Dramatic social change (COVID-19) moderating complexity leadership and organisational adaptability in Zimbabwean SMEs

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Abstract

Purpose

Major social changes, such as those induced by the COVID-19 pandemic, intensify the need for organisations in Africa to accelerate adaptation. Leadership plays an important role in their organisations' adaptation. This study focuses on how leaders can build adaptive organisations through appropriate complexity leadership practices by establishing which of these most predict organisational adaptation. The study aims to contribute to dramatic social change (DSC) theory and to empirically confirm conceptual relationships between complexity leadership theory and perceptions of organisational adaptability (OA).

Design/methodology/approach

The convenience non-probability sample include 126 senior management respondents from 24 small and medium enterprises in Zimbabwe. The study focuses on these individual senior managers' perceptions of their organisations' adaptation, leadership practices and the social changes during COVID-19. The questionnaire used a five-point Likert scale, based on some items from existing scales on entrepreneurial, operational and enabling leadership of complexity leadership and items on OA and DSC. The study applied structural equation modelling using SmartPLS and SPSS software.

Findings

The study formulates recommendations for the boundary conditions under which each or a combination of the complexity leadership practices will bring about the appropriate level of adaptability. The enabling and entrepreneurial leadership practices required, include brokering, decentralisation and establishing multilevel collaboration.

Originality/value

The study contributes insight for leaders to differentiate between the levels of adaptation their organisations require at particular times in particular contexts. Different adaptations will require a different combination of complexity leadership practices. When the adaptation sought is internal, operational leadership is more appropriate, whereas if the motive is market adaptation, entrepreneurial leadership is more appropriate.

Keywords: Change, Adaptability, Leadership, Complexity, Entrepreneurial leadership, COVID-19

Introduction

Organisational adaptation typically requires embracing change and capitalising on opportunities in the face of emerging challenges (MacDonald, 2021). Leaders have to implement practices and processes that drive the firm's ability to adapt (Bailey, Reeves, Whitaker, and Hutchinson, 2019; Kropp and McRae, 2022). Major social changes, such as those induced by the Covid-19 pandemic, however, intensify the need for the organisation to accelerate adaptation in order to seek alignment, or convergence, with the new context (Sarta, Durand, and Vergne, 2020; Uhl-Bien, 2021).

Escalating environmental dynamism, ambiguity, unpredictability and uncertainty result in rapid societal changes (Smith, Livingstone, and Thomas, 2019). De la Sablonnière (2017) refers to this phenomenon as the Dramatic Social Change Theory. Dramatic Social Change is associated with the rupture of social and normative structures, as well as a threat to cultural norms, in addition to the upheavals caused by the rapid pace of change. In fact, organisational adaptability could be adversely affected and firms could fail to cope with such contexts. These phenomena have certainly been experienced during the Covid-19 pandemic.

The researchers propose that Complexity Leadership Theory (Uhl-Bien and Arena, 2018; Uhl-Bien, 2021) offers a credible perspective on promoting and enabling adaptability in Dramatic Social Change contexts. By implementing Complexity Leadership practices, such as Enabling Leadership, Operational Leadership and Entrepreneurial Leadership, leaders can orchestrate their organisations' adaptation (Uhl-Bien and Arena, 2017; Uhl-Bien and Arena 2018). Therefore, this study focused on how leaders can build adaptive organisations through appropriate Complexity Leadership practices by establishing which of these most predict adaptability, and which combinations lead to appropriate levels of contextual convergence (Sarta *et al*., 2020). Leaders' perception of their organisations' adaptability is the focus of the current study as perceptions influence behaviour and inform leaders' actions in ways that orchestrate adaptation to particular contexts, such as those during the disruption of Dramatic Social Change environments.

Johns (2017) and Tourish (2019) propose that the integration of context (as in the case of dramatic Social Change) enriches leadership research. This study therefore integrates Dramatic Social Change as a moderating context in the relationship between Complexity Leadership Theory and adaptability. The existing academic literature suggests that too few adaptability studies have focused on small and medium enterprises (SMEs) (Battisti and Deakins, 2017; Dahles and Susilowati, 2015; Neef, Panyakotkaew, and Elstner, 2015). This study addressed this research gap by focusing on this population; specifically by conducting an investigation into Zimbabwe's SME sector. Moreover, Abebe, Tekleab and Lado (2020, p.151) encourage "studies that establish the utility and efficacy of leadership

theories and practices within the African context". This study therefore contributes to the knowledge about leadership in Africa, particularly in the SME sector.

The aim of the research is to explain whether, and to what extent, Complexity Leadership influences Organisational Adaptability in a Dramatic Social Change context, such as experienced in Africa during Covid-19. Additionally, by understanding the variable effects of Dramatic Social Change on firms, the study provides insights to leaders about the most appropriate Complexity Leadership practices to ensure Organisational Adaptability in their firms.

Literature review

Perception of Organisational Adaptability

Leaders have to perceive new opportunities in times of change in order to position their firms to be nimble enough to take advantage of emerging circumstances (Birkinshaw *et al*., 2016; Helfat and Martin, 2015; Teece, 2007). The literature also appears to emphasise that leaders have the hyper-agentic capability of orchestrating their firms, intentionally and relationally, to adapt by ensuring firm performance and change, while managing resistance. The current study focuses on the respondents' perceptions of their organisations' adaptability, since they need to perceive the need to adapt in order to act agentically to orchestrate their organisations' adaptability. The unit of analysis is therefore the individual managers' perceptions about their organisations' adaptation. Scholars are unequivocal about the need and importance of Organisational Adaptability and the subject is ubiquitous in management research. The field is full of conflicting tautological measures and conflation. Therefore, there are increasing calls for researchers to develop a more nuanced understanding of "the levels at which this phenomenon happens through empirical means" (Sarta, Durand, and Vergne, 2020, p.61).

While Barney's (2001) resource-based approach advances views about Organisational Adaptability based on availability of resources (Vergne and Depeyre, 2016), the behavioural stream approaches Organisational Adaptability from the viewpoint of the recognition of opportunities and appropriate exploitation (Salvato and Rerup, 2018). Both characterisations are implicit about the need for cognitive leadership capabilities. The current study is positioned within the behavioural stream approaches to Organisational Adaptability.

Organisational convergence can be viewed according to the three ecological levels posited by Sarta *et al*. (2020). First, internal adaptation involves the extent to which organizations align their resources, competencies, structures, and goals (Baumann, Eggers, and Stieglitz, 2019). The second level is market adaptation, which concerns the extent to which an organization's main audience's demands are addressed by the organization's value proposition. Third, institutional transformation entails the alignment between organizations and the social norms in their institutional environments, which may manifest as conformity (Jourdan, Durand, and Thornton, 2017).

Sarta *et al*. (2020) conceptualise adaptation as intentional, relational, conditional and convergent, noting that organisations try to reduce the distance between themselves and their economic, social and institutional environments. This typology is adopted in the current study.

Complexity Leadership Theory (CLT)

Rooted in Complex Adaptive Systems (CAS) Theory (Uhl-Bien *et al*., 2007; Uhl-Bien, 2021; Uhl-Bien, Meyer, and Smith, 2020), Complexity Leadership Theory remains mostly unexplored. Consequently there have been calls for leadership researchers to advance our understanding of Complexity Leadership Theory by focusing on the intricacies of how Organisational Adaptability, as an outcome, is achieved through the Complexity Leadership Theory lens (Linnenluecke, 2017; Rosenhead *et al*., 2019; Tourish, 2019; Uhl-Bien and Arena, 2018).Uhl-Bien (2021) observed recently that COVID-19 opened up opportunities and new ways of thinking and leaders must therefore better understand how leadership enables organisations for adaptability.

