediating variable) is introduced into the mediation model, it shows that authentic leadership (independent variable) has a positive, statistically significant effect on PsyCap, implying that as authentic leadership increases, so does employee PsyCap. It further shows that authentic leadership has a small, non-significant effect on safety behaviour (dependent variable), indicated by the *p*-value of 0.791, and then that PsyCap has a strong positive statistically significant effect on safety behaviour. Psychological capital therefore mediates the relationship between authentic leadership and safety behaviour, as the *p*-value for authentic leadership becomes insignificant. This implies that PsyCap fully mediates the relationship and H2 is accepted. The model fit summary in Table 7 supports this result. The $R^2$ value of 0.145 in the model suggests that approximately 15% of the variance in safety behaviour can be explained by the addition of PsyCap.

Table 3 to Table 6 present the regression weights of the various mediation models relating to the PsyCap factors individually, namely optimism, resilience, hope and efficacy, while Table 7 outlines the model fit summaries for each model.

As can be seen from Table 3, the *p*-value for authentic leadership becomes less significant ($p = 0.014$) when optimism is introduced into the relationship. This implies that optimism partially mediates the relationship between authentic leadership and safety behaviour. The adjusted

**TABLE 2:** Regression weights for original model and overall psychological capital as a mediator.

| Variables | Estimate | SE | CR | *p* |
|---|---|---|---|---|
| **Original model for the relationship between authentic leadership and safety behaviour** | | | | |
| Authentic leadership → Safety behaviour | 0.263 | 0.083 | 3.165 | 0.002 |
| **Model for PsyCap as a mediator between authentic leadership and safety behaviour** | | | | |
| Authentic leadership → PsyCap | 0.352 | 0.067 | 5,245 | *** |
| Authentic leadership → Safety behaviour | 0.02 | 0.074 | 0.265 | 0.791 |
| PsyCap → Safety behaviour | 0.871 | 0.169 | 5.163 | *** |

*Source*: Adapted from Turner, G. (2021). *Authentic leadership, psychological capital, work engagement and safety behaviour in a construction environment*. Doctoral dissertation. Nelson Mandela University Repository. Retrieved from https://commons.mandela.ac.za/vital/access/manager/Repository/vital:46487?site_name=Nelson+Mandela+University

Note: $R^2 = 0.269$; adjusted $R^2 = 0.145$.

SE, standard error; CR, composite reliability, PsyCap, psychological capital.

***, $p < 0.001$.

**TABLE 1:** Descriptives, reliabilities and correlations for the study.

| Variables | M | SD | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
|---|---|---|---|---|---|---|---|---|---|
| 1. Authentic leadership | 5.25 | 1.50 | (0.942) | 0.498** | 0.373** | 0.255** | 0.343** | 0.458** | 0.351** |
| 2. Self-efficacy | 5.71 | 1.06 | - | (0.824) | 0.617** | 0.524** | 0.451** | 0.801** | 0.489** |
| 3. Hope | 5.77 | 1.18 | - | - | (0.783) | 0.562** | 0.529** | 0.825** | 0.482** |
| 4. Resilience | 5.54 | 1.03 | - | - | - | (0.673) | 0.597** | 0.809** | 0.357** |
| 5. Optimism | 5.67 | 1.01 | - | - | - | - | (0.783) | 0.812** | 0.436** |
| 6. PsyCap | 5.72 | 1.06 | - | - | - | - | - | (0.904) | 0.547** |
| 7. Safety behaviour | 5.87 | 1.25 | - | - | - | - | - | - | (0.893) |

*Source*: Adapted from Turner, G. (2021). *Authentic leadership, psychological capital, work engagement and safety behaviour in a construction environment*. Doctoral dissertation. Nelson Mandela University Repository. Retrieved from https://commons.mandela.ac.za/vital/access/manager/Repository/vital:46487?site_name=Nelson+Mandela+University

Note: Internal consistency reliability coefficients appear in parentheses along the main diagonal.

M, mean; SD, standard deviation; PsyCap, psychological capital.

**, $p < 0.01$.

**TABLE 3:** Regression weights for optimism as a mediator.

| Variables | Estimate | SE | CR | *p* |
|---|---|---|---|---|
| Authentic leadership → Optimism | 0.384 | 0.086 | 4.479 | *** |
| Authentic leadership → Safety behaviour | 0.176 | 0.072 | 2.460 | 0.014 |
| Optimism → Safety behaviour | 0.376 | 0.088 | 4.273 | *** |

Note: $R^2$ = 0.299; adjusted $R^2$ = 0.175.
SE, standard error; CR, composite reliability.
***, $p < 0.001$.

