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Frontline service innovation within an agricultural retail, trade and services organisation

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Authors:
Marietjie
Nieder-Heitmann[1] ⓘ
Dirk J. Malan[1] ⓘ

Affiliations:
[1]Department of Industrial Psychology, Faculty of Economic and Management Sciences, Stellenbosch University, Stellenbosch, South Africa

Corresponding author:
Dirk Malan,
djmalan@sun.ac.za

Purpose: A review of the literature on service innovation revealed that several contributing factors may facilitate service innovation among frontline employees. The purpose of this article was to explore and empirically evaluate a theoretical model identifying the antecedents of frontline service innovation among frontline employees within an agricultural retail, trade and services organisation within the Western Cape.

Design/methodology/approach: A quantitative data gathering method was employed in the current study. Paper-and-pencil questionnaires were utilised to gather data from 150 frontline employees working within an agricultural, trade and services organisation within the Western Cape.

Findings/results: The results confirmed that both Emotional Intelligence and Creative Self-Efficacy had a significant direct relationship with Frontline Service Innovation, and Creative Self-Efficacy mediated the relationship between Empowering Job Characteristics and Frontline Service Innovation. In addition, the relationships between Empowering Leadership and Innovative Organisational Climate, Empowering Job Characteristics and Creative Self-Efficacy, Empowering Job Characteristics and Psychological Ownership and Empowering Job Characteristics and Psychological Safety was established as being significant, while Innovative Organisational Climate significantly mediated the relationship between Empowering Leadership and Psychological Safety.

Practical implications: These findings equip organisations with the knowledge to facilitate the development of frontline service innovation on multiple organisational levels and lead the way for future research on this topic.

Originality/value: The current study contributed towards the conceptualisation of the construct of Frontline Service Innovation and towards the development of an instrument that measures this construct.

Keywords: frontline service innovation; frontline employees; Western Cape; agricultural retail; trade and services organisation.

Introduction

Research on innovation in the services industry is limited, and it is only as the Gross Domestic Profit (GDP) of services sectors in most developed countries has started to exceed that of manufacturing that the need for research has increased. Apart from the dramatic growth in services, the continuous increase in business competition justifies more research on the occurrence and reinforcement of innovative behaviour on the individual frontline level (Nieder-Heitmann, 2019).

The South African agricultural industry is deemed a vital economic sector because of its contribution to food supply and security, job creation and maintenance of the country's trade balance (South African Government, Department of Agriculture, Forestry and Fisheries, 2012). With the changes in the current domain of the agricultural retail, trade and services organisations (former agricultural cooperatives), together with the younger generation of farmers coming of age, customer retention, loyalty and patronage may become more challenging. Thus, the role of frontline employees within South African agricultural retail, trade and services organisations should not be underestimated, and these organisations are urged to invest in 'the face of their company'. Innovation may be one of the pillars that could enhance the service offering and customer experience and, as such, strengthen the relationship between the frontline employee and the farmer-customer (Nieder-Heitmann, 2019).

Rationale for the current study

The customer interface presents the employee with an opportunity to either build and strengthen the customer's emotional ties with the organisation or demolish it. Even though employee interactions are not the only means by which organisations strengthen these emotional ties with customers, they represent a resource that is often untapped.

Bettencourt advises that service innovation should commence with the realisation that 'services are solutions to customer's needs' (Bettencourt, 2010, p. xxi). Accordingly, the author suggests that, before an organisation can customise its services or generate ideas to address its customer's needs, such needs have to be understood. Yet, contemporary organisations still take a backward approach to service innovation. They tend to generate the idea before they have clarified the need. Service innovation is thus an end and not a means to an end.

The key characteristic of the frontline employee's job is heterogeneity (Slåtten et al., 2011; Sousa & Coelho, 2011) because each customer's needs are unique and their demands are diverse. Frontline employees are often required not only to address the underlying needs but also to find creative means to uncover such needs. It is imperative for the frontline employee to determine and understand the customer's needs and the customer's perception of what constitutes satisfactory service and, as such, adjust their customer interactions accordingly (Lages & Piercy, 2012).

Frontline employees are faced with the constant challenge of how to behave while interacting with the customer by offering personalised and customised service that will result in a positive service experience for the customer. The rationale of the current study was to investigate which characteristics, on various organisational levels, will typically activate and promote innovative service among frontline employees within agricultural retail, trade, and services organisations. The choice to focus on organisations in the Western Cape was purely based on accessibility and the logistical challenges associated with a broader focus, given the limited nature of the research project (Nieder-Heitmann, 2019).

Research objectives

It is in this light that the following research goal for the study was formulated: to investigate and empirically test a theoretical model representing antecedents of frontline service innovation among frontline employees employed by an agricultural retail, trade and services organisation within the Western Cape.

Subsequently, the following objectives were formulated:

- To identify the most salient antecedents of frontline service innovation among employees employed by an agricultural retail, trade and services organisation operating in the Western Cape.

- To propose and test an explanatory frontline service innovation structural model.
- To confirm the managerial implications of the research findings and recommend practical interventions to increase frontline service innovation among frontline employees employed by an agricultural retail, trade and services organisation operating in the Western Cape.

Literature review

A general overview of the extant research on multi-level innovation within organisations and the in-depth exploration of key antecedents of frontline service innovation on the individual level served as a preliminary platform from which hypothesised interrelationships among the latent variables were derived. These proposed interrelationships will subsequently be elaborated on.

Psychological ownership and frontline service innovation

Psychological ownership is a psychological phenomenon that denotes an individual's feelings of possessiveness towards a target (Van Dyne & Pierce, 2004). Within an organisational context, the individual's job is a natural target towards which feelings of ownership tend to develop (Brown et al., 2014). This is referred to as job-based psychological ownership, and this is the construct that will be measured in the current study.