Few studies have offered sufficient empirical evidence to support the theoretical underpinnings and justifications of Complexity Leadership Theory (Rosenhead *et al*. 2019; Tourish, 2019; Tsoukas 2017). The current study offers its contribution to this shortcoming by presenting credible empirical findings within its own limitations. Recent theoretical refinements advance three subconstructs as core tenets of Complexity Leadership Theory, namely, Entrepreneurial Leadership (ENTLEAD), Operational Leadership (OPLEAD) and Enabling Leadership (ENALEAD) (Uhl-Bien and Arena, 2017, 2018).

Whereas Entrepreneurial Leadership influences local behaviours through informal interactions that lead to innovative outcomes (Reid *et al*., 2018), Operational Leadership allows management to achieve control and efficiency through formal structures and systems (Uhl-Bien and Arena, 2017). These leadership styles are apparently paradoxical. Enabling Leadership dynamically interfaces these leadership priorities, fostering the conditions needed to loosen administrative structures while simultaneously allowing the organisation to experiment and thrive, confirming that leaders need to manage paradoxes, or conflicting demands, as highlighted in the work of Rosenhead *et al*. (2019) and Tourish (2019).

Operational Leadership involves leadership in and through formal systems, structures and processes that require continued refinement within the dominant organisational logic. Operational leaders accommodate and integrate new ideas into business operations through sponsorship, execution and alignment (Uhl-Bien and Arena, 2017). It is therefore hypothesised that Operational Leadership is positively related to perceptions of Organisational Adaptability.

> *H1: There is a positive relationship between Operational Leadership (OPLEAD) and Perception of Organisational Adaptability (OA).*

Uhl-Bien and Arena (2018) state that Entrepreneurial Leadership promotes endogenous entrepreneurship and innovation, which is similar to Lingo's (2020) view of entrepreneurial leadership as creative brokering. Complexity Leadership Theory conceptualises informal networks in organisations as the basis for absorbing and exchanging large amounts of information, thereby promoting higher innovation and ingenuity (Marion *et al*., 2016; Perry-Smith and Mannucci, 2017; Uhl-Bien and Arena, 2018). This capability improves the firm's ability to discern, absorb and seek convergence with emerging and unpredictable contextual demands.

When faced with challenging circumstances, leaders are expected to adjust their leadership practices to embrace change and manage it dynamically (Teece, Pisano, and Shuen, 1997). Uhl-Bien and Arena (2018) assert that these practices are consistent with the co-creation and co-action processes associated with Entrepreneurial Leadership, a view also supported by Lingo (2020). Therefore, we propose that Entrepreneurial Leadership promotes activities that encourage endogenous entrepreneurship and innovation; thus, Entrepreneurial Leadership is positively related to perceptions of Organisational Adaptability.

> *H2: There is a positive relationship between Entrepreneurial Leadership (ENTLEAD) and Perception of Organisational Adaptability (OA).*

Enabling Leadership overcomes the problems of core rigidities by utilising the CAS, which enables an adaptive space, an interface that bridges the competing ambidextrous needs of exploitation and exploration (Papachroni *et al*., 2015; Uhl-Bien and Arena, 2017). Complexity Leadership Theory proclaims that brokerage and collaboration are critical for Organisational Adaptability. When conflicting demands are sanctioned and facilitation provided, collaboration ensues within and outside the organisation, leading to Organisational Adaptability. Uhl-Bien and Arena (2017, 2018) posit that this type of facilitation is consistent with Enabling Leadership. Leaders are encouraged to establish networks and act as brokers between agents in the CAS. It is therefore posited that, using Enabling Leadership (Uhl-Bien and Arena, 2018) behaviours as well as practices, and moving from cooperation to collaboration, leads to perceptions of Organisational Adaptability.

> *H3: There is a positive relationship between Enabling Leadership (ENALEAD) and Perception of Organisational Adaptability (OA).*

Moderation by Dramatic Social Change Theory

Today's organisation and its leaders face uncertainty-saturated, dynamic environments characterised by profound contradiction and interrelatedness - a logically but apparently irrationally localised milieu (de la Sablonnière, 2017; Lewis, 2000, Lewis and Smith, 2014; Papachroni *et al*., 2015). Emerging "rapid societal changes" are complex yet multifaceted qualitative transformations that arise within a society, altering an existing societal state (Smith *et al*., 2019, p.33). Such changes, caused by complex and

dynamic contexts, have emerged because of the dramatic ecological and societal ramifications of Covid-19 which have transformed the way businesses operate, working methods, places of work and regulatory environments (cf. Bailey and Breslin, 2021). Smith *et al.* (2019) argue that such abrupt and nonlinear (as opposed to incremental, linear and controlled) changes lead to dramatic changes in the fabric of firms, industries, clusters, sectors, nations and the global economy - a societal contextual phenomenon.

De la Sablonnière's (2017) theory on Dramatic Social Change is associated with the disequilibrating of social, normative and cultural structures. This rupture is ascribed to the inability of societal structures to adapt immediately. Nonetheless, according to Linnenluecke (2017), firms have to remain resilient and persevere in such Dramatic Social Change contexts in order to adapt and thrive. De la Sablonnière (2017) notes four characteristics of Dramatic Social Change. The first is rapid pace of change, in which Dramatic Social Change happens quickly, encouraging firms to break swiftly with the past in order to survive. The second is the rupture of social structures, in which a collective society has to negotiate its way through social emergent structures. Thirdly, the rupture of normative structures, during which micro-processes that define norms and habits are collectively shifted to achieve common emergent goals and adaptability. Lastly, de la Sablonnière (2017) conceives that a threat to cultural identity results when changes cause identity confusion and crises that challenge and jeopardise an existing cultural identity. Therefore, we can reason that a Dramatic Social Change context poses noticeable leadership effectiveness challenges, because of its complex nature and indeterminate, multifaced characteristics.

Contextual leadership scholars have urged researchers "to treat context and its factors as moderators in studies on antecedents such as leadership behaviours, processes and leadership outcomes" (Hiller *et al.*, 2019, p.7-8). The literature calls for studies to further our extant knowledge on how the "inescapable context impacts leadership" (Oc, 2018, p.230), as this is mainly ignored by leadership studies (Tsoukas, 2017). To this end, the researchers propose that incorporating context can elucidate how Complexity Leadership influences perceptions of Organisational Adaptability in Dramatic Social Change contexts. Different firms, by their nature (e.g., size, age, location, industry, spatial attributes), could adapt differently (see Johns, 2017; Zaccaro et al., 2018) to contexts such as Dramatic Social Change. Consequently, we argue that Dramatic Social Change sets boundary conditions and moderates the relationship between Complexity Leadership and perceptions of Organisational Adaptability.

Different Entrepreneurial Leadership, Operational Leadership and Enabling Leadership levels could thus emerge as leaders monitor the environment, track performance, seek alternative growth options and develop new products and services. Therefore, we propose that an increase in Dramatic Social Change would intensify Complexity Leadership practices, positively enhancing Organisational Adaptability. It is thus posited that increases in Dramatic Social Change levels positively enhance the relationship between Complexity Leadership and perceptions of Organisational Adaptability, leading to the following propositions:

H4.1: A Dramatic Social Change (DSC) context has a positive enhancing moderating effect on the relationship between Operational Leadership and perceptions of Organisational Adaptability.

H4.2: A Dramatic Social Change (DSC) context has a positive enhancing moderating effect on the relationship between Entrepreneurial Leadership and perceptions of Organisational Adaptability.