**TABLE 4:** Regression weights for resilience as a mediator.

| Variables | Estimate | SE | CR | *p* |
|---|---|---|---|---|
| Authentic leadership → Resilience | 0.209 | 0.079 | 2.653 | 0.008 |
| Authentic leadership → Safety behaviour | 0.209 | 0.077 | 2.717 | 0.007 |
| Resilience → Safety behaviour | 0.480 | 0.181 | 2.656 | 0.008 |

Note: $R^2$ = 0.305; adjusted $R^2$ = 0.181.
SE, standard error; CR, composite reliability.

**TABLE 5:** Regression weights for hope as a mediator.

| Variables | Estimate | SE | CR | *p* |
|---|---|---|---|---|
| Authentic leadership → Hope | 0.344 | 0.072 | 4.808 | *** |
| Authentic leadership → Safety behaviour | 0.115 | 0.074 | 1.553 | 0.12 |
| Hope → Safety behaviour | 0.619 | 0.121 | 5.134 | *** |

Note: $R^2$ = 0.379; adjusted $R^2$ = 0.255.
SE, standard error; CR, composite reliability.
***, $p < 0.001$.

**TABLE 6:** Regression weights for efficacy as a mediator.

| Variables | Estimate | SE | CR | *p* |
|---|---|---|---|---|
| Authentic leadership → Efficacy | 0.438 | 0.077 | 5.699 | *** |
| Authentic leadership → Safety behaviour | 0.049 | 0.074 | 0.656 | 0.512 |
| Efficacy → Safety behaviour | 0.613 | 0.135 | 4.532 | *** |

Note: $R^2$ = 0.361; adjusted $R^2$ = 0.237.
SE, standard error; CR, composite reliability.
***, $p < 0.001$.

**TABLE 7:** Model fit summaries for all the models.

| Fit indices | Original AL → SB | PsyCap | Optimism | Resilience | Hope | Efficacy |
|---|---|---|---|---|---|---|
| CMIN/*df* | 1.789 | 1.584 | 1.649 | 1.603 | 1.698 | 1.686 |
| CFI | 0.942 | 0.891 | 0.938 | 0.942 | 0.926 | 0.929 |
| SRMR | 0.052 | 0.066 | 0.055 | 0.053 | 0.056 | 0.059 |
| RMSEA | 0.063 | 0.054 | 0.057 | 0.055 | 0.060 | 0.059 |

CMIN, minimum discrepancy; *df*, degrees of freedom; CFI, comparative fit index; SRMR, standardised root mean square residual; RMSEA, root mean square error of approximation; PsyCap, psychological capital.

*R*-squared accounts for the variance in safety behaviour (dependent variable) when optimism (mediation variable) is added into the mediation model. The model suggests that 18% of the variance in safety behaviour is partially explained by the addition of optimism. Based on these results, H3 is partially accepted.

As can be seen from Table 4, the *p*-value for authentic leadership remains significant ($p = 0.007$) when resilience is introduced into the relationship. This implies that resilience is insignificant and does not mediate the relationship between authentic leadership and safety behaviour. Based on these results, H4 is rejected.

As can be seen from Table 5, the *p*-value for authentic leadership becomes significant ($p = 0.12$) when hope is introduced into the relationship. This implies that hope fully mediates the relationship between authentic leadership and safety behaviour. The adjusted $R^2$ is 0.255, suggesting that hope accounts for approximately 26% variance in safety behaviour when incorporated into the mediation model. Based on these results, H5 is accepted.

Table 6 indicates that the *p*-value for authentic leadership becomes insignificant ($p = 0.512$) when efficacy is introduced into the relationship. This implies that efficacy fully mediates the relationship between authentic leadership and safety behaviour. The adjusted $R^2$ is 0.237, indicating that the addition of efficacy explains approximately 24% of the variance in safety behaviour. Thus, based on these results, H6 is accepted.

Table 7 shows the model fit summaries for all the models.

The model fit summaries suggest a good model fit for all the test models. This supports the acceptance of H1, H5 and H6; the partial acceptance of H3 and the rejection of H4.