Frontline service innovation consists of the following three dimensions: (1) *Identifying Customers' Needs*, (2) *Innovation* and (3) *Adaptive Service Offering*. The first dimension, *Identifying Customers' Needs*, is defined as the frontline employee's ability to accurately and effectively delineate and interpret the customer's needs while engaging with him or her. The second dimension, *Innovation*, is defined as the frontline employee's ability to find creative solutions for his or her customers' problems. The last dimension, *Adaptive Service Offering*, refers to the frontline employee's ability to adapt or change his or her service approach to ensure he or she meets the customer's need or solves his or her problem (Nieder-Heitmann, 2019).

Sieger et al. (2013) found that psychological ownership leads to positive attitudinal and behavioural organisational effects and includes increased affective commitment, extra-role behaviour, organisational citizenship behaviour, job satisfaction and reduced workplace deviance. In similar vein, Van Dyne and Pierce (2004) regard a sense of ownership as important for service employees who have direct customer contact.

Most frontline service jobs allow for some degree of discretionary behaviour, which gives frontline employees the opportunity to exercise control, gain knowledge and personally invest in their work, which are all likely to cultivate positive feelings of psychological ownership (Van Dyne & Pierce, 2004). Frontline employees who hold a strong sense of psychological ownership towards their job are expected to exercise control over the situation as they would

typically regard the customer and their problems or needs to be 'theirs'. Accordingly, the current researchers proposed that a frontline employee with a strong sense of psychological ownership would go to great lengths (make personal sacrifices and exert extra effort) to satisfy a customer's demands or exceed their expectations in order to build a strong, longstanding relationship with the customer (Nieder-Heitmann, 2019).

H1: Psychological ownership is positively related to frontline service innovation.

Psychological safety and frontline service innovation

Psychological safety is considered the 'extent to which members of an organi[s]ation feel psychologically safe to take risks, speak up and discuss issues openly' (Kark & Carmeli, 2008, p. 793). This definition thus refers to the individual's perceptions of the likely consequences of interpersonal risk-taking within his or her organisation (Kark & Carmeli, 2008). Edmondson et al. (2016) claim that psychological safety is vital in assisting employees to learn and change their behaviour, especially in interpersonally challenging occupational environments. Psychological safety influences the way in which individuals engage in their work and their ability to adjust their professional approach Khan (1990). Even though the individual is willing to alter their interpersonal approach, their perceptions about the possible risk may inhibit their motivation to act on such an intention (Edmondson et al., 2016). Mavrokordatos (2015) postulates that when an individual feels a sense of support for experimentation, where risk and error are considered part and parcel of learning, the individual will be more likely to take initiative. Edmondson and Lei (2014, p. 31) believe that a psychologically safe environment 'enables divergent thinking, creativity, and risk-taking and motivates engagement in exploratory and exploitative learning, thereby promoting performance'.

The frontline employee, especially in a multi-cultural South Africa, must deal with a diverse clientele. Every customer has different beliefs, perceptions, assumptions and value systems, which ultimately dictate their behaviour. Because of the heterogeneous nature of the frontline employee's work (varying customer behaviours, needs and service expectations), the frontline employee is left with the challenging task of continuously adapting to newness and acting thereupon. Frontline employees who perceive their workplace as supportive with regard to experimenting with service initiatives and experience latitude for error will be more likely to take personal risks and consider creative alternatives (Nieder-Heitmann, 2019).

H2: Psychological safety is positively related to frontline service innovation.

Psychological safety, creative self-efficacy and psychological ownership

Self-efficacy scholars distinguish between job self-efficacy and creative self-efficacy. Job self-efficacy refers to one's beliefs about one's competence with regard to task performance across multiple domains, whereas creative self-efficacy is creativity specific and refers to one's beliefs about one's competence with regard to creative performance (Hammond et al., 2011; Tierney & Farmer, 2002).

The research of Abror et al. (2016) showed that there is a positive relationship between psychological safety and self-efficacy in Indonesian companies. Psychological safety is predominantly embedded in organisational development and change theory (Edmondson, 1999), which predicts learning behaviour within organisations. Employees who feel that the organisation tolerates risk taking and failure are more likely to display such behaviour, learn from their mistakes and subsequently develop their professional skills. Edmondson et al. (2016, p. 66) suggest that 'high psychological safety can catalyse a positive self-fuelling cycle for adult development'. Accordingly, knowledge acquisition and experience are likely to lead to improved work performance, which will most probably reinforce the employee's belief in his or her capability to successfully perform the job, or in this instance, creative capabilities.

According to Stander and Coxen (2017), psychological ownership is associated with the need for self-efficacy and control, a sense of identity and also the need for security.

Nwanzu and Babalola (2022) found that both psychological ownership and creative self-efficacy correlated positively with employee creative performance and that creative self-efficacy moderated the effect of psychological ownership on creative employee performance. They defined creative self-efficacy as 'a person's self-judgment of competence to suggest new and appropriate ideas, find creative solutions and perform creative behavio[u]r' (p. 3). The impact of psychological ownership on employee creative performance was higher when creative self-efficacy was high. The current researchers postulated that the frontline employee who truly believes in his or her ability to display innovative work performance will be more likely to accept ownership of his or her job responsibilities.

It is consequently hypothesised that the frontline employee, whose sense of psychological safety is intact, will presumably develop positive beliefs about his or her creative performance and assume increased psychological ownership of his or her job functions and consequently be more inclined to present innovative solutions and take the risk of implementing such solutions (Nieder-Heitmann, 2019). Against this background, the following hypotheses are proposed:

H3: Psychological safety is positively related to creative self-efficacy.

H4: Creative self-efficacy is positively related to psychological ownership.

H5: The relationship between psychological safety and psychological ownership is mediated by creative self-efficacy.

