

Testing a model of resilience for women leaders: a strengths based approach

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ABSTRACT

Objective: The aim of this study was to investigate the indirect processes through which cognitive, emotional and behavioural assets function to explain resilience amongst women leaders in higher education institutions.

Method: A quantitative cross-sectional survey design with a sample of N = 255 women leaders from higher education institutions was employed.

Results: All the proposed indirect pathways were found to be statistically significant and explained a fair proportion of the variance in the resilience scores of women leaders. Results revealed that cognitive assets (self-efficacy and mindfulness) were associated with resilience through association with emotional assets (positive affect and self-regulation) and behavioural assets (problem-solving skills and authentic functioning), both individually and in serial.

Conclusions: This study offers support for the direct and indirect relationships between mindfulness, self-efficacy, self-regulation, positive affect, authentic functioning, problem solving skills and resilience. It further generates new insights into the indirect processes through which cognitive, emotional and behavioural domains of influence may explain resilience amongst women leaders.

KEY POINTS

What is already known about this topic:

- (1) Women leaders remain underrepresented in higher education institutions when compared to their male counterparts.
- (2) Women leaders who possess higher levels of resilience are more likely to overcome the numerous barriers women face in higher education institutions when compared women leaders with lower levels of resilience.
- (3) There is an established direct relationship between personal strengths such as self-efficacy, self-regulation and problem-solving ability and resilience.

What this topic adds:

- (1) By investigating the proposed indirect pathways and the interaction between cognitive, emotional and behavioural assets, this study offers a more nuanced approach to understanding the processes that lead to resilience.
- (2) Using the cognitive-behavioural perspective of psychology as the theoretical framework to support the hypotheses proposed, this study expands the application of the cognitive behavioural model to explain resilience in the work context.
- (3) This study offers support for a newly proposed model of cognitive, emotional and behavioural domains of influence on resilience.

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Introduction

In recent years, there has been a significant amount of research focussing on the influx of women into the paid labour force. While the steady growth of women's participation in the workplace is acknowledged, the stark reality is that women continue to be globally underrepresented in leadership positions. Despite an overwhelming body of literature supporting the notion that women possess stronger leadership qualities than their male counterparts (Eagly & Carli, 2003; Hideg & Shen, 2019; Rosener, 1990), most women

continue to function in the second stratum of the workplace and the transcendence of women into leadership positions has not yet occurred at a suitable pace for it to be deemed transformative in nature. The underrepresentation of women in leadership is expansive and is said to pervade almost every sector of society representing a business case for organisations as denying women an opportunity to lead and contribute to strategic business decisions results in the underutilisation of a larger percentage of their workforce (Hideg & Shen, 2019; Pillay et al., 2022).

In the higher education sector, women remain clustered within the lower occupational levels while very few are afforded the opportunity for leadership roles (Herbst, 2020). Eddy and VanDerLinden (2006) provide further information on these leadership roles within the context of academia and argue that it typically consists of responsibilities including but not limited to: involvement in institutional structures, focussing on quality assurance and policy expansion, regulation of support services related to teaching and learning responsibilities, involvement in the regulating of departmental/organisational budgets and other resource allocation issues pertaining to teaching and research and the support thereof, contributing to the expansion of departmental policies and procedures, and providing advice on strategic issues for the faculty/university, which includes, but is not limited to, student and staff recruitment and support. These responsibilities can be found in leadership roles, which include but are not limited to senior lecturers, professors, heads of departments, programme managers, deans of faculties, associate directors and directors, vice-rectors, vice-chancellors, rectors, etc. Vaughn et al. (2020) argue that the underrepresentation of women in these leadership continues to be a global problem with women comprising less than a third of full professors in the United States of America while in the United Kingdom and German universities, women comprise under 18% of vice-chancellors. In South Africa, Herbst (2020) and Moodly and Toni (2019) add that women constitute only about 19% of vice-chancellors in higher education institutions. Vaughn et al. (2020) attribute the gross underrepresentation of women leaders in higher education to the “leaky pipeline”. This concept highlights the fact that while it is a challenge to find women in leadership positions in higher education, it is an even bigger challenge to retain those women who are already in leadership positions.

In understanding barriers to women academic’s leadership progression, Almaki et al. (2016) allude that women leaders continue to experience many challenges to their leadership progression which in the broader context may stem from the women leader’s themselves (internal barriers) or may come from society and the various institutional practices in place (external barriers). While internal barriers such as the imposter syndrome and lack of leadership identity are acknowledged, there is an overwhelming body of literature (Almaki et al., 2016; Hannum et al., 2015; Herbst, 2020; Longman et al., 2018; Morley, 2013) which argues that not only do external barriers pose a bigger threat to women’s leadership progression,

they are also the primary aggravating factors that serve to perpetuate a cycle of systemic underrepresentation. Unless there is a concerted effort to expose and eradicate these societal and institutional barriers, the gross underrepresentation of women in leadership positions will continue to grow.