## Discussion

The research looks at the relationship between authentic leadership and safety behaviour for employees in the construction industry and particularly the mediating role of PsyCap and its factors in this relationship. In the construction industry, safety behaviour is critical in maintaining zero or low injury accident records. It is evident that there are positive relationships among the constructs in this study, with a particularly strong relationship between PsyCap and safety behaviour. Safety behaviour has a moderate positive relationship with hope, optimism, resilience and efficacy. The positive association of safety behaviour with optimism and hope concurs with the work of Saleem et al. (2022), while Aula et al. (2021) show a positive impact of optimism.

Leadership has been shown to significantly influence safety outcomes. Management or supervisor involvement is a key driver to safety performance because of their authority to shape policy and procedures (Guo & Yiu, 2015; Unnikrishnan et al., 2015). Cavazotte et al. (2013) found a positive relationship between authentic leadership and safety performance ($r = 0.47$, $p < 0.01$). However, being that leadership can be enacted strategically, remotely or from a distance, the relationship between authentic leadership and safety behaviour may not exhibit a strong observable effect (Wu et al., 2017). As such, the findings of this study provide evidence of a moderate relationship between authentic leadership and safety behaviour ($r = 0.351$, $p < 0.01$).

Authentic leadership was positively related to PsyCap and safety behaviour, concurring with the research of Wang et al. (2014) in a sample of 801 employees from a logistics company in Beijing. Banks et al. (2016) concur that authentic leaders result in higher PsyCap among their employees. These results denote that when employees view their leaders as

genuine and authentic, they have higher levels of both PsyCap and safety behaviour.

Authentic leaders draw on PsyCap to foster its development in others (Gardner et al., 2005). Their credibility and constructive problem-solving approach enhance employees' hope and optimism towards goal achievement (Avolio et al., 2004). This aligns with the view that when leaders are perceived as authentic, employees are more likely to experience PsyCap-related states such as hope, optimism, resilience and efficacy (Eid et al., 2012). Through modelling, shared beliefs, common goals and social learning, authentic leaders impact behaviour that has benefits for the individual and the organisation.

The results suggest that PsyCap mediates the relationship between authentic leadership and safety behaviour. This implies that authentic leadership indirectly influences employee safety behaviour through PsyCap. This finding supports the theoretical assumption that authentic leadership fosters positive psychological resources, which in turn promote greater engagement in safety behaviours. Similar to Zhang et al.'s (2023) work in nursing by developing authentic leaders, it led to an increase in PsyCap, therefore indirectly enhancing caring behaviour in the nursing study, but safety behaviour in the current study.

Authentic leadership has shown to influence employees' participation in safe work behaviours through the development of PsyCap. Eid et al. (2012) describe authentic leadership as a behavioural pattern that fosters PsyCap, which aligns with the present study. Further to this, Walumbwa et al. (2008) suggest that by providing comprehensive verbal and non-verbal information, authentic leaders promote self-awareness, transparency, ethical perspectives and balanced processing fostering employees' PsyCap.

The current study demonstrated that authentic leadership leads to the development of PsyCap, of which particularly efficacy and hope enhance employee's safety behaviour. Employees high on PsyCap exhibit greater safety behaviour than their counterparts. This means that self-efficacy and hope serve as facilitating mechanisms in the authentic leadership and safety behaviour relationship, by fostering positive psychological states that encourage safety compliance and safety participation to prevent accidents and injuries (Gardner et al., 2005).

Moreover, the results show that hope and efficacy as individual psychological factors fully mediate the relationship between authentic leadership and safety behaviour. This implies that authentic leadership influences safety behaviour indirectly by enhancing hope and efficacy among workers, which will increase safety behaviours.

Optimism is shown to partially mediate the relationship between authentic leadership and safety behaviour and may partially be responsible for variances in safety behaviour, while resilience has no significant impact on safety behaviour. According to Nahrgang et al. (2011), employees must utilise their full mental and physical capabilities to prevent workplace injuries and accidents. In addition, motivation to engage in safe practices often stems from authentic leaders being propelled to perform safely through access to necessary resources. This aligns closely with the components of PsyCap, which collectively enhance employee capacity to perform safely in demanding and dangerous work environments.

The results of this study align with existing literature, indicating that employees who perceived their leaders as authentic also reported higher levels of PsyCap and greater adherence to safety compliance and safety participation practices. Authentic leaders influence employees' psychological states through positive contagion, which create a work environment conducive to positive experiences (Adil & Kamal, 2016; Ilies et al., 2005). Authentic leaders who transfer or foster PsyCap among their employees equip them to be more successful and happier in both their work and personal lives (Adil & Kamal, 2016). Moreover, employees are more motivated to invest their best efforts in their work (Adil & Kamal, 2016), which should have a positive influence on their safety behaviour.