Empowering leadership, psychological safety and innovative organisational climate

The construct of empowering leadership is the frontline employee's perception that his or her direct manager or supervisor gives them the freedom to seek and implement creative solutions within the frontline service context. A work environment free from the threat of job loss and the pressure of increased productivity generally lays a solid foundation whereupon psychological safety can be anchored (Belfont, 2016). Psychological safety generally appears to be present in climates that promote risk taking, learning and innovation (Kark & Carmeli, 2008). Leadership is often regarded to be one of the most influential constructs when it comes to organisational climate studies (Cloete, cited in Eustace & Martins, 2014). Carmeli et al. (2010) state that psychological safety is generally determined by the leader because of the climate that he or she creates and the extent to which they are receptive to novelty, risk and ambiguity. Mavrokordatos (2015) found that inclusive leadership has a significant effect on psychological safety. Edmondson et al. (2016) suggest that psychological safety is more enhanced when the status gap between the leader and the subordinate is deliberately narrowed by the leader, when the leader facilitates a mutually supportive approach, with acceptance and respect.

The current researchers postulated that a frontline employee whose supervisor or line manager creates an interpersonal work environment that is open, supportive and provides a degree of freedom in terms of innovativeness will be more inclined to experience feelings of interpersonal safeness, wherein his or her actions or interpersonal risk taking is free from destructive appraisal (Nieder-Heitmann, 2019). Against the foregoing, the following hypotheses are presented:

> **H6:** Empowering leadership is positively related to innovative organisational climate.
>
> **H7:** Empowering leadership is positively related to psychological safety.
>
> **H8:** The relationship between empowering leadership and psychological safety is mediated by innovative organisational climate.

Empowering leadership, innovative organisational climate and psychological ownership

The relationships between various leadership styles or approaches and psychological ownership have been widely researched. Li (2008) investigated the relationship between different leadership styles, perceived control and psychological ownership of the job. The results indicated that a participative leadership style is positively related to perceived control (i.e. autonomy), and perceived control is positively related to psychological ownership. Alok (2014) researched the link between authentic leadership and psychological ownership and found that authentic leadership is positively related to organisation-based promotive psychological ownership. In similar vein, Khan et al. (2020) found that inclusive leadership facilitated project success

through psychological empowerment and psychological safety as mediators.

Stander and Coxen (2017) claim that empowering leadership is significantly correlated with psychological empowerment. By giving their employees sufficient authority and increased responsibility to manage their own work, their employees feel free to experiment, solve problems, engage in independent decision-making and innovate. Van Dyne and Pierce (2004, p. 455) suggested that managers or supervisors should allow their frontline employees 'the opportunity to exercise control, acquire knowledge, and personally invest in their work'. Bahr (2016) is of the opinion that by empowering frontline employees to manage some customer service issues on their own or to trust the frontline employee with the freedom to serve the customer the way they think best could boost the frontline employee's confidence and lead to outstanding customer service. Moreover, she believes that the 'but-we've-always-done-it-this-way approach' to customer interactions not only dehumanises frontline staff but also reduces customers' respect for the frontline employee.

With regard to the association between innovative organisational climate and psychological ownership, Mayhew et al. (2007) suggest that organisation-based psychological ownership is generally influenced by a myriad of factors, among which organisational climate tends to be an important construct. Schirle (2016) argues that the theory of psychological ownership is indicative of the psychological influence that the work environment has on an employee. She claims that work environments that cultivate high psychological ownership tend to lead to improved work performance and an increase in production outputs. Frontline employees who perceive an organisational climate within which a premium is placed on innovation may identify stronger with their job role and are subsequently more likely to accept job-based psychological ownership.

Because of the frontline employee's central role in ensuring customer satisfaction and loyalty and enhancing the organisation's competitive advantage, it is in management's interest to invest energy in these individuals and to create a work environment where perceived ownership of the job function and accountability for customer retention is fostered. Managers should therefore exhibit empowering leadership by broadening their interactive relationship with frontline employees from a restricted focus on operational routine work to a broader focus where they encourage employee self-determination, participative decision-making and autonomous work performance (Nieder-Heitmann, 2019). The following hypotheses may now be proposed:

> **H9:** Empowering leadership is positively related to psychological ownership.
>
> **H10:** Innovative organisational climate is positively related to psychological ownership.
>
> **H11:** The relationship between empowering leadership and psychological ownership is mediated by innovative organisational climate.

Emotional intelligence and frontline service innovation

Schutte et al. define emotional intelligence as the 'perception, understanding, expression, regulation and harnessing of emotion in the self and others' (cited in Jonker & Vosloo, 2008, p. 24). According to Jena and Goyal (2022), emotionally intelligent employees are not just self-aware, collaborative, empathetic, articulative, open-minded and motivated, but they are also highly adaptive. They are inherently flexible, handle change well and adjust efficiently to constantly altering circumstances.

Boxer and Rekettye (2011) found that emotional intelligence and innovation in service are significantly related. Accordingly, it will be to the benefit of an organisation to appoint, or alternatively upskill, frontline employees who are more connected with their emotions and have the skill to identify the feelings of another individual during interpersonal interactions. Boxer and Rekettye (2011, p. 227) believe that such employees will 'tie their customers with a very strong emotional bond'.

The current researchers hypothesised that the quality of the innovative interaction at the customer interface is closely linked to the frontline employee's level of emotional intelligence. This interaction is viewed as the intelligent utilisation of emotion by the frontline employee, which subsequently enables the employee to correctly identify the customer's needs and adapt his or her emotion and problem-solving approach accordingly (Nieder-Heitmann, 2019).

> **H12:** Emotional intelligence is positively related to frontline service innovation.

Empowering job characteristics, creative self-efficacy and frontline service innovation

The construct of psychological empowerment has undergone extensive research, and the conclusion could be drawn that complex job designs lead to individual-level psychological empowerment within the workplace. Psychological empowerment includes various dimensions (i.e. meaning, value of work, competence, personal mastery, self-efficacy, an effort-performance expectancy, self-determination, perception of autonomy and influence on work outcomes), which in turn have a positive impact on employee intrinsic motivation, job satisfaction, organisational commitment and organisational citizenship behaviour (Pierce et al., 2009).