The influence of these greater systemic barriers that are entrenched within society and the workplace in general, appear to be more damaging to women’s leadership progression (Hannum et al., 2015; Vaughn et al., 2020). The gendered nature of higher education institutions (Herbst, 2020), gender bias and discrimination (Morley, 2013) and unsupportive institutional culture (Longman et al., 2018) are all systemic barriers that hinder women’s leadership progression. In their review of unseen barriers that continue to oppress women leaders, Ibarra et al. (2013) state the following “Women leaders clearly navigate a different societal and organizational terrain from their male counterparts, a terrain deeply rooted in cultural ambivalence” (p. 379). These unseen barriers have a profound influence on the female leadership experience and significantly “disrupt the learning cycle at the heart of becoming a leader” (Ibarra et al., 2013, p. 62), which often results in those female employees who are currently in or considering moving into leadership roles giving up.

It must be noted that resilience and the ability to overcome these barriers are but one factor in the fight for female leadership progression. To truly advance women in leadership, the systemic barriers discussed above need to be addressed. However, while this revolutionary task continues, it is necessary that women leaders continue to persist in their leadership roles and serve as role models for emerging women leaders. In order to do this, women need to utilise the psychological strength of resilience, which is a critical resource that is desperately needed given the barriers discussed above (Pillay, 2020; Weatherspoon-Robinson, 2013).

Resilience

Common definitions of resilience describe it as the ability to overcome stress sources, threats and challenges. However, authors in resilience (Cooper et al., 2013) argue that not only is resilience associated with the bouncing back after experiencing a setback, but it more importantly leads to an increased capacity to cope with any future challenges and threats i.e., positive adaptation. Southwick et al. (2017) argue that since the current leadership context requires leaders to lead during times of accelerated change brought about by globalisation and continuous labour market

disruption, resilience becomes a key factor in leadership success. These changing demands require leaders to adapt quickly to unplanned contingencies which is a core component of resilient leadership (Sobratee & Bodhanya, 2018). In addition to dealing with these challenges that all leaders face, women leaders must also overcome the numerous barriers of gender role stereotypes, imposter syndrome and lack of leadership identity mentioned above making resilience a crucial resource.

Despite the role of resilience as a key resource for leading in the modern workplace, there is limited research on resilience in the workplace, particularly amongst women leaders with most resilience literature emphasising resilience in developmental or clinical settings (Sobratee & Bodhanya, 2018). Of the studies that do exist, the primary approach used to understand the process of resilience is the socio-ecological perspective (Cooke et al., 2019; Yang et al., 2020). While this approach is holistic in its application by considering external domains of influence on resilience, it fails to emphasise the role of personal strengths in explaining resilience. Researchers in positive psychology (Zimmerman, 2013) argue that adopting a strengths-based approach to understanding resilience may in the long term, be more beneficial as it allows individuals to identify promotive factors i.e., resources or assets, that they already possess and use them to cope with daily challenges. According to Fergus and Zimmerman (2005) while both assets and resources can assist individuals to overcome risk and remain resilient, resources are external to the individual and include factors such as support, mentoring, or community organizations. Assets on the other hand, are positive factors that reside within the individual or internally and can be used to facilitate resilient responses to challenges. A distinguishing aspect of assets is that they are positive and serve to assist the individual in dealing with challenges. This makes them different from personal attributes or characteristics that sometimes may include factors that hinder resilient responses if not applied correctly.

Authors (Gray & Jones, 2018; Pillay et al., 2022; Tau et al., 2018) argue that because these personal assets are intrapersonal in nature, it is necessary to investigate the internal processes between the various domains of influence in which these assets originate i.e., cognitive, emotional and behavioural assets, interact with each other to explain resilient processes (Duchek, 2018). This paper attempts to expand the current understanding of internal processes of resilience by investigating the indirect pathways through which cognitive, emotional and behavioural assets

work together to explain the resilience levels of women leaders in higher education institutions.

Theoretical framework and hypotheses

Cognitive, emotional and behavioural processes of resilience

Cognitive assets

Cognitive assets refer to personal resources that are largely shaped by and originate within the cognitive domain and are formed through cognitive appraisal and cognitive framing. Within the current study, both mindfulness and self-efficacy have been identified as cognitive assets that may assist in explaining resilience. Itzvan et al. (2016) define mindfulness as a state of actively paying attention to the present moment in a manner that is free of judgement. According to Reid (2011), the very act of paying attention, which is the core aspect of mindfulness, is cognitive in nature, suggesting that the variable originates within the cognitive domain of influence. Wimmer et al. (2016), argue that despite the fact that mindfulness may be considered a special form of attention, which in itself is a cognitive phenomenon, there, is very little published research on the cognitive effects of mindfulness. In addition, very little is published on the role of heightened attention and awareness on resilience in particular. According to the literature evidence provided, the authors of this paper are of the impression that the concept of mindfulness provides an adequate representation of the cognitive domain of influence and therefore it was selected as a cognitive asset for this study.

In addition to mindfulness, self-efficacy is another cognitive asset that has an established relationship with resilience (Schwarzer & Warner, 2013). Bandura (1994) defines the concept of self-efficacy as a person's beliefs about his/her capabilities to cope with a range of experiences. These beliefs about ability are formed when stimuli received as trusted information becomes accepted and stored in one's memory. This information is generalized and established into belief, which occurs through cognitive processing (Rao et al., 2009). Authors (Giblett & Hodgins, 2021) also differentiate between task specific self-efficacy beliefs and generalised self-efficacy beliefs. Generalised self-efficacy beliefs refers to an individual's generalised competency belief, which remains relatively stable across situations and indicates one's belief in their ability to cope with a broad range of demanding and stressful situations. For the purpose of the study, generalised self-efficacy beliefs was selected over task specific self-

efficacy as the authors are of the belief that women leaders require a general sense of self efficacy to deal with the daily hurdles they must overcome. The integral role of cognitive processes in determining self-efficacy beliefs provide a direct representation of the importance of cognition in the self-efficacy process and hence self-efficacy was seen as an appropriate cognitive asset for this study.