H4.3: A Dramatic Social Change (DSC) context has a positive enhancing moderating effect on the relationship between Enabling Leadership and perceptions of Organisational Adaptability.

A conceptual framework is provided (Figure 1) that identifies the constructs and hypotheses.
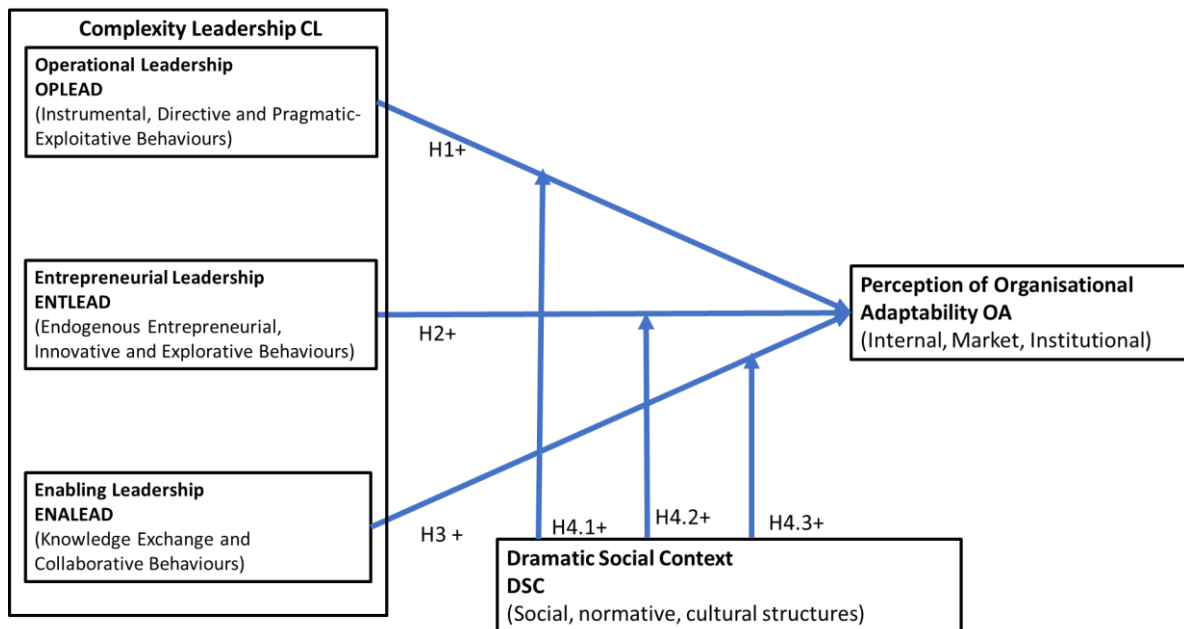

Figure 1: Conceptual framework (Authors' own compilation)

Compared to established corporates, SMEs are characterised by relatively limited access to the institutional, financial, credit and human resources required to deal with the vulnerabilities of Dramatic Social Change contexts induced by phenomena such as Covid-19 (cf. Smallbone et al., 2012). This sector also faces challenges such as deeper supply chain dependencies, lags in technology adoption and limited access to global markets and knowledge networks (Fouejieu, Ndoye, and Sydorenko, 2020). This implies the need for definitive Complexity Leadership capabilities that could catalyse this sector to adapt and thrive in complex dramatic contexts.

SMEs therefore constitute an important sector to conduct the study. In addition, Zimbabwe is an interesting context to study the SME sector, since it is characterised by high inflation rates from 10.6 percent in 2018, to hyper-inflation in 2020, showing a dramatic increase to 557.21 percent (O'Neill,

2021). This economic environment poses high risk, limited savings and low security in times of crises, such as with the level-four lockdown restrictions of Covid-19 (Samaita, 2021), creating further vulnerability and insecurity for SMEs in Zimbabwe.

Although there are multiple, and arguably many arbitrary, classifications and definitions of SMEs across the world, the Organisation for Economic Co-operation and Development (OECD) (2017) estimates that these firms constitute 90% of the global firm population. SMEs employ 50-60% of the workforce in high-income countries and thus play key sectoral roles in employment, fostering innovation, production and trade of goods, services provision, and the generation of tax revenues (Battisti and Deakins, 2017). A similar percentage is also observed in transition economies. SMEs play a key role in local economies, fostering job opportunities in multiple supply chains (OECD, 2020) and thus offer a sound population.

Method

Research philosophy and method

The study applied a critical realism (CR) philosophy. While the world is viewed as closed and deductive in positivism, and open, inductive and socially discursive in post-modernism, CR focuses on the necessary, contextual and contingent structures, and their power, that create the social world (Sayer, 1992; Sousa, 2010).

The literature review demonstrated that Complexity Leadership Theory emphasises complexity, interrelatedness, emergence, open systems and the contextual dependence of leadership. Its propositions are therefore congruent with CR, which is why this research adopted the CR philosophy. This ontology calls for abductive reasoning through revision and interpretation, transitive dimensioning and establishment of the causal efficacy of independent reality (Sayer, 2004). These views resonate with those of Tsoukas (2017), who argues that Complexity Leadership researchers need to apply the abductive reasoning of Complexity Leadership Theory. This study adopted CR explanatory and predictive epistemology. The etiological assumptions were that perceptions of Organisational Adaptability results from multiple interactions (directly and indirectly) of the Complexity Leadership Theory subconstructs, while Dramatic Social Change acts as the contextual boundary. Therefore, the study considered the explanatory and predictive nature of the relationship between Complexity Leadership and Dramatic Social Change.

According to the classification preferred by Battisti and Deakins (2017), constructs of interest can be viewed as either externally oriented (exogenous or reflective) or internally oriented (endogenous or formative). The literature review concluded that the Complexity Leadership construct is composed of Entrepreneurial Leadership, Enabling Leadership and Operational Leadership; therefore, the researchers reasoned that Complexity Leadership is an endogenous construct. Similarly, this study

classified Dramatic Social Change as a composite construct. The research adopted the survey method. Self-administered electronic surveys were deployed to collect quantitative data over a period of six weeks using the Qualtrics Online Survey Platform.

Measurement instrument

The questionnaire items were uniformly structured to use the 5-point Likert-type scale (Cohen, Cohen, West and Aiken, 2003). Section one of the questionnaire requested data about Operational Leadership practices in the firm, such as the contextual adaptation of tools and techniques; exploitative and cooperative behaviours implementing formal processes. Examples of items include, "Our leaders develop specific policies to support our firm vision and purpose"; "In this organization, leaders translate the company's mission into specific goals".

This section had a total of 19 questions, of which 14 were adopted from the Antonakis and House (2014) scale which returned reliability of between $\alpha = 0.77$ and 0.86. As there were no standard scales available to measure Complexity Leadership the researchers developed similarly-defined leadership practices and inferred five questions based on the theoretical propositions of Uhl-Bien and Arena (2017, 2018).

The next section of the questionnaire explored Entrepreneurial Leadership practices in the firm, which promote innovation and explorative behaviours such as co-creation, co-action, acquiring new knowledge, developing new skills, implementing new processes, and developing new products and markets. This section had a total of 23 questions, 20 of which were adopted from the entrepreneurial audit instrument developed by Ireland, Kuratko, and Morris (2006a, 2006b). Three questions were adopted from Khalili's (2017) scale which measured creative and innovative leadership. Examples of items include: "Our executives actively search for new ideas and big opportunities"; "Our management motivates the employees to use new information sources within our industry".