Judeh (2012) assessed the effect of empowering job characteristics on self-efficacy and job performance. The results demonstrated that all dimensions of job characteristics (skill variety, task identity, task significance, autonomy and feedback) contributed to the positive impact of job characteristics on self-efficacy and job performance, respectively, but failed to offer support for the correlation between self-efficacy and job performance. Slåtten (2014), however, found that creative self-efficacy mediated the effect of job-related factors on innovative outcomes. Based on

Coelho and Augusto's (2010) research, there appears to be a positive association between four of Hackman and Oldham's five job characteristics (job autonomy, skill variety, feedback and task identity) and the creative behaviour of frontline employees. Therefore, one could reasonably expect that empowering job characteristics, which consist of Hackman and Oldham's five job characteristics, should positively impact a frontline employee's demonstration of frontline service innovation.

As the pioneers of creative self-efficacy research, Tierney and Farmer (2002) found that creative self-efficacy predicted creative performance above and beyond the effects of job self-efficacy. According to a study conducted by Hsu et al. (2011), employees, within a service setting with a high level of creative self-efficacy, displayed a high level of innovative work behaviour. They believe that service employees are compelled to demonstrate innovative behaviour as a result of interaction (handling customer complaints and solving customer problems) with customers.

The current researchers predicted that those frontline employees who have confidence in their innovative ability will cope better with uncertainties (service problems) and failures and will more readily adapt to challenging interpersonal situations. Moreover, it was proposed that the prevalence of high job autonomy, task identity, feedback, skill variety and task significance in the frontline employee's job design will lead to an increased level of creative self-efficacy, which in turn will strengthen the relationship between the empowering job characteristics and frontline service innovation. In the current study, job characteristics have been defined as empowering job characteristics as it is seen as empowering the frontline employee to engage in frontline service innovation behaviour directly or indirectly (Nieder-Heitmann, 2019). Against the foregoing background, the following hypotheses can be formulated:

> **H13:** Empowering job characteristics is positively related to creative self-efficacy.

> **H14:** Creative self-efficacy is positively related to frontline service innovation.

> **H15:** The relationship between empowering job characteristics and frontline service innovation is mediated by creative self-efficacy.

Empowering job characteristics, psychological ownership and psychological safety

Pierce et al. (2009) state that the individual-level effect of work design, with specific reference to the psychological impact thereof, has not received extensive empirical attention. They recommend that Hackman and Oldham's Job Characteristics Model be revised and that the mediating psychological states of experienced meaningfulness of work, experienced responsibility for work outcomes and knowledge of result should be replaced with psychological ownership. Lee and Song (2014) investigated the relationships between job characteristics and service quality and the mediating effect of psychological ownership between these two

constructs. The findings revealed that there is, firstly, a positive relationship between job characteristics and psychological ownership; secondly, a positive relationship between psychological ownership and service quality and thirdly, a positive correlation between job characteristics and service quality. Finally, they found that psychological ownership had a partially mediating effect on the relationship between job characteristics and service quality. Trang (2022) also found that all the job characteristics (except for skill variety) are positively related to affect job-based psychological ownership.

Elsbach and Hargadon propose that three psychological states (positive affect, psychological safety and cognitive capacity) are important intervening constructs between job design and creativity (cited in Pierce et al., 2009). Frazier et al. (2017) did a meta- analytic review of the psychological safety construct, covering 136 samples with more than 22 000 individuals and almost 5 000 groups and found evidence that psychological safety is positively related to the work design characteristics of autonomy, interdependence, and role clarity, and that psychological safety is also positively related to a work context that is supportive.

It was thus proposed that a frontline employee whose job is designed in such a way as to allow the job incumbent to utilise his or her own discretion to render a complete service (from enquiry to solution implementation), to receive sufficient feedback (i.e., supervisory feedback and customer feedback), to perceive to have a significant impact on the life of another individual, to present task variety, would take increased psychological ownership of his or her job and feel 'safe' enough to take initiative during the service delivery process (Nieder-Heitmann, 2019). The following hypotheses can thus be formulated:

> **H16:** Empowering job characteristics is positively related to psychological ownership.
>
> **H17:** Empowering job characteristics is positively related to psychological safety.

Figure 1 serves as a graphical illustration of the hypothesised interrelationships between the latent variables (viz. psychological ownership, psychological safety, creative self-efficacy, emotional intelligence, empowering job characteristics, innovative organisational climate, empowering leadership and frontline service innovation).

Research methodology

The current study utilised structural equation modelling to evaluate the hypothesised multivariate causal relationships between the variables in the proposed model. Data of a quantitative nature were collected from 150 frontline service employees who work within the various divisions of an agricultural retail, trade and services organisation within the Western Cape – the sample could be described as a non-probability convenience sample. A paper-and-pencil self-administered questionnaire was distributed to the participants
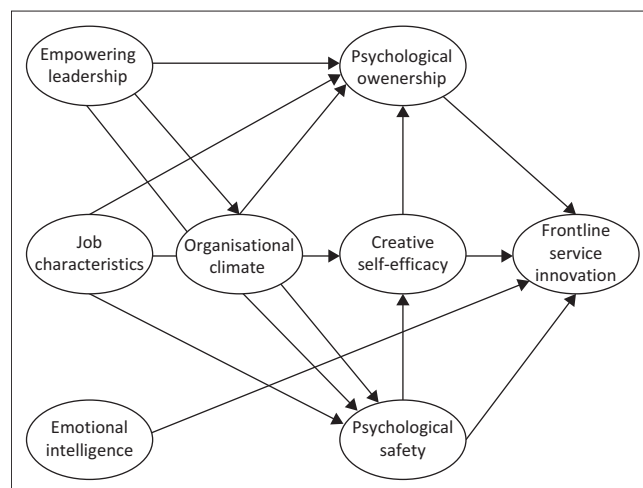
Source: Adapted from Nieder-Heitmann, M. (2019). *Antecedents of frontline service innovation within an agricultural retail, trade and services organisation within the Western Cape.* Master's thesis, University of Stellenbosch. Retrieved from https://scholar.sun.ac.za/handle/10019.1/107296

FIGURE 1: Frontline service innovation theoretical model.

who consented to voluntary participation under strict confidentiality and anonymity measures. In order to overcome the challenges posed by the language abilities of the sample, the items of the eight measuring instruments were translated to Afrikaans by a professional translator and back translated to English to ensure content validity of the Afrikaans items. The questionnaire included the translated Afrikaans version of an item in order to remove any ambiguity regarding the English item.