Emotional assets

Ilies et al. (2020) refer to emotional assets as forms of emotional energies that can be enhanced, invested in and mobilized to facilitate goal attainment. Emotional assets identified in the current study include positive affect and self-regulation. Positive affect refers to a consistent mood state in which one experiences a range of positive emotions across varying situations (Pillay et al., 2022). These positive feelings facilitate resource building and positive adaptation to adverse circumstances i.e., resilience (Lyubomirsky et al., 2005). According to Kumpfer (1999), the ability to acknowledge the impact of affect or mood and their role in perpetuating negative responses, such as fear, anxiety, and depression, whilst using positive mood or affect to do this is a key emotional process towards resilient outcomes. Fredrickson et al. (2004) states that positive emotions and affect and mood dispositions facilitate long-term optimal functioning, and in contrast to negative affect and emotions that carry direct and immediate effects in situations that threaten survival, the broadened thought-action repertoire triggered by positive affect is beneficial in other ways. Due to its critical role in emotional processing and the implications it has for responses to adverse circumstances, positive affect was seen as adequately representing the emotional domain of influence and thus selected for this study.

Self-regulation can be defined as one's ability to manage the duration, experience and release of emotions and other aspects of the self in such a manner that is complementary to goal achievement (Inwood & Ferrari, 2018). While self-regulation may also extend beyond emotional aspects and have implications for cognition and behaviour, a strong component of self-regulation involves observing, evaluating, and modifying the strength and duration of emotional reactions (Vanderbilt-Adriance & Shaw, 2008). The active attempts to modify emotional responses then results in positive behavioural modification. Since emotional self-regulation becomes a trigger for regulation of other aspects of the self, it was seen as an adequate representation of the emotional domain of influence. This does not imply that it may not contain aspects of

cognitive and behavioural regulation as well but for the purpose of this study, the focus was placed on the emotional regulation aspect of the self.

Behavioural assets

Kumpfer (1999) asserts that while behavioural assets usually build on cognitive assets, they differ in the sense that behavioural assets extend beyond thoughts and feelings and may manifest through behavioural action, which can be observed through positive adaptation. Within the context of this study, problem-solving skills and authentic functioning have been identified as behavioural assets that may be used to foster resilience for women leaders. Authenticity can be defined as acting in accordance with the reflection of one's true self. This true self is made up of personal experiences, cognitions, affect and ways of viewing the world (Luthans & Avolio, 2003). When one engages in authentic functioning, they begin to act in accordance with the true self which is evident through their behavioural responses to various situations. Kieta et al. (2019) define problem-solving as behaviour which induces change while the response it promotes is referred to as the solution. The process ultimately ends in a set of planned behaviours, suggesting that there is a substantial behavioural component to problem-solving.

Indirect relationships between cognitive, emotional and behavioural assets and resilience

According to the cognitive behavioural perspective (Padesky & Mooney, 2012), an individual's positive appraisals brought about by cognitive assets may positively influence emotions and behaviour thus ultimately facilitating resilient outcomes. The cognitive behavioural perspective emphasises the dynamic interaction between cognitive, emotional and behavioural internal processes and the effect on resilient responses and will be used to guide the current study.

Cognitions to emotions to resilience (COG -> EMOT -> RESILIENCE)

Storbeck and Clore (2007) argue that scientific evidence and everyday observation indicate an interconnectedness between cognitive and emotion-related assets. In examining the relationships between cognitive and emotion-related assets, the link between mindfulness and self-regulation has been emphasised (Bowlin & Baer, 2012). Mindfulness can be interpreted as the act of paying attention on purpose and being aware of the present moment (Reid, 2011). Actively paying attention to the present moment, allows the individual to become aware of the observations,

sensations, thoughts, and feelings they are experiencing. Evans et al. (2009) asserts that when the individual becomes aware of self-defeating sensations, thoughts, and feelings, this awareness may spur on adaptive responses which leads to the regulation emotions and behaviour allowing them to exert control over responses to stressful events which leads to increased levels of resilience.

There is also a convincing body of evidence which supports the relationship between self-efficacy and positive affect (Borrachero et al., 2013; Caprara et al., 2006). These scientific studies argue that when the individual lacks self-efficacy or does not believe in their ability to deal with adversity, he/she begins to cultivate a negative affect resulting in non-resilient responses. However, when the individual believes they are capable of dealing with challenges and barriers, this belief increases positive affect. Authors, (Tugade & Fredrickson, 2004) state that individuals who have a positive and optimistic disposition towards stressful events are generally in a better position to deal with stressors and challenges, which makes them more resilient.

H1: Cognitive assets (mindfulness and self-efficacy) have an indirect effect on resilience through emotion-related assets (self-regulation and positive affect).