## Implications

Psychological capacities are known to be developable and malleable, making PsyCap a useful resource. Organisations should hire individuals with high PsyCap, focusing specifically on applicants with high hope and efficacy. Utilise PsyCap interventions in training and developing employees, which should ultimately benefit safety behaviour. While hiring authentic leaders is likely to have a positive impact on safety behaviours, practitioners can also help leaders develop authentic characteristics.

The results of this study offer promising suggestions to aid and support selection, training and development initiatives pertaining to leadership development, increasing levels of PsyCap, in conjunction with improved levels of safety performance and associated safety behaviours. Practitioners can help employees enhance their PsyCap and, in doing so, their safety behaviour.

Initiatives aimed at facilitating positive modelling processes by training supervisors and managers to be self-aware of their actions and decisions, consistent and transparent in communication with others, and to establish relationship with their employees and colleagues (Lyuboynikoya et al., 2017). In turn, this may allow employees to enhance their PsyCap and the degree to which they are engaged in their work. For example, authentic leaders motivate others, both directly and indirectly, to set realistic goals (hope), help them focus on past successes and copy other people to achieve future success (self-efficacy), face reality in

situations of despair and hopelessness and improvise to deal with the situation (resilience) and change focus to appreciate the moment and view the future as a source of opportunity (optimism) (Ohlin, 2020). Moreover, authentic leaders are more equipped to provide an environment conducive to development, clarify goals and encourage and provide constructive feedback to improve performance and facilitate growth, which increases work engagement and, in turn, workplace behaviour (Clarke, 2021). Keeping in mind that leaders are modelled by employees, it is important that leaders recognise the importance of adopting a leadership style that is genuine and one that is observed as such by their employees to ultimately contribute towards the health and safety of the organisation.

### Limitations of the study

Data were collected using two self-report measures and one other-report measure. In data collection, self-report measures can introduce reporting bias potentially skewing the data. In addition, the cross-sectional design of the study limits the ability to draw causal inferences between the relationships of variables. Longitudinal approaches may provide more robust results in future studies. It is valuable to note that data collection took place over an extended period, during which participants' perceptions of self and leaders may fluctuate, potentially influencing the results. Future research should include larger samples as well as other industries that require employees to be attentive to safety behaviours.

## Conclusion

The overarching aim of this study was to establish a relationship between authentic leadership, PsyCap and safety behaviours in the South African construction environment. The South African construction industry stands to benefit greatly from paying attention to leadership style and the impact of PsyCap on safety behaviour. The potential for improved health and safety numbers is more likely if focus is placed on the development of the constructs. If resources are devoted to improving PsyCap and authentic leadership, the South African construction industry may be better able to reduce work-related injuries and fatalities. Organisations would be able to focus on one factor or construct at a time, as the relationship between the constructs in the study is not mutually exclusive.

There is a clear indication that authentic leaders can influence PsyCap in employees, which could result in desired behavioural outcomes. Organisations that function within the construction industry are challenged with the increased pressure to prevent occupational injuries and accidents. The leaders of such organisations act as the focal point in facilitating the dissemination of favourable safety behaviour, that is, complying with safety rules and participating in safety practices, to prompt the development of PsyCap that will eventually lead to similar employee outcomes in terms of safety behaviour.

The results of this study provide evidence that employees' safety behaviour is influenced by authentic leadership perceptions, PsyCap and work engagement. Employees who perceive their leaders as authentic and genuine are more likely to demonstrate higher PsyCap and enhanced work engagement, which, in turn, positively impacts their safety behaviour. This is an important discovery that sheds light on the frustrating issues revolving around occupational health and safety faced by organisations that function in the South African construction industry (Skeepers & Mbohwa, 2015).

Employees who comply with and participate in safety-related practices enhance organisational safety statistics and therefore the South African construction industry. This is especially true when acknowledging the fact that the South African construction industry is constantly faced with increased workplace accidents and injuries. For this reason, researchers and practitioners are required to explore new ways of not only meeting but also exceeding occupational health and safety standards.

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### Competing interests

The authors declare that they have no financial or personal relationships that may have inappropriately influenced them in writing this article.

### Authors' contributions

G.L. did the research to complete her studies under the supervision and guidance of C.H. C.H. authored the article, revised it with updated references and managed the article submission.

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## Data availability

The data that support this study are available from the corresponding author, C.H., upon reasonable request.

## Disclaimer

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