The various instruments included in the composite survey were:

- The Psychological Ownership Questionnaire (Brown et al., 2014) (six items) with alpha coefficients ranging between 0.93 and 0.94.
- An adapted version of the Edmondson's Psychological Safety Scale (Kark & Carmeli, 2008) (six items) with a Cronbach alpha of 0.76. In a recent validation study, Mahmoud et al. (2022) obtained a Cronbach alpha of 0.81, a composite reliability of 0.87 and an Average Variance Extracted (AVE) of 0.52 for this scale.
- The Creative Self-efficacy Scale (Tierney & Farmer, 2002) (three items) with reliability coefficients ranging from 0.83 to 0.87.
- The Schutte Emotional Intelligence Scale (Jonker & Vosloo, 2008; Schutte et al., 1998) (33 items) with an alpha coefficient of 0.9 for the total scale. In a recent study by Aniemeka et al. (2020), the Cronbach alpha for the scale was 0.9, the item-total correlations ranged between 0.6 and 0.83, and the concurrent validity with the TEIQue-Short Form was confirmed.
- A self-compiled Frontline Service Innovation measure (20 items) of which the psychometric properties were to be determined.
- The Revised Job Diagnostic Survey (Buys et al., 2007) (30 items), with alphas ranging from 0.67 to 0.75 for the various subscales, was used to measure Empowering Job Characteristics. The researcher used the Simple Additive

Index method to derive a Motivating Potential Score (MPS) and thereafter calculated the three Personal Outcomes of Internal Work Motivation, General Job Satisfaction and Growth Motivation.

- An adapted version of the abbreviated KEYS instrument (18 items) was utilised to measure innovative organisational climate (Amabile, 1996). According to Swart (2013), the KEYS obtained a Cronbach alpha of 0.86 and correlated strongly with the Innovative Leadership Questionnaire.
- An adapted version of the Empowering Leadership Scale (Babakus et al., 2003) (five items) with an alpha coefficient of 0.81.

Ethical considerations

Ethical clearance to conduct this study was obtained from the Stellenbosch University Research Ethics Committee Humanities (NO. IPSY-2017-1649).

Results

Descriptive statistics

According to Statistics South Africa (2018), nearly half of the economically active population within the Western Cape consists of people from the so-called mixed race group (47.6%) and more than a third (36.6%) from the black African group. The white population constitutes only 15% and the Indian population 1% of the provincial economically active population (EAP). The descriptive statistics for the current sample are presented in Table 1.

Based on the descriptive statistics in Table 1, the largest portion (79.5%) of the sample consisted of male participants, and the majority (64%) were from the so-called mixed race group. More than a third of the sample group fell within the 31–40 years age group, and grade 12 is the highest level of education for half (50%) of the participants.

Psychometric analyses

Reliability

Table 2 and Table 3 present the results of successive analyses of the internal consistency and reliability of the psychometric instruments.

As reflected in Table 2, not all scales and subscales have Cronbach alphas equal to or higher than the 0.7 reliability limit. *General Job Satisfaction*, a subscale of the *Empowering Job Characteristics* scale, achieved an unsatisfactory level of (0.66) reliability. Moreover, the *Obstacles* subscale of the *Innovative Organisational Climate* fell within the unacceptable range (0.25) and the *Psychological Safety* scale within the poor (0.52) range. The remainder of the scales and subscales showed internal reliability as the Cronbach alphas ranged from 0.7 to 0.93.

The majority of the average inter-item correlations of the various scales and subscales indicated that the average item correlations were within acceptable limits. According to Tebachnik and Tabachnick and Fidell (2013), average

TABLE 1: Sample descriptive statistics.

Item	Category	Frequency	%
Age	18–30 years	46	30.5
	31–40 years	52	34.5
	41–50 years	37	25.0
	51–60 years	13	9.0
	Unknown	2	1.0
Gender	Male	119	79.5
	Female	29	19.5
	Unknown	2	1.0
Highest qualification obtained	Grade 8 or less	6	4.0
	Grade 9–11	22	15.0
	Grade 12	76	50.0
	National certificate	28	19.0
	Diploma	17	11.0
	Unknown	1	1.0
Language	Afrikaans	145	96.0
	Xhosa	1	1.0
	English	2	1.0
	Zulu	1	1.0
	Unknown	1	1.0
Ethnicity	Black (African) people	6	4.0
	mixed race	96	64.0
	White people	37	25.0
	Unknown	11	7.0
Language of completion of questionnaire	English	10	7.0
	Afrikaans	119	79.0
	English and Afrikaans	17	11.0
	Unknown	4	3.0

Source: Adapted from Nieder-Heitmann, M. (2019). *Antecedents of frontline service innovation within an agricultural retail, trade and services organisation within the Western Cape.* Master's thesis, University of Stellenbosch. Retrieved from https://scholar.sun.ac.za/handle/10019.1/107296

inter-item correlations between 0.15 and 0.5 could be regarded as acceptable. It can therefore be inferred from the results that most of the items consistently measured the same construct while still retaining its discriminant validity. In terms of these criteria, the *Emotional Intelligence* (0.15) and the *Psychological Safety* (0.16) scales were borderline, but acceptable, while the *Obstacles* subscale (−0.08) of the *Innovative Organisational Climate* scale clearly did not meet the average inter-item correlation reliability criteria.

In terms of the evidence presented above, the Obstacles subscale was removed from further analyses, but the researchers did not remove the poorer items from the Emotional Intelligence and Psychological Safety measures as that would render the results incomparable with other studies and would unpredictably affect the construct being measured (Nieder-Heitmann, 2019). The Composite Reliability calculations provide further support for the continued use of the instruments. Table 3 displays the Composite Reliability Values (CRV) and AVE of all subscales.