Cognitions to behaviour to resilience (COG -> BEH -> RESILIENCE)

According to Geifman and Raban (2015) self-efficacy or one's belief in their ability to deal with a range of problems, has a significant effect on problem-solving ability. When the individual has a strong belief in his/her ability to successfully work through problems, they are usually more determined and tend to persist during the problem solving process as they believe or are confident in their ability to solve said problem. An individual who believes and trusts in their ability to solve problems and propose solutions in challenging circumstances is more likely to be resilient (Huang & Flores, 2011). This suggests that self-efficacy belief (which is cognitive) is expected to lead to positive behavioural responses such as problem solving.

The second pathway between cognitive and behavioural assets and resilience occurs between mindfulness, authentic functioning and resilience. Leroy et al. (2013) argue that mindful practices encourage individuals to be aware of their thoughts, and behaviours in a manner that is non-judgemental which facilitate self-awareness. As the levels of self-awareness and self-acceptance begin to increase, the individual has a

greater propensity to express him/herself in ways that are consistent with the true self i.e., authentic functioning. Luthans and Avolio (2003) state that authentic functioning encourages a firm acceptance of reality (a key component in a resilient response) and more importantly the capacity to improvise and adjust to this new reality. This adjustment facilitates resilience. Rogers et al. (2003) argue that authentic functioning emphasises the ability to be aware of and manage one's feelings and impulses in accordance with the true self. This awareness is expected to help facilitate successful adjustment to challenges and threats and allows the individual to bounce back after experiencing setback i.e., resilience. Leroy et al. (2015) support the role of authentic functioning as an antecedent to resilience by stating that an individual that functions authentically tends to place less importance on others' views of them and as a result are less pressured by meeting expectations. Being able to act freely decreases apprehension and tension, which allows the individual to realistically deal with challenges and setbacks.

H2: Cognitive assets (self-efficacy and mindfulness) have an indirect effect on resilience through behavioural assets (authentic functioning and problem solving).

Cognitions to emotions to behaviour to resilience (COG -> EMOT -> BEH -> RESILIENCE)

While the indirect relationships between cognitions, emotions and resilience and cognitions, behaviour and resilience have been discussed independently, the assumptions made by the cognitive behavioural perspective indicate a possible serial mediation effect between these four dimensions. This study argues that a leader's positive cognitive interpretations of a challenge or stressful event (as influenced by self-efficacy and mindfulness) will determine a positive emotional response (positive affect and self-regulation) which in turn motivate adaptive behavioural action (problem-solving skills and authentic functioning) ultimately influencing resilience. Thus, it can be argued that emotion and behavioural assets in serial will mediate the relationship between cognitive assets and resilience.

Authors (Karoly, 1993; Kaunhoven & Dorjee, 2017; Nesbit, 2007) provide empirical evidence which suggests that mindfulness may influence self-regulation which encourages authentic functioning ultimately explaining resilience. During the process of regulating emotional responses, it is imperative that one engages in self-reflection to become aware of strengths that

must be enhanced and weaknesses that must be addressed. This suggests that, during the process of self-regulation, one must engage in the process of becoming self-aware, which is then linked to authentic functioning leading to a resilient response.

According to scholars in the field of positive psychology, generalised competency beliefs contribute to self-confidence which increases positive emotions (Borrachero et al., 2013; Caprara et al., 2006). The experience of positive affect is positively linked to greater problem-solving ability. Tugade and Fredrickson (2004) add that positive emotions broaden individuals' momentary thought-action repertoires, prompting them to pursue a wider range of thoughts and actions than is typical (e.g., play, explore, savour, and integrate). This is expected to encourage a wider exploration of problem-solving solutions, which in turn increases one's levels of resilience.

H3: Cognitive assets (self-efficacy and mindfulness) have an indirect effect on resilience through emotion-related assets (positive affect and self-regulation) and behavioural assets (authentic functioning and problem solving) in serial.

Figure 1 below presents the proposed conceptual model this study aims to test

Weatherspoon-Robinson (2013) asserts that while it should not be the case, the reality is that female leaders need to possess the resources to resist disruptions that threaten their career journeys, especially in contexts that are less than optimal. Importantly, a key definition of successful female leadership in particular, is the leader's ability to handle less than adequate work cultures while being aware that these conditions exist. These factors are indicative of resilience (Weatherspoon-Robinson, 2013). According to Sautelle et al. (2015) resilience is crucial in the leadership development process as it enhances a person's capability to persevere on a continued basis. Given the above argument, it becomes clear why the psychological strength of resilience and in essence, processes and assets that foster resilience are a crucial factor for women's leadership development. The proposed model of resilience and the included cognitive, emotional and behavioural processes assist in explaining how individuals and higher education institutions alike can assist in resilience development of aspiring women leaders.

Method

Design

The study employed a cross-sectional, quantitative survey research design.

Respondents

The sample consisted of women leaders from four higher education institutions in South Africa. Using the purposive sample technique, women leaders from both the academic and support services divisions were invited to participate in the study. Within the academic division, women leaders occupying job roles including senior lecturer, associate professor, professors, heads of departments and above were considered for participation. Female leaders in the support services division fulfilling the following leadership roles and responsibilities were considered: participating in key decision-making roles, providing input to and co-ordinating strategic departmental initiatives, and contributing towards departmental planning and strategic objectives. A sample of (N = 255) female leaders was obtained. The majority of the sample was 45 years or older (66.7%), while 61.6% of participants indicated that they were married. Just more than half of the respondents (55.3%) possessed a PhD degree. More than half (55.7%) of participants were leaders in the academic environment while 40.8% of respondents were from the support services division.