Enabling Leadership practices promote new knowledge and collaborative exchanges including enabling collaboration, providing brokerage, instigating tension and paradox, and applying contextual intelligence. There were a total of 21 questions in this section. The researchers adopted 12 questions, on patterning attention and developing networks, from the scales developed by Osborn and Marion (2009), who defined the leadership roles associated with contextual leadership. Of the remaining questions, five were adopted from Kutz's (2008) meta-competencies in contextual leadership, while four were developed by the researchers based on the theoretical propositions of Uhl-Bien and Arena (2017, 2018). Examples of items include, "Our leaders facilitate dialogue and discussion to help employees share knowledge in developing a shared understanding of issues"; "Our leaders create linkages between entities inside the organisation and with external stakeholders".

The fourth section paid attention to the perception of the respondents about the adaptability of their organisations. This section asked respondents to reflect on absorptive capacity, innovation indicators

and collaboration indicators to obtain the levels of perceived Organisational Adaptability in their firms. The study thus did not use objective measures of organisational level outcomes, instead, the subjective perceptions of individuals were the focus. This section composed of 14 items. Five items on innovation indicators = from the scale developed by Jansen, Vera and Crossan (2009), ($\alpha = 0.86$); Five questions from Flatten, Engelen, Zahra, and Brettel's (2011) instrument, whose validated multidimensional absorptive capacity instrument returned $\alpha = 0.79$-0.91; Four items were appropriated from the measurement scale ($\alpha = 0.85$-0.95) developed by Roberts, Van Wyk and Dhanpat (2017), who stressed the importance of collaboration in a hyperconnected and complex business context. Examples of items include, "Market scanning, collaboration with customers and marketing channels"; "Structural arrangements and empowerment of operational processes".

Lastly, respondents were asked about the impact of the moderating context, Covid-19-induced Dramatic Social Change, on them, their firms, the market and the institutions relevant to their day-to-day operations. Nine items were used. Despite the scarcity of empirical studies on the developing Dramatic Social Change theory, the researchers were able to source four validated items from Dramatic Social Change author, de la Sablonnière (2017). The balance of five questions was developed from the literature. Items for Dramatic Social Change include, "In our company, the level of impact on strategic planning and speed of execution has become dramatic"; "There has been a dramatic impact on the way and methods our teams use to communicate, operate and introduce new ideas in our company".

Analytical Method

The study applied structural equation modelling (SEM) using SmartPLS and SPSS software to analyse the data as these tools afford both descriptive and inferential approaches. Strasheim (2014) notes that the SEM approach is the best for multivariate statistical analysis. Partial least squares (PLS-SEM) was adopted as it develops and maximises unexplained total variance, thus offering more significant prediction (Hair, Matthews, Matthews, and Sarstedt, 2017). This analytical technique also enables the specification of explanatory and theory-based models when developing, evaluating and confirming theory (Hair *et al*., 2017).

Sample and unit of analysis

The study used a convenience non-probability sampling method, where one of the researchers who lives in Zimbabwe and who is running an SME sent the survey link to his business contacts. The study therefore obtained quantitative data from business owners, executives, senior professionals and managers within the Zimbabwean SME sector. The individual business owners, executives and managers' perceptions were considered the unit of observation for the Complexity Leadership, Dramatic Social Change and Organisational Adaptability measures. The final sample was N=495, representing 18.75% of the target population which is considered sufficient according to Hair *et al*.

(2017) who posit that a sample size n=50 may be considered sufficient for study when using PLS-SEM. Though data imputation recommendations by Kock (2018) could have been conducted, the researchers considered that there was no need to impute the data from the survey responses since the threshold of a minimum sample size of 50 in PLS-SEM (see Ringle *et al*, 2012; Hair *et al*. 2017, p.118) had already been achieved.

Results

Sample characteristics

The 126 respondents' ages ranged from 27 to 62 years, with a mean age of 41 years. Most respondents (32) were from the finance, insurance and real estate sector, followed by the information and communication technology sector with 29, cumulatively representing 48.42% of the total sample. A total of 24 different organisations participated in the study. Manufacturing, industry and commerce contributed the third highest number of respondents, (n=11, 8.73%). 86.5% of the firms represented had headquarters in Zimbabwe, 4% in Europe and the rest in other jurisdictions. The data shows that most respondents (n=25) worked in ICT, followed by finance, treasury and accounting (n=21) and then business development and strategy (n=17), cumulatively representing 50% of the sample. 80.2% of respondents were senior managers, 65 were senior managers or executives, and 36 were middle managers. The next section pays attention to reliability and validity.

Reliability and validity indicators

Convergent validity characterises the extent to which a construct converges to explain the variance of its factors and is indicated through the average variance extracted (AVE), which should be greater than 0.5 (Hair *et al*., 2019, p.9). Cronbach's alpha, Joreskog's composite reliability or Dijkstra-Henseler's rho values are only suitable for reflective measures as they measure extent of common variance (Hair *et al*., 2019). Formative measures utilise total variance explained (Hair *et al*., 2019), therefore only AVE is relevant in the PLS-SEM analysis. Table 1 illustrates the values for reliability (reflective measures on Organisational Adaptability) and AVE (reflective and formative measures).

Table 1 Construct reliability and average variance extracted results

Insert table 1 here

All the constructs have an AVE of > 0.5, therefore the measurement models for Organisational Adaptability, Operational Leadership, Entrepreneurial Leadership, Enabling Leadership and Dramatic Social Change have convergent validity, and warrant further analysis.

Discriminant validity

The study applied Henseler *et al*.'s (2015) heterotrait-monotrait (HTMT) ratio of correlations with bootstrapping at 5000 resamples, set at the upper limit of under 0.85-0.9 (Kock, 2015). The test is suitable for both reflective and formative measurement specification (Henseler *et al*., 2015). The attained values for all constructs: Organisational Adaptability, Operational Leadership, Entrepreneurial Leadership, Enabling Leadership, Dramatic Social Change, are displayed in Table 2.

Table 2 Organisational adaptability discriminant validity results

Insert table 2 here

The attained HTMT results confirm discriminant validity for Organisational Adaptability against Enabling Leadership, Entrepreneurial Leadership, Dramatic Social Change and Operational Leadership (HTMT=0.602, 0.672, 0.516, 0.603 < 0.85 respectively). This confirmed that the entire outer measurement model had no problematic discriminant validity issues and thus warrants further inquiry.

Indicator multicollinearity for formative measures

Variance inflation factor (VIF), a measure of the correlation of one independent variable with a group of other variables, is often used to measure multicollinearity of formative indicators (Hair *et al*., 2019). Kock's (2015) as well as Kock and Lynn's (2012) full collinearity tests were applied to eliminate spurious correlations among indicators as a result of common method bias, with threshold set at $0.2 < VIF < 5$ (Hair *et al*., 2019). Table 3 displays the multicollinearity values attained for the indicators per construct in the measurement model.

Table 3 Variance inflation factor (VIF) values for all reflective measurements

Insert table 3 here

All VIF values were $0.2 < VIF < 5$. There were no problematic multicollinearity issues and thus further analysis was necessary.

Indicator Weights and Statistical Significance

Indicators were examined for weight, significance and relevance within the standardised values between -1 and +1, per Hair *et al*.'s (2019, p.10-11) recommendations. The results are illustrated in Table 4.