The composite reliability score is indicative of the reliability of the latent variable scales. Generally, the criterion for a satisfactory level of composite reliability is set at 0.7 and higher (Hair et al., 2017). Table 3 indicates that all the composite reliabilities of the latent variables are above 0.7, which adheres to Hair et al.'s (2017) satisfactory guideline.

TABLE 2: Summarised reliability analysis of subscales.

Latent variable	Subscale	Number of items	Mean	Standard deviation	Average inter-item correlation	Standardised Chronbach alpha
Frontline service innovation	Identifying customers' needs	6	37.60	3.42	0.28	0.70
	Innovation	5	29.67	4.34	0.40	0.77
	Adaptive service offering	9	56.42	5.61	0.30	0.79
Psychological ownership	-	6	36.13	7.66	0.61	0.90
Emotional intelligence	-	33	132.51	11.89	0.15	0.85
Empowering job characteristics	Motivating potential	15	86.67	14.51	0.46	0.93
	Internal work motivation	6	36.20	5.31	0.37	0.78
	General job satisfaction	5	25.74	5.94	0.30	0.66
	Growth satisfaction	4	22.48	4.58	0.57	0.84
Innovative organisational climate	Stimulant	10	25.42	5.57	0.32	0.82
	Obstacles	4	10.71	1.97	-0.08	0.25
	Criterion	4	11.26	2.55	0.44	0.75
Psychological safety	-	6	25.68	5.71	0.16	0.52
Creative self-efficacy	-	3	18.25	2.74	0.55	0.78
Empowering leadership	-	5	27.44	6.74	0.57	0.86

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TABLE 3: Composite reliability values and average variance extracted of all subscales.

Scale	Original sample		Confidence intervals			
	CRV	AVE	CRV		AVE	
			2.50%	97.50%	2.50%	97.50%
Frontline service innovation	0.87	0.69	0.82	0.91	0.61	0.76
Psychological ownership	0.93	0.69	0.88	0.96	0.57	0.80
Emotional intelligence	0.87	0.20	0.82	0.89	0.16	0.24
Empowering job characteristics	0.90	0.70	0.87	0.93	0.62	0.76
Innovative organisational climate	0.88	0.79	0.83	0.92	0.71	0.86
Psychological safety	0.71	0.30	0.55	0.77	0.24	0.37
Creative self-efficacy	0.88	0.71	0.83	0.92	0.63	0.80
Empowering leadership	0.89	0.63	0.85	0.92	0.53	0.70

Source: Adapted from Nieder-Heitmann, M. (2019). *Antecedents of frontline service innovation within an agricultural retail, trade and services organisation within the Western Cape*. Master's thesis, University of Stellenbosch. Retrieved from https://scholar.sun.ac.za/handle/10019.1/107296

CRV, Composite Reliability Values; AVE, Average Variance Extracted.

Convergent validity

The AVE is useful for determining the convergent validity at construct level and measures the amount of variance that is captured by a construct in comparison to the amount of variance caused by measurement error (Fornell & Larcker, 1981). Average Variance Extracted values of 0.5 and higher indicate that the indicator variables are indeed measuring the construct it is intended to measure (i.e. the construct explains more than half of the variance of its indicator variables). Average Variance Extracted values lower than 0.5 suggest that most of the variance is ascribed to measurement error in the items as opposed to the variance explained by the relevant construct (Hair et al., 2017).

The information in Table 3 shows that the AVE scores of most of the latent variables are well above the 0.5 threshold. The inference can thus be drawn that these constructs explained more than 50% of the variance in the indicators. For those latent variables that did not meet the 0.5 threshold, like *Emotional Intelligence* and *Psychological Safety*, more of the variance is explained by measurement error in the items than the variance in the construct (when Emotional Intelligence

[EI] subscale scores are used to calculate the total EI score, the AVE rises to 0.54). The low AVE scores could be seen as a constraining factor in the measurement model although low AVE values are generally not an unusual phenomenon in research (Nieder-Heitmann, 2019).

Discriminant validity

The current researchers assessed the measurement model against the heterotrait-monotrait (HTMT) ratio threshold, and all constructs achieved discriminant validity (Alarcón & Sánchez, 2015). It is therefore concluded that the latent variable measures all seem to measure the constructs they were intended to measure.

Evaluation of the item loadings

In the current study, most of the outer loadings were statistically significant as zero did not fall within the 95% confidence interval, and the *p*-values were smaller than the 0.05 level of significance. However, three of the *Emotional Intelligence* scale items (EI1, EI5 and EI28) and two of the *Psychological Safety* scale items (PS1 and PS3) were not significant. The researchers decided to retain these items as their removal would not necessarily improve the reliability of these instruments and the combined measurement model achieved reasonable fit (root mean square error of approximation [RMSEA] = 0.06; goodness of fit index [GFI] = 0.88 and adjusted goodness of fit index [AGFI] = 0.87) (Nieder-Heitmann, 2019).

Multicollinearity

Variance Inflation Factor (VIF) coefficients, one method by which multicollinearity is tested, represent the correlation between the exogenous variables in a regression analysis. When the VIF coefficients are larger than 5.0, further evaluation of the multicollinearity may be required, but if it exceeds 10.0, it indicates that extreme multicollinearity is present and that it must be corrected (Hair et al., 2017). However, all the VIF coefficients in the current study fell within an acceptable range, indicating that multicollinearity does not present a problem.
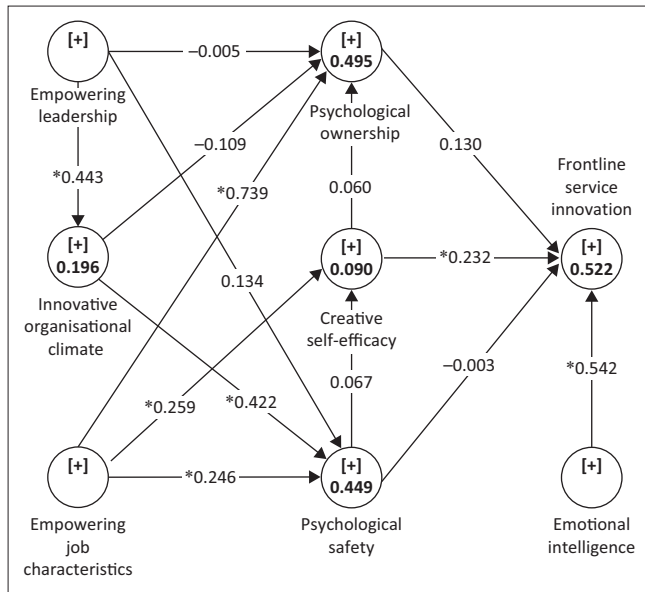
Source: Adapted from Nieder-Heitmann, M. (2019). *Antecedents of frontline service innovation within an agricultural retail, trade and services organisation within the Western Cape*. Master's thesis, University of Stellenbosch. Retrieved from https://scholar.sun.ac.za/handle/10019.1/107296