Measures

Resilience

The present study employed the 14-item Resilience Scale (RS-14) (Wagnild, 2009), which was found to be reliable in the sample ($\alpha = .88$). The original resilience scale consisted of 25 items and was later adapted to form a 14-item scale (RS-14) by Wagnild (2009). According to the author, the RS-14 was developed due to researchers' need for shorter instruments in an attempt to reduce participant burden and increase responses. The RS-14 is a 7-point Likert-type scale with scores ranging from 1 (strongly disagree) to 7 (strongly agree). Higher scores on the RS-14 indicate higher levels of resilience, while lower scores indicating lower levels of resilience. In terms of validity, a study conducted by Ntountoulaki et al. (2017) reported a clear one-factor solution of the RS-14 that explained 39.4% to 49.6% of the variance across the three samples in their study. All items clearly loaded on the one factor with all loadings being greater than 0.40 and most being greater than 0.60. Losoi et al. (2013) reported the following goodness-of-fit indices: comparative fit index (CFI) = > 0.95, root mean square error of approximation (RMSEA) = < 0.06, goodness-of-fit (GFI) = > 0.90, and adjusted goodness-of-fit (AGFI) = > 0.90. The authors concluded that the scale possesses good fit for a one-factor structure.

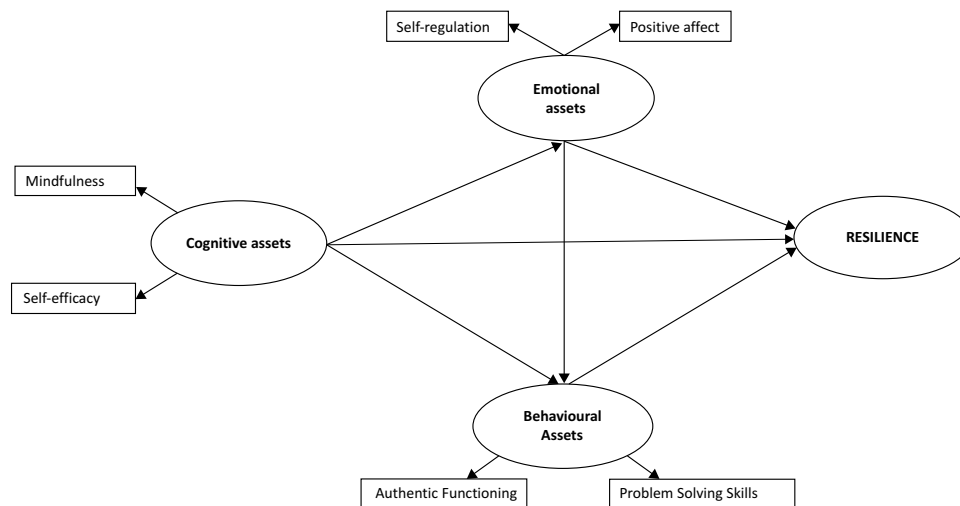


Figure 1. Proposed conceptual model tested in this study. Source: Author's own work

Cognitive assets (mindfulness and self-efficacy)

Mindfulness was measured using the 15-item Mindfulness Attention Awareness Scale (MAAS) developed by Brown and Ryan (2003), while self-efficacy was measured using the General Self-Efficacy Scale (consisting of 10 items) developed by Schwarzer and Jerusalem (1995). Both the MAAS ($\alpha = .89$) and the GSES ($\alpha = .86$) were found to be reliable in the present sample. In terms of validity, Kotzé and Nel (2016) found that the MAAS was a valid measure of mindfulness based on the following goodness-of-fit statistics: Satorra-Bentler $\chi^2 = 281.23$, $df = 90$, $RMSEA = 0.065$, $CFI = 0.97$, and Standardised Root Mean Squared Residual (SRMR) = 0.054. Regarding the validity of the GSES, Hurter (2008) stated that studies have shown that the GSES has high construct validity. According to Hurter (2008), there has been significant relationships between the GSES and other social cognitive variables (intention, implementation of intentions, outcome expectations, and self-regulation), which confirm the validity of the scale indicating adequate levels of construct validity. In a study conducted by Ramadan and Merkin (2016), the authors reported results of a confirmatory factor analysis as follows: $CFI = 0.93$, $RMSEA = 0.054$ and $SRMR = 0.55$.

Emotional assets (positive affect and self-regulation)

Positive affect was operationalised using the 10 items from the Positive and Negative Affect Schedule (Watson et al., 1988), while self-regulation was measured using the 31-items Short Self-Regulation Questionnaire (SSRQ) (Carey et al., 2004). Both scales were deemed reliable for use in the present sample (Positive Affect, $\alpha = .85$; Self-Regulation, $\alpha = .93$). Previous researchers (Mihic et al., 2014) found the PANAS to be a valid measure, with the

following goodness-of-fit statistics: $RMSEA = 0.05$; $SRMR = 0.04$ and $CFI = 0.97$. In terms of the validity of the SSRQ, the following fit statistics point to a valid measure (Šebeňa et al., 2018): $GFI = 0.763$, $CFI = 0.720$, and $RMSEA = 0.086$.