Table 4 Formative measures of relevance and significance of attained values

Insert table 4 here

The data illustrates that in the formative construct measurement model, three items under Entrepreneurial Leadership (EntrLead_6: t=1.406, p=0.15, EntrLead_10: t=1.540, p=0.133, EntreLead_11: t=1.585, p=0.113) and two items under the moderator Dramatic Social Change (ModDramatic Social Change_4:

t=1.679, p=0.093 and ModDramatic Social Change_6: t=0.613, p=0.54) did not meet the criteria for relevance and significance, and were thus expunged in the subsequent procedures.

The next sections focus on assessing the structural model in terms of the inner model and then assessing the statistical significance and relevance of path coefficients.

Assessing the structural model (inner model)

This assessment constituted the second stage of the analysis. The standard assessment criteria for PLS-SEM involve assessing construct multicollinearity, coefficient of determination R^2 (the model's explanatory power) and the redundancy measure Q^2 (the model's predictive power through blindfolding-based cross-validation). Table 5 displays the VIF results of the structural (inner) model. The current study used PLS-SEM instead of CV-SEM. PLS-SEM considers total variance and as a result the goodness of fit index is not relevant for the following reasons: Hair et al. (2017) advised that researchers should be cautious to report and use model fit in PLS-SEM. The proposed criteria are in their early stage of research, are not fully understood (e.g., the critical threshold values), and are often not useful for PLS-SEM. These criteria are usually not used for the PLS-SEM results assessment. Lohmöller (1989) states that some fit measures imply restrictive assumptions on the residual covariances, which PLS-SEM does not imply when estimating the model.

Table 5 Construct VIF output

Insert table 5 here

The results all fell within the recommended range, suggesting that construct multicollinearity was not a problem in the model and therefore necessitated further assessment. Figure 2 is a visual representation of the PLS-SEM output.
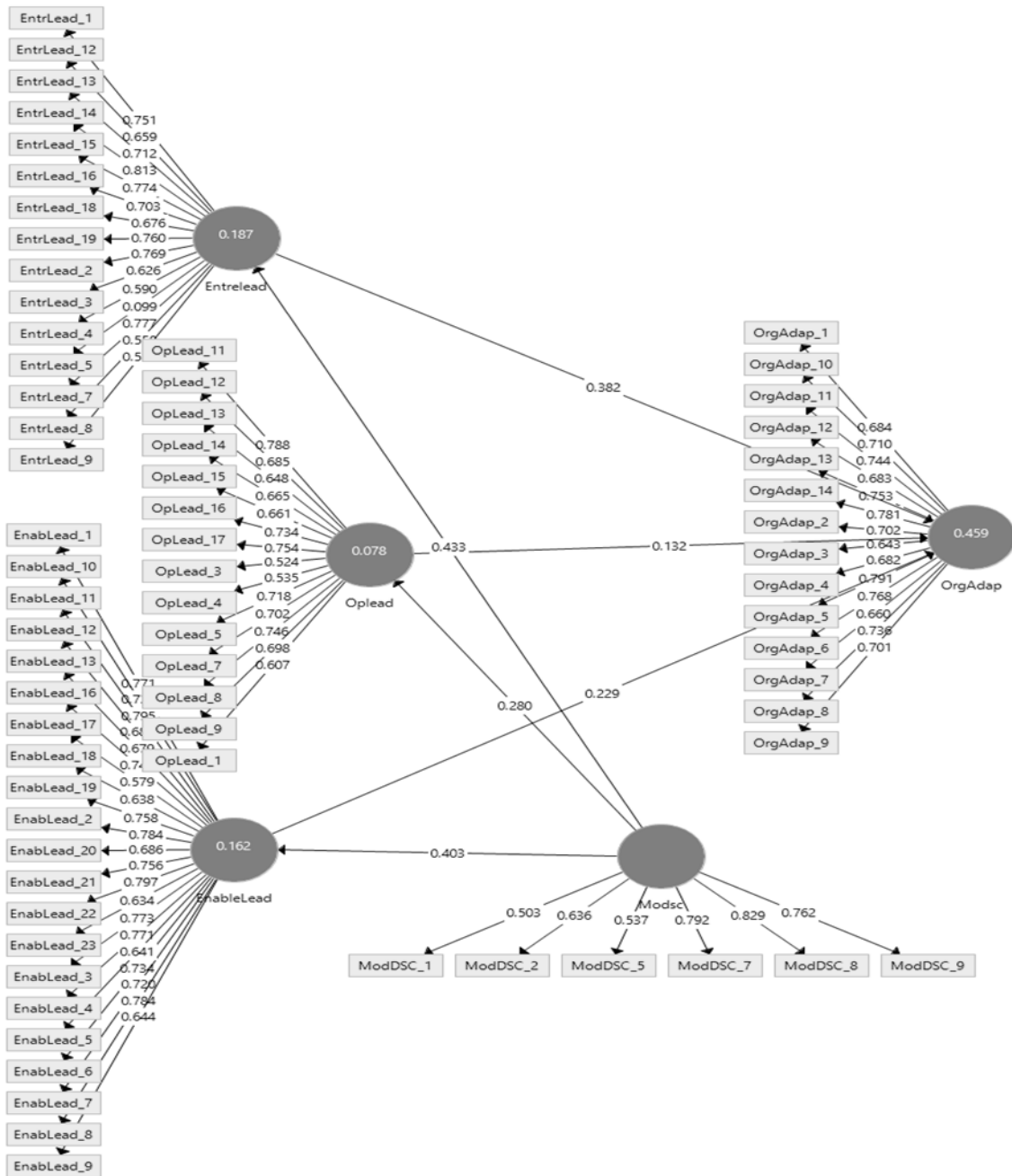
Figure 2 PLS-SEM output

Assessing R² - total variance

R^2 measures in-sample predictive power (Rigdon, 2012; Hair *et al*., 2019, p.11); it measures the total (not common) variance, and thus the model's explanatory power (Shmueli and Koppius, 2011). Thresholds are such that 0.75 = satisfactory, 0.5 = moderate and 0.25 = weak (Hair *et al*., 2011). Table 6 shows the R^2 values.

Table 6 R² values for endogenous variables

Insert table 6 here

The adjusted R^2 values are all positive, with Entrepreneurial Leadership showing the highest explanatory power at $R^2 = 0.181$, followed by Enabling Leadership ($R^2 = 0.155$) and Operational Leadership ($R^2 = 0.071$). Even though all the values of $R^2 < 0.25$, suggesting weak explanatory power, the model returned acceptable levels of in-sample explanatory power. However, according to Dolce *et al*. (2017) and Shmueli and Koppius (2011), this condition does not speak to the structural model's out-of-sample predictive power. As the model suggested explanatory power, it justified further analysis to ascertain its predictive power.

Assessing Q^2 - predictive accuracy

The Q^2 – Predictive accuracy metric assesses the structural model's predictive accuracy. The researchers applied the blindfolding procedure (Rigdon, 2014; Sarstedt, Ringle, Smith, Reams, and Hair, 2014b) to establish aspects of out-of-sample prediction and in-sample explanatory power (Shmueli *et al*., 2016; Sarstedt *et al*., 2017a). Q^2 thresholds were set at $Q^2 > 0$, small, $Q^2 > 0.25$, medium and $Q^2 > 0.5$, large. Table 7 denotes Q^2 predictive power for all endogenous constructs.

Table 7 Q^2 values for endogenous variables

Insert table 7 here

All Q^2 values are positive, with Enabling Leadership showing the highest, though weak, predictive power ($Q^2 = 0.079 < 0.25$). Entrepreneurial Leadership also returned predictive power ($Q^2 = 0.076 < 0.25$), confirming the model's predictive relevance and further substantiating the need for a significance test.