*, $p \leq 0.05$.

FIGURE 2: Structural model with path coefficients.

Evaluation of the path coefficients

Figure 2 is a depiction of the structural model that emerged from the statistical analyses that were conducted. The values within the circles of the latent variables represent the *R*-square values. *R*-square is the amount of variance explained in the endogenous variables by the remaining exogenous variables in the research model (Sekaran, 2000). Hair et al. (2017) consider *R*-square values of 0.2 and higher in behavioural studies as high, as it shows predictive accuracy. This may, however, vary according to the complexity of the model. The values on the connecting lines of the latent variables are the path coefficient values. The main effect hypotheses, which were shown to be statistically significant, as well as the strength or magnitude of the path coefficients, will be subsequently discussed.

The hypothesised relationships between *Empowering Leadership* and *Innovative Organisational Climate* (H₆), *Emotional Intelligence* and *Frontline Service Innovation* (H₁₂), *Empowering Job Characteristics* and *Creative Self-Efficacy* (H₁₃), *Creative Self-Efficacy* and *Frontline Service Innovation* (H₁₄), *Empowering Job Characteristics* and *Psychological Ownership* (H₁₆) and *Empowering Job Characteristics* and *Psychological Safety* (H₁₇) were established as being *significant*.

The positive relationship between *Empowering Leadership* and *Innovative Organisational Climate* (H₆) suggests that a leader who is perceived as empowering by his or her subordinates will promote an *Innovative Organisational Climate* within the organisation. This finding supports the earlier findings of Eustace and Martins (2014). The relationship between *Emotional Intelligence* and *Frontline Service Innovation* (H₁₂) was empirically supported by Boxer and Rekettye's (2011) findings. This outcome proposes that frontline employees with high *Emotional Intelligence* are likely to display *Frontline Service*

Innovation. The positive relationship between *Empowering Job Characteristics* and *Creative Self-Efficacy* (H₁₃) indicates that *Empowering Job Characteristics*, as perceived by the incumbent, have a positive effect on the individual's belief in his or her creative abilities. This resonates with the work of Slåtten (2014) and Coelho and Augusto (2010). The statistically significant relationship between *Creative Self-Efficacy* and *Frontline Service Innovation* (H₁₄) in the present study corroborated previous research findings (Hsu et al., 2011; Tierney & Farmer, 2002). The results of the study imply that incumbents with a high self-belief in their creative abilities will display innovative behaviour within the frontline service context. Moreover, the positive impact of *Empowering Job Characteristics* on *Psychological Ownership* (H₁₆) is consistent with the research findings of Lee and Song (2014). The positive relationship between *Empowering Job Characteristics* and *Psychological Safety* (H₁₇) is compatible with the findings of Frazier et al. (2017), which demonstrates how job characteristics and a supportive environment facilitate experienced *Psychological Safety.*

Further to this, the following mediation hypotheses were established as being significant: *Innovative Organisational Climate* mediates the relationship between *Empowering Leadership* and *Psychological Safety* (H₈), and *Creative Self-Efficacy* mediates the relationship between *Empowering Job Characteristics* and *Frontline Service Innovation* (H₁₅).

The statistically significant finding regarding the mediating relationship of *Innovative Organisational Climate* on *Empowering Leadership* and *Psychological Safety* (H₈) suggested that perceptions of empowerment by the leader will cultivate an *Innovative Organisational Climate,* which in turn will cultivate a perception of interpersonal safety among the frontline service employees. This finding resonates with the work of Eustace and Martins (2010), Mavrokordatos (2015) and Carmeli et al. (2010). The significant statistical findings on the mediating effect of *Creative Self-Efficacy* on the relationship between *Empowering Job Characteristics* and *Frontline Service Innovation* (H₁₅) corresponded with the researchers' expectations and the work of Slåtten (2014) and Coelho and Augusto (2010).

The path coefficients between *Emotional Intelligence* and *Frontline Service Innovation* (H₁₂) and *Empowering Job Characteristics* on *Psychological Ownership* (H₁₆) were considered rather 'large', whereas the path coefficients between *Empowering Leadership* and *Innovative Organisational Climate* and *Innovative Organisational Climate* and *Psychological Safety* (H₈) seem to be of 'medium' size. The path coefficients between *Empowering Job Characteristics* and *Creative Self-efficacy, Creative Self-efficacy* and *Frontline Service Innovation* (H₁₅) and *Empowering Job Characteristics and Psychological Safety* (H₁₇) were also of moderate strength. The rest of the path coefficients was not significant.

Evaluation and interpretation of the *R*-square values

The *R*-square values for this study, displayed in Figure 2 show that 52% (*R*² of 0.52) of the variance in Frontline Service Innovation is explained by the other remaining exogenous

variables in the model. This suggests that the overall research model accounts for 52% of the variance observed in Frontline Service Innovation.

The rest of the *R*-squared values indicated that the model accounts for 49% of the variance observed in Psychological Ownership, 20% of the variance in Innovative Organisational Climate, 45% of the variance in Psychological Safety and 9% of the variance in Creative Self-Efficacy. These values indicated that there were possibly other variables that were not measured in the current study, which may have influenced the endogenous variables in the research model.