Behavioural assets (authentic functioning and problem solving)

The 16-item Authentic Inventory Questionnaire, developed by Kernis and Goldman (2006) was used to operationalise authentic functioning. It consists of four dimensions (4-items each) and was found to be reliable in the present sample: self-awareness ($\alpha = .86$), balanced processing ($\alpha = .59$), rational transparency ($\alpha = .84$), and internal moral perspective ($\alpha = .91$). In an attempt to study authentic functioning, Leroy et al. (2015) investigated the validity of the Authentic Inventory Questionnaire. According to Leroy et al. (2015), a confirmatory factor analysis on these dimensions showed a good fit to the data: $\chi^2(71) = 87.03$, $p = 0.09$, $SRMR = 0.03$, $RMSEA = 0.04$, $CFI = 0.99$.

The 35-item Problem Solving Inventory (PSI) (Heppner, 1988) was employed to measure problem-solving. The latter scale consists of three dimensions with acceptable reliabilities observed in the present sample (problem-solving confidence = 11 items, $\alpha = .82$; approach-avoidance style = 16 items, $\alpha = .86$; and personal control = 5 items, $\alpha = .75$). In terms of validity, Kourmoussi et al. (2016) reported the following goodness-of-fit for the PSI: $RMSEA = 0.030$, $CFI = 0.97$ and $GFI = 0.96$ indicating the scale has a good fit.

Procedure and analyses

Ethical clearance was obtained from the Economic and Management Sciences research ethics committee

(University of the Free State, Bloemfontein, South Africa, UFS-HSD2017/0035), while gatekeeper permission to conduct the study was also obtained from the four higher education institutions included in the study. With assistance from the respective Human Resource (HR) Departments, an email containing the link to the electronic survey, the letter of informed consent, participant's information letter and ethical clearance letter was sent out to all female leaders who met the criteria for this study. Female leaders who agreed to participate in this study were asked to provide consent electronically.

Partial least squares structural equation modelling (PLS-SEM) was used to model the structural relationships derived from the literature review – more specifically, the three indirect relationships as depicted in [Figure 1](#). SmartPLS was used to test the structural model proposed in the current study (Ringle et al., 2015). Although three indirect effects are proposed, the mediation analyses were conducted simultaneously using a single model depicting all three the indirect effects. When evaluating variance-based structural models using Smart-PLS, a two-step process is suggested (Hair et al., 2019). Firstly, the outer model (i.e., measurement model) should be evaluated against several quality criteria: average variance extracted (AVE) should be .50 and higher with values associated with the Composite Reliability being .60 and higher (Hair et al., 2019).

Secondly, the inner model (i.e., structural model) should be evaluated in terms of the path coefficients and the extent to which these are statistically significant. When mediation is also to be investigated, then bootstrapping must be employed to determine whether the indirect effects are statistically significant (Hair et al., 2019).

The present study also employed a combination of PLS-SEM criteria (Chin et al., 2020) to compare the explanatory power associated with the three indirect effects – in essence comparing three different models each representing a mediating effect. Both in-sample (Hair et al., 2017) and out-of-sample (Shmueli et al., 2019) criteria were used. More specifically, the following in-sample criteria were consulted: R^2 , Adjusted R^2 , Akaike Information Criterion (AIC) and Corrected Akaike Information Criterion (AICc). The model with the highest R^2 and adjusted R^2 could be deemed as the most preferable, whereas the model with the lowest AIC and AICc would be viewed as the better model. As a guide, R^2 values of 0.75, 0.50, and 0.25 can be considered as substantial, moderate and weak respectively (Hair et al., 2011). In addition, the following out-of-sample metrics were consulted: Root Mean Square Error

(RSME) and mean absolute error (MRE). The latter two metrics provide information relating to degree of prediction error associated with a particular model (Shmueli et al., 2019). The model resulting in the least amount of prediction error would be deemed the most preferable.

Results

Common method bias

It is possible to investigate common method bias using a partial least squares approach to structural equation modelling by inspecting the values associated with the inner variance inflation factors (VIF) (Kock, 2015). It is evident from [Table 1](#) that there is no evidence of common method bias, with all the inner variance inflation factors being below the recommended value of 3.3 (Kock, 2015).

Outer model

It is evident that all the latent variables met the suggested criteria in terms of both composite reliability and average variance extracted (see [Table 2](#)). It must be noted that the balanced processing and internalised moral perspective dimensions of authentic functioning were not retained in the outer model. Although both these indicators had significant loadings on the latent variable, they were both low (–.427 and .327). Hence, they were removed from the outer model. In short, all the remaining indicators (i.e., dimensions associated with each of the latent variables) had significant loadings on their respective latent variables (see [Table 3](#)). Given the fact that the AVE values associated with the different latent variables met the quality criteria, it seems plausible that the indicators associated with each of the latent variables represent the same underlying construct (Henseler et al., 2009). It should be noted that resilience, being a unidimensional construct, was measured using a composite score (hence, the value of 1 for both AVE and composite reliability). Based on the results associated with the outer model, it is clear that the measures to be used in evaluating the different hypotheses are both reliable (looking at composite reliability) and valid (looking at the AVE).