Assessing statistical significance and relevance of path coefficients

The penultimate procedure in the PLS-SEM involved assessing the significance and relevance of the path coefficients (β values) to establish the model's out-of-sample predictive power. This was achieved by running accelerated bootstrapping (BCa) (Nitzl, Roldán, and Cepeda, 2016). Further, the importance-performance map analysis (IPMA) established the total (direct and indirect) effects of the target constructs through the moderating construct per Ringle and Sarstedt's (2016) recommendations. The beta path coefficients for the direct and indirect relationships are shown in Table 8.

Table 8 Hypothesis verification using path coefficients, significance and relevance

Insert table 8 here

The structural path, OpLead -> OrgAdap (β = 0.132), shows that Operational Leadership is positively linked to Organisational Adaptability; however, the link has no relevance (t = 1.698 < 1.96) and no significance (p = 0.09 > 0.05), and hypothesis H1 is therefore not supported. Meanwhile, Entrepreneurial Leadership shows a positive, relevant, and significant link to Organisational Adaptability (β = 0.382, p=0.000 < 0.05, t=3.949 > 1.96), which lends support to hypothesis H2. Similarly, Enabling Leadership and Organisational Adaptability are positively linked (β = 0.229, p=0.044 < 0.05, t=1.995 > 1.96), lending support to hypothesis H3. Further, Table 8 shows that Entrepreneurial Leadership explained 38.2% (β = 0.382) of Organisational Adaptability variance, while Enabling Leadership accounted for 22.9% (β = 0.229) of the variance in Organisational Adaptability. While Operational Leadership returned an explanatory and predictive level of 13.2% (β = 0.132), this explanatory power could not be attributable to Operational Leadership alone due to the absence of significance and relevance. In the next section the moderation effect of Dramatic Social Change is discussed.

Confirming moderation of Dramatic Social Change

The final procedures evaluated the impact of Dramatic Social Change as moderator. Following the recommendations of Nitzl *et al.* (2016) as well as Ringle and Sarstedt (2016), indirect effects were computed using the BCa procedures. The moderation effects were hypothesised through Hypothesis H4 (H4.1, H4.2 and H4.3). The figures below illustrate the hypothesis verification using path coefficients, significance, and relevance of indirect relationships. The moderation effects are highlighted using simple slopes illustrations in Figure 3 (H4.1), Figure 4 (H4.2) and Figure 5 (H4.3).

The results show that the indirect effects were significant and thus affirm the positive moderation of Dramatic Social Change in the relationship between Complexity Leadership and Organisational Adaptability. More critically and noteworthy, while the link between Operational Leadership and Organisational Adaptability was not significant directly, under moderation the relationship is significant and relevant (β = 0.280, P=0.01 <0.05, t=3.316), hence hypothesis H4.1 is accepted. Figure 3 depicts the simple slopes test outcome from SmartPLS 3.0, which confirms that indeed the relationship varies at different levels of Dramatic Social Change.
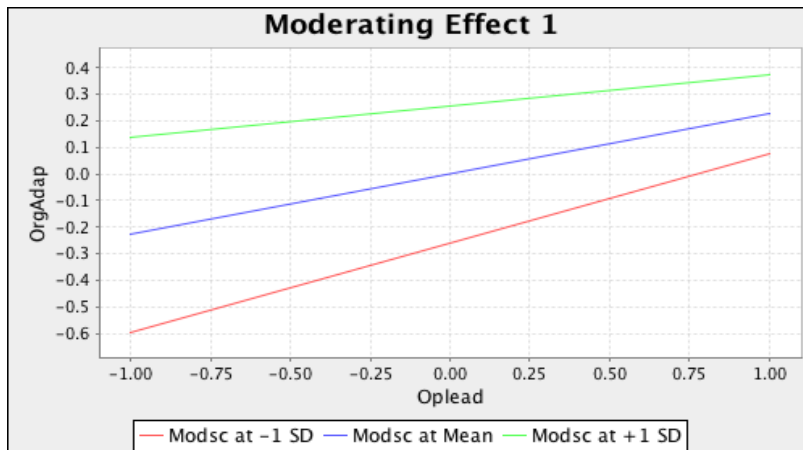
Figure 3 Simple slopes output of Dramatic Social Change moderation on Operational Leadership

Dramatic Social Change positively moderates the link between Entrepreneurial Leadership and Organisational Adaptability (β = 0.433, p=0.000, t=7.528). As such, the indirect effects affirm hypothesis H4.2. Figure 4 depicts the differential effects of Dramatic Social Change on the link between Entrepreneurial Leadership and Organisational Adaptability, confirming positive moderating effects.
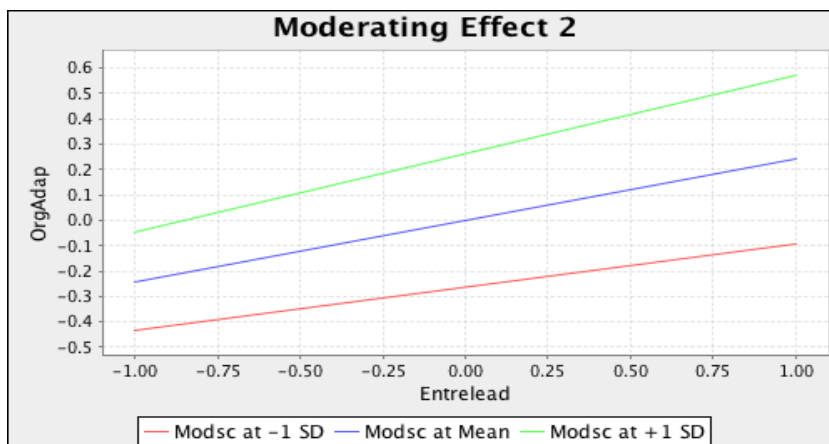
Figure 4 Simple slopes output of Dramatic Social Change moderation on Entrepreneurial Leadership

Additionally, the relationship between Enabling Leadership and Organisational Adaptability returned (β = 0.403, p=0.000, t=5.575), confirming Dramatic Social Change's positive moderation, and therefore H4.3 is accepted. Figure 5 attests to these positive moderation effects by showing the positive slopes on the graphs while Organisational Adaptability's outcome is seen to vary with a shift in Dramatic Social Change level.
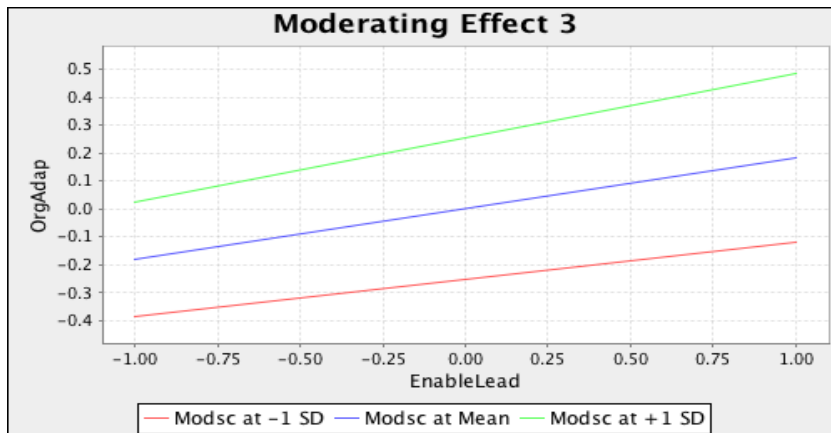
Figure 5 Simple slopes output of Dramatic Social Change moderation on Enabling Leadership

The explained variance by Operational Leadership, Entrepreneurial Leadership and Enabling Leadership on Organisational Adaptability under Dramatic Social Change moderation is 28.0%, 43.3%, and 40.3% respectively.