Conclusion

Upon evaluation of the hypotheses and the path coefficients within the *Frontline Service Innovation* structural model, *Emotional Intelligence* and *Creative Self-Efficacy* emerged as the strongest predictors of *Frontline Service Innovation* within an agricultural retail, trade and services organisation within the Western Cape. Moreover, in promoting *Empowering Job Characteristics* and *Creative Self-Efficacy, Psychological Safety* and *Psychological Ownership* (albeit that the path coefficient between the latter two variables were not significant in the current study) are enhanced. Accordingly, on a practical level, the researchers recommend that *Frontline Service Innovation* should be promoted by demonstrative leadership behaviours, selection, training and development and organisational practices within the organisational context.

Leadership

Management, at all levels, should consistently and visibly demonstrate service innovation in order to promote and instil an innovative customer services culture within the relevant organisation. An *Empowering Leadership* style and *Innovative Organisational Culture* should contribute to an optimal level of *Psychological Safety* among frontline service employees in the agricultural retail, trade and services organisations.

Selection

A more stringent selection process for agricultural retail, trade and services organisations is proposed that involves competency modelling for the frontline service employees in the agricultural retail, trade and services organisations. Such competency frameworks should ideally include competencies such as *Emotional Intelligence, Creative Self-Efficacy* and *Frontline Service Innovation*.

Training and development

The most useful feature of the constructs *Emotional Intelligence, Creative Self-Efficacy* and *Frontline Service Innovation* is that they are all malleable constructs and, as such, may be susceptible to change interventions. The researchers propose that more well-known interventions such as formal training (classroom-based or e-learning) be

supplemented by informal development practices, such as coaching, to develop these constructs among the frontline service employees.

Organisational practices

The results obtained in the study further suggest that by adjusting the design of the frontline service employee's job to incorporate *Empowering Job Characteristics,* like *Job Autonomy, Task Variety, Task Identity, Task Significance* and *Feedback,* may increase *Creative Self-Efficacy* and the level of *Frontline Service Innovation* among frontline service employees in the agricultural retail, trade and services organisations.

Limitations and suggestions for future research

While the researchers believe that this research makes some significant contributions, they also acknowledge some limitations. These limitations include challenges of a methodological nature, the psychometric properties of some of the measuring instruments, the conceptualisation and operationalisation of *Frontline Service Innovation*, the operationalisation of *Psychological Safety* and possible oversights in the definition of the hypothesised paths between the variables in the model.

The methodological challenges include the small sample size, the number of participating organisations, method bias because of the use of self-report questionnaires, the language proficiency and cultural variations in the everyday language utilised by the participants. The current researchers are of the opinion that a larger sample size and more participating organisations could potentially have increased the generalisability of the results. It is further suggested that supervisory ratings be utilised to obtain independent measures of the frontline employees' innovation in service delivery in order to reduce method bias. Moreover, the revision of the Afrikaans explanations of the questionnaire items is recommended in order to improve the cultural accessibility of the items to the Afrikaans-speaking respondents within the Western Cape.

Some of the instruments utilised in the current study raised some concern, albeit to a varying degree. These instruments were those that measured *Obstacles* (a subscale of *Innovative Organisational Climate*), *Emotional Intelligence,* and *Psychological Safety*. The current researchers recommend revisiting these instruments or subscales in order to ensure psychometric soundness.

Psychological Ownership and *Psychological Safety's* non-significant relationship with *Frontline Service Innovation* causes one to question the conceptualisation and operationalisation of *Frontline Service Innovation*. The utilisation of qualitative interactional analysis might prove effective in delineating the construct and its sub-dimensions more precisely, which may lead to more effective operationalisation (Frey et al., 1999).

The possible causes for the non-significant direct relationship between *Empowering Leadership* and *Psychological Safety* may require further investigation. The researchers suspect that the *Psychological Safety* measure utilised in the current study operationalised *Psychological Safety* on a collective level, whereas *Empowering Leadership* is a dyadic (i.e. measures the relationship between frontline supervisor and the frontline employee) construct. A critical evaluation of the nature of the *Psychological Safety* measure within the *Frontline Service Innovation* structural model is recommended.

The sample size and the characteristics of the measurement model presented restrictions regarding the choice of statistical package. It is possible that there are paths in the structural model that are not defined that might reveal additional meaningful relationships between the latent variables. The current researchers, therefore, suggest that a larger sample be utilised, which could facilitate the utilisation of a statistical package, like Linear Structural Relations (LISREL), that includes modification indices. Finally, the researchers would recommend further research regarding the overall *Frontline Service Innovation* structural model and its delineating constructs and relevant paths.

Concluding comments

The current research project has shown that personal characteristics, such as *Emotional Intelligence* and *Creative Self-Efficacy*, are strong predictors of *Frontline Service Innovation*. It is also clear that these two personal characteristics are malleable and responsive to intentional development. The role played by organisational variables like *Empowering Leadership* in shaping *Innovative Organisational Culture* and *Empowering Job Characteristics* in creating the psychological states of *Psychological Safety* and *Psychological Ownership* and contributing to the development of *Creative Self-efficacy* is noteworthy. The role of *Innovative Organisational Culture* is also an organisational variable that has been shown to have a strong impact on *Psychological Safety*. The absence of significant pathways between *Psychological Safety* and *Psychological Ownership* and *Frontline Service Orientation* was contrary to the expectation and could possibly underline the importance of skills in the display of *Frontline Service Innovation*.

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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

The article is based on the unpublished master's thesis of the first author under the supervision of the D.J.M. The contribution to the final article is reflected by the sequence of the authors; M.N-H. and D.J.M.

Data availability

The data that support the findings of this study are available from the first author, M.N-H., upon reasonable request.

Disclaimer

The views and opinions expressed in this article are those of the authors and do not necessarily reflect the official policy or position of any affiliated agency of the authors.

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