Inner model

From [Table 4](#), it is evident that the majority of the proposed paths in the model are statistically significant, except the path between cognitive assets on resilience

(i.e., direct effect). The proposed model explained 38% of the variance in resilience.

Indirect effects

When looking at Table 5, all three indirect effects are statistically significant. Given that the direct effect is not significant (see Table 4), the present study concludes that there is evidence of full mediation which provides support for H1, H2, and H3. In short, emotional and behavioural assets (in parallel and serial) mediate the relationship between cognitive assets and resilience. It is interesting to note that emotional assets have the strongest mediating effect on the relationship between cognitive assets and resilience, compared to the remaining indirect effects.

Model comparison

To further investigate the mediating effects reported above, the present study opted to treat them as separate models for the purposes of model comparison using model fit statistics: Model 1 represents behavioural assets as the mediator, Model 2 represents emotional assets as the mediator, and Model 3 represents both behavioural and emotional assets (in serial) as mediators. From Table 6, it is evident that both Model 2 AND Model 3 are the preferred models in terms of the amount of variance explained (R^2 and Adjusted R^2). Model 1 has the lowest AIC value, whereas Model 3 has the lowest AICc value. There seems to be not much difference when comparing the amount of prediction error across the three models. In short, different criteria point to either Model 2 or Model 3 being preferable.

Table 1. Common method bias (inner variance inflation factors).

	Behaviour	Cognition	Emotion	Resilience
Behaviour		2.332	1.946	2.491
Cognition	1.682		1.762	1.846
Emotion	2.042	2.562		2.336
Resilience	1.584	1.599	1.461	

Table 2. Quality criteria (outer model).

	Composite Reliability	Average Variance Extracted (AVE)
Behaviour	.71	.534
Cognition	.797	.663
Emotion	.861	.757
Resilience	1	1

Discussion

The present study set out to determine the mediating effect of emotional and behavioural assets (both in serial and in parallel) on the relationship between cognitive assets and resilience of female leaders in higher education. Although there is ample empirical evidence supporting the relationship between cognitive assets and resilience, the present study found that having high levels of self-efficacy and mindfulness (both cognitive assets) on their own does not influence resilience.

The present study found that each of the indicator variables had significant loadings on their respective latent variables. In addition, it was found that these indicators explained a sufficient proportion of the variance associated with each of the latent variables. Conceptually, this implies that positive affect and self-regulation (i.e., indicators/components) are related to emotional assets. The same conclusion is arrived at for the indicators associated with cognitive assets and behavioural assets. In short, these findings provide support for the conceptual arguments put forward regarding the components associated with the different assets that can influence the levels of resilience among women leaders.

Although all the three proposed indirect effects were statistically significant, behavioural assets (on their own) seem to play a less important role in understanding how cognitive assets influence the levels of resilience of female leaders in higher education. The results of the present study indicate that the models representing the two indirect pathways in which emotional assets were present, explained more of the variance in resilience than the model where only behaviour is included. More specifically, the model with emotional assets as the mediator explains almost the same amount of variance (37%) in resilience compared to the model where both emotional and behavioural assets (in serial) act as mediators (38%). This points to the importance of emotional assets (either separately or in combination with behavioural assets) when trying to explain the complex relationship between cognitive assets and resilience. Wang et al. (2016), explain that emotional assets display a stronger association with resilience than cognitive or behavioural assets because individuals who possess a greater level of emotionality are better equipped to discriminate between positive and negative emotions and are able to notice specific information related to that emotion, such as its origin. This places them in a better position to deal with destructive emotions and as a result, they are more resilient. Additionally, being able to regulate and being aware of emotions may have a significant influence on cognitive processes such as beliefs, attention and perceptiveness.

Table 3. Outer loadings.

	Original Sample (O)	Standard Deviation (STDEV)	T Statistics (O/STDEV)	P Values
Approach Avoidance Style <- Behaviour	.784	.03	26.499	.000
Generalised Self-Efficacy <- Cognition	.853	.023	37.49	.000
Mindfulness <- Cognition	.773	0.039	20.054	.000
Positive Affect <- Emotion	.832	.028	29.618	.000
Personal Control <- Behaviour	.806	.024	33.275	.000
Problem-solving Confidence <- BEH	.749	.039	18.98	.000
Rational Transparency <- BEH	-.623	.054	11.545	.000
Self-Awareness <- Behaviour	.675	.035	19.05	.000
Self-Regulation <- Emotion	.907	.011	85.534	.000
Resilience <- Resilience	1	0		

Table 4. Inner model (path coefficients).

	Original Sample (O)	Standard Deviation (STDEV)	T Statistics (O/STDEV)	P Values
Behaviour -> Resilience	.175	.092	1.904	.029
Cognition -> Behaviour	.294	.056	5.272	.000
Cognition -> Emotion	.624	.039	16.039	.000
Cognition -> Resilience	.104	.069	1.498	.067
Emotion -> Behaviour	.565	.048	11.732	.000
Emotion -> Resilience	.4	.084	4.742	.000

Table 5. Specific indirect effects.

	Original Sample (O)	Standard Deviation (STDEV)	T Statistics (O/STDEV)	P Values
C -> E -> B -> R	0.062	0.033	1.868	0.031
C -> E -> R	0.250	0.057	4.361	0.000
C -> B -> R	0.051	0.03	1.731	0.042

C = Cognition; E = Emotion; B = Behaviour; R = Resilience.