The objective of this study was to explain the relationship between Complexity Leadership and Organisational Adaptability, guided by Critical Realism philosophical assumptions and retroduction epistemology. Consequently, both explanatory and predictive power were necessary for the model. The predictive relevance of the model was therefore assessed by applying the confirmatory tetrad analysis (CTA) (Sarstedt *et al*., 2019) and Ramsey's (1969) linear regression (LM).

The PLS-SEM results from the model have lower prediction errors than the LM output. Therefore, following recommendations by (e.g., Gardner *et al*., 2017; Sarstedt *et al*., 2019), the model's results were confirmed to be robust. With the model robustness confirmed, and the veracity of the results assured, the next section addresses the research questions and the assessment of the effect sizes in particular.

Assessing effect sizes of constructs

As outcome affirmation, the f^2 test, which ascertains the size of each predictor variable's effect on the criterion variable (Hair *et al*., 2019), was computed. Table 9 shows these results. The f^2 is important to identify the rank order of an endogenous construct in the structural model, and establish how much it explains a criterion construct (Hair *et al*. 2019; Nitzl *et al*. (2016). Nitzl *et al*. (2016) note that values less than 0.02 are small, less than 0.15 are medium and less than 0.35 depict large effect sizes.

Table 9 Effect sizes (f^2)

Insert table 9 here

Table 9 shows that the highest rank-order on the direct effects is Entrepreneurial Leadership (f^2 =0.118 >0.15), a medium effect that further increases under moderation (f^2 =0.23 <0.35), explaining its effect on Organisational Adaptability. Furthermore, Enabling Leadership has the second largest, though small, effect

size ($f^2 = 0.035 < 0.15$) when directly related to Organisational Adaptability, while its effect size under Dramatic Social Change moderation rises significantly to medium ($f^2 = 0.194 > 0.15$), an effect similar to that of Entrepreneurial Leadership. Lastly, Operational Leadership returns small effect sizes in explaining Organisational Adaptability ($f^2 = 0.012 < 0.15$) directly, although this rise significantly (yet remains small) under moderation ($f^2 = 0.085 < 0.25$).

Discussion

The findings show that an increase in Operational Leadership levels fails to significantly explain variance in the perception of Organisational Adaptation. A possible explanation could be that the Zimbabwean SMEs in the sample may not usually engage in the entrenched Operational Leadership practices arising from selective attention and contextual cue prioritisation (cf, Ahmadi *et al*., 2017). Describing Operational Leadership practices, Uhl-Bien and Arena (2018) express the need for studies on how Complexity Leadership could lead to Organisational Adaptability as an outcome. Uhl-Bien and Arena (2018) and Uhl-Bien *et al*. (2020) posit that Operational Leadership is inherently grounded in necessary bureaucratic hierarchies, with hierarchical leaders vested with power and authority.

Uhl-Bien and Arena (2018) suggest that Operational Leadership should reward entrepreneurial thinking in the firm and shift from stifling tendencies to those that accommodate entrepreneurial attempts. Leaders may also sponsor and implement innovative initiatives around emergent ideas (exploitation). The old Operational Leadership models are viewed as suppressing the necessary explorative activities at the business's operating core that may lead to Organisational Adaptability. As the data for this study was collected during the multiple lockdowns in response to the Covid-19 pandemic, respondents may have ascribed their firms' performance to Operational Leadership practices, indifferently to their cognition of the Organisational Adaptability expectations at the time.

The second research sub-question contemplated the nature of the relationship between Entrepreneurial Leadership and Organisational Adaptability and posited the presence of a positive relationship between these constructs. Perry-Smith and Mannucci (2017) suggest that Entrepreneurial Leadership practices allow firms to produce relevant, contextually-appropriate and novel products, knowledge, skills, systems and processes that may sustain the organisation's viability and resilience through exploration. Additionally, Gamache *et al*. (2015) empirically demonstrate that managers' positive explorative orientation is improved when leadership practices encourage engagement in uncertain and unpredictable trials and ventures. The extant literature thus confirms the significance of Entrepreneurial Leadership. The findings of this study reveal the existence of a moderate relationship, which is relevant and significant, leading to the rejection of the null hypothesis. Unlike that for Operational Leadership, this finding shows that an increase in Entrepreneurial Leadership has a significant, direct, positive effect on Organisational Adaptability and explains 38.2% of its variance. The researchers expected this outcome as the literature

suggests that Entrepreneurial Leadership practices, such as creativity, exploration, collaboratively linking up diverse agents, brokerage and flexibility lead to Organisational Adaptability.

The moderate strength of the relationship could be attributable to the levels of entrepreneurial practices in the target population. Lei, Waller, Hagen, and Kaplan (2016) note that certain leadership behaviours during non-routine circumstances lead to temporal episodic performance, resulting in u-shaped adaptiveness.

As such, and specifically regarding internal adaptation, the sample in this study was of relatively low resources slack and capability endowments compared to large, established firms. Consequently, under Covid-19, a non-routine circumstance, Entrepreneurial Leadership tendencies may have been curtailed because of limited stakeholder enrolment in conditions of uncertainty (cf. Burns, Barney, Angus, and Herrick, 2016; Townsend, Hunt, McMullen, and Sarasvathy, 2018). The respondents may not have rated the Entrepreneurial Leadership practices and outcomes in their firms highly. Nonetheless, this finding confirms Uhl-Bien and Arena's (2017, 2018) propositions, and makes a significant contribution to advance the under-explored field of Complexity Leadership and its impact on Organisational Adaptability.

Enabling Leadership explains 22.9% of the variance in Organisational Adaptability. The researchers expected this outcome, mainly because of Uhl-Bien and Arena's (2017, 2018) theoretical propositions, which are supported by other similar findings (Diesel and Scheepers, 2019; Khalili, 2017). This finding signifies that an organisation's ability to embrace the appropriate levels of Enabling Leadership practices significantly enhances its ability to create Organisational Adaptability, especially at the three levels suggested by Sarta *et al*. (2020). Based on an abductive retroduction of this finding, this weak association could be attributable to the SME population, for whom some of the nuances of Enabling Leadership are counterintuitive (see Tourish, 2019; Tsoukas, 2017), as they are perceived as undermining their authority (see Pentland, Feldman, Becker, and Liu, 2012; Schneider *et al*., 2017). This behaviour is prevalent in contexts characterised by higher levels of power distance and hierarchy (e.g., Kirkman *et al*., 2009). These positive findings clearly offers significant insights into Complexity Leadership Theory and Organisational Adaptability.

The findings of this study show that the path coefficient for Operational Leadership increased when moderated by Dramatic Social Change. This implies that in the model, Dramatic Social Change has positive enhancing effects on increases in Operational Leadership, increasing the firm's adaptability capabilities, especially at the internal level. The researchers expected this finding. Given that de la Sablonnière (2017) found that Dramatic Social Change is associated with a rapid pace of change and the rupture of normative structures, it would be reasonable and credible to expect that, in these contexts, many leaders tend to act to preserve liquidity and adapt working routines.

Invariably, this promotes a more inward review of resource and competency levels (Sarta *et al*. 2020). The findings illustrate that the path coefficient for Entrepreneurial Leadership increased, confirming a significant enhancing but moderate moderating effect. This outcome implies that Dramatic Social Change also has positive enhancing effects on increases in Entrepreneurial Leadership. This strengthens the firm's adaptability, especially at the market level (Sarta *et al*., 2020). Considering the literature, this finding was unsurprising. It underpins de la Sablonnière (2017)'s contribution to the extant knowledge on context moderation within the Complexity Leadership Theory scholarship. She suggests that, in the midst of Dramatic Social Change, the rapid pace of change, rupture of normative and social structures, and the threat to cultural identity could trigger the intensification of Entrepreneurial Leadership practices, which then would increase the impact on Organisational Adaptability.