Table 6. PLS-SEM criteria values for alternative models 1-3.

	Criteria	Model 1 (Behaviour)	Model 2 (Emotion)	Model 3 (Serial)
Asymptotically Efficient (model selection criteria)	AIC	-91.934	-113.206	-115.714
	AICc	165.226	143.954	141.527
PLS Based (in-sample prediction)	R ²	.316	.371	.382
	Adjusted R ²	.311	.366	.375
PLSpredict (out-of-sample prediction)	RMSE	.897	.897	.900
	MAE	.705	.703	.706

AIC = Akaike Information Criterion; AICc = Corrected Akaike Information Criterion; RMSE = Root Mean Square Error; MAE = Mean Absolute Error.

capacities and ultimately may influence how one responds to stressful events (Pillay et al., 2022).

Emotional assets (self-regulation and positive affect) seem to play a crucial role when trying to explain how cognitive assets (mindfulness and self-efficacy) influence the levels of resilience of female leaders in higher education. Mindfulness can be interpreted as a form of self-regulation directed towards one's attention and awareness. This self-regulation of attention emphasizes

an open-minded and non-discursive awareness of observations, sensations, thoughts, and emotions. In addition, when the individual believes they are capable of dealing with challenges and barriers, this belief increases positive affect (Borrachero et al., 2013; Caprara et al., 2006). Thus, being aware and mindful of one's emotions and thoughts, as well as having the self-confidence in regulating those emotions and thoughts will likely lead to an experience of positive emotions in

the face of adversity, resulting in higher levels of resilience. In short, being able to self-regulate oneself and one's emotions may enhance an individual's perceptions of having control over stressful events, leading to increased levels of resilience (Evans et al., 2009).

The present study also found that both emotional and behavioural assets (in serial) have a mediating effect on the relationship between cognitive assets and resilience. The individual's positive appraisals brought about by cognitive assets (e.g., being more self-aware about one's strengths and weaknesses and having self-confidence in dealing with challenging situations) may positively influence emotions (e.g., positive affect) and behaviour (either in the form of more appropriate problem-solving approaches and/or allowing the individual to exhibit behaviours that are consistent with the true self), thus ultimately facilitating resilient outcomes (Leroy et al., 2013; Padesky & Mooney, 2012). The cognitive behavioural perspective emphasises the dynamic interaction between cognitive, emotional and behavioural internal processes and the effect on resilient responses.

Implications

The findings of this study provide insight into the processes that foster resilience amongst women leaders in higher education institutions. The results shed light on the importance of emotional assets in the resilience process and may serve as guidelines for leadership development programmes that focus on enhancing resilience amongst women leaders. While the greater systemic barriers that continue to hinder women's leadership progression are acknowledged in this paper, the results of the study and by extension the practical implications, are limited to the main aim i.e., to investigate the indirect processes through which cognitive, emotional and behavioural assets function to explain resilience amongst women leaders in higher education institutions. As a result, the practical implications focus on discussing possible ways women leaders can strengthen their emotional assets.

Enhancing emotional assets and resources could play a significant role in fostering resilience and this can be done through increasing mindfulness and other related character strengths that emphasise emotionality. Organisations can invest in Mindfulness-Based Strengths Programmes (Itzvan et al., 2016) which combine both mindfulness practices and character strengths awareness to foster a range of positive outcomes including greater self-regulation and positive

emotions. Additionally, organisations can appoint coaches and mentors to work with female employees who are currently in leadership roles or who display potential for leadership roles in the future. Coaches and mentors can customise appreciative inquiry initiatives which will assist in increasing positive affect (Pillay et al., 2022; Rogers & Fraser, 2003). These approaches encourage individuals to identify positive aspects in stressful experiences which fosters positive emotions. Coaches and mentors can also work with female leaders to set career goals and encourage the regulation of emotions and behaviour towards the achievement of those goals.

Limitations

While the study highlighted the importance of resilience as a psychological strength for women leaders, it must be noted that resilience is only one factor that can assist in minimising the underrepresentation of female leaders. Resilience is an important factor that plays a role in women leadership success but certainly does not address the root cause of the problem, which are the systemic barriers, discussed in this paper. If an effort is made to truly move the fight for female leadership progression forward, it must also focus on addressing these systemic issues. The current study opted for a micro-level approach to understanding resilience processes amongst women leaders. While this was in line with the purpose of the study, there are many researchers who argue that adopting a macro level or socio-ecological approach might offer a more holistic understanding of resilience. Future researchers are encouraged to explore protective factors of resilience that originate externally to determine whether they are as effective as internal assets.

Conclusion

Through exploring the role of internal processes in explaining resilience, this study offers empirical evidence supporting the importance of emotions in fostering resilience. The application of the cognitive behavioural theory to explain resilience amongst women leaders in higher education also makes this study one of the very few studies to utilise the theory within the work context. This study also contributes towards literature emphasising the importance of emotional intelligence for leaders since it indicates that resources such as self-regulation and positive affect

(both aspects of emotional intelligence) appear to play a significant role in the resilience of female leaders.

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

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Data availability statement

The data that support the findings of this study are available from the corresponding author, [DPN], upon reasonable request.

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