This study's findings show that the path coefficient for Enabling Leadership increased and that 40.3% (up from 22.9%) of the variance in Organisational Adaptability is attributable to the enhancing effects of Dramatic Social Change on Enabling Leadership. Dramatic Social Change poses an existential threat to businesses and leaders would be expected to exhibit deeper and stronger Enabling Leadership practices that shift them from the leadership required during stable conditions. The researchers reason that the need to survive within Dramatic Social Change contexts may force leaders to increase their skill levels, for example by patterning their attention (Osborn and Marion, 2009) to new information sources or developing more in-depth and broader networks (Perry-Smith and Mannucci, 2017), which in turn would increase their Organisational Adaptability.

The effect size, f2, is important to identify the rank order of a construct in the hypothesised relationships and therefore the extent to which it explains a criterion construct (Hair *et al*., 2019, Nitzl *et al*., 2016). The results show that the highest rank-order on the direct effects is Entrepreneurial Leadership, which has a medium effect that increases under moderation. Enabling Leadership returned the second largest, although small, effect size on the direct relationship, while its effect size when moderated by Dramatic Social Change rises significantly to medium. The findings further show that Operational Leadership has a small effect size directly, although this too rises significantly, although it remains small, under moderation. These effect size findings are significant as they confirm the importance of Entrepreneurial Leadership practices over the other leadership practices in enabling Organisational Adaptability in the firm. The finding suggests that Entrepreneurial Leadership would yield the biggest positive impact on firms' ability to adapt. Furthermore, the increase in the impact of Enabling Leadership, under moderation of Dramatic Social Change, places it as equally important.

Implications for business

Uhl-Bien *et al*. (2007) posit that the success of organisations today resides more in their social assets, such as their ability to learn and adapt, than in their tangible assets. This was vindicated with the Covid-19 induced Dramatic Social Change. This implies that even when endowed with resource slack, there

is a fundamental need for leaders to espouse Complexity Leadership practices that prepare organisations for adaptation in anticipation of ongoing complexity pressures, instead of only relying on fallible forecasts. Organisations should design Complexity Leadership training that allow firms to navigate the multidimensional and ever evolving complex disruptions on the business landscape (e.g. geopolitical wars such as Ukraine War and Healthcare induced complexities as those ascribed to Covid-19). The study empirically confirmed that Complexity Leadership practices promote Organisational Adaptability. Therefore, by adopting Complexity Leadership, leaders are encouraged to shift competency, remuneration and reward models. Leaders must adapt human resources practices, to foster a shift to roles beyond the corporate boundary. The need for Enabling and Entrepreneurial Leadership practices such as co-action, co-creation, brokering, decentralisation, as well as establishing increased collaboration was made all too clear by Covid-19 induced complexities.

Furthermore, corporate leaders have to view Organisational Adaptability as a strategic advantage which endears their firms to take advantage of emerging complexity-triggered opportunities within the supply chain, service differentiation and new market acquisitions. It is thus recommended that leaders endeavour to understand the levels of adaptation that are required. Different levels adaptations will require a different combination of Complexity Leadership practices. Leaders could prepare their firms to effectively decern the type of practices needed during stable and unstable periods. For example, when the adaptation sought is internal, Operational Leadership practices are more appropriate. Whereas, if the motive is market adaptation, Entrepreneurial Leadership and Enabling Leadership are more appropriate. Finally, if institutional level adaptation is required, bureaucratic systems fall short of creating the adaptive space, therefore all three types of Complexity Leadership practices are needed. Institutional level adaptation require shifting processes and instituting novel ways, collaborating with new players in new ways, whilst enabling followers to thrive and grow.

The findings about the nature and strength of the relationships established in the study inform business leaders about the combinations of leadership practices they should focus on to ensure appropriate Organisational Adaptability. The findings on the moderating effects of Dramatic Social Change highlight the importance of Enabling Leadership in complex Dramatic Social Change contexts. Organisations must take note that even the less influential Operational Leadership practices become more critical when bounded by Dramatic Social Change.

Theoretical contribution

Embedded within the context of the unprecedented Covid-19 pandemic, the current study offered a unique opportunity to apply theoretical constructs and conduct an empirical study. This study is significant, since there is an absence of credible empirical studies on de la Sablonnière's (2017) Dramatic Social Change theory. The current study confirmed that Dramatic Social Change can be empirically tested. This study also offers a scale to measure the moderating effect of a Dramatic Social

Change, such as the Covid-19 pandemic. This scale makes a contribution to the domain of Dramatic Social Change and might be used by researchers in future in events of social disruption, such as experiencing a global pandemic. Much more fundamentally, the study contributes to the debate about Dramatic Social Change, about how it sets boundary conditions for leadership. Furthermore, the study concluded that Dramatic Social Change does indeed have positive enhancing effects on Complexity Leadership and therefore sheds more light on the moderation of leadership by context (e.g., Gardner *et al*., 2017; Hiller *et al*., 2019; Johns, 2017; Oc, 2018). Crane *et al.* (2016) posit that one of the three levels of theory contribution is "theory testing and refinement" (p.785). This study can claim to have achieved this, having successfully tested the theoretical conceptualisation of Complexity Leadership and Dramatic Social Change.

This work integrated the theoretical propositions about Dramatic Social Change (de la Sablonnière, 2017), Complexity Leadership (Uhl-Bien and Arena, 2017, 2018) and Organisational Adaptability (Sarta *et al*., 2020) to advance an understanding of their unique interaction. The additional consideration of the context of Dramatic Social Change moved the theory to a clearer conceptual characterisation that may aid future scholarship in leadership and strategic management.

The current study offered a unique contribution in terms of the analytical approach as follows: Previous studies in this field tended to specify construct indicators as reflective measures in factor-based models. The analytical approaches used were either CB-SEM or linear regression. This study differed in approach in that the MIMIC measurement model applied formative measures to the Complexity Leadership and Dramatic Social Change constructs and reflective measures to the Organisational Adaptability construct. The subsequent application of PLS-SEM analysis appears to be unique within the Complexity Leadership Theory empirical literature as the researchers could not find any studies using this approach.

Future research recommendations

The study empirically confirmed the appropriateness of the direct application of operational, entrepreneurial and enabling leadership as constructs in future studies. This opens many avenues for future research as it revealed the subtle factor configurations and underlying logic behind the qualitative conceptualisation of Complexity Leadership Theory into quantitative reality, thereby deepening and modifying our knowledge about the theory.

This study used a cross-sectional design which limits the causal implications of the findings. Future studies should consider longitudinal designs that may shed more light on the causal efficacy of Complexity Leadership on Organisational Adaptability. This study was based on the SME population in Zimbabwe, which has a national culture of high power distance, and this may have impacted respondents' perceptions. Therefore, there is a need for replication studies in other populations with

different cultural contexts to shed more light on the development of both Complexity Leadership and Dramatic Social Change theories.

Conclusion

While leaders have to usually implement practices and processes that drive the organisation's ability to adapt (Uhl-Bien *et al*., 2020), Dramatic Social Change even requires an acceleration of this adaptation. In this regard, the current study offered evidence of the moderating effect of a complex Dramatic Social Change, i.e. Covid-19, within the SME sized businesses in Zimbabwe, which is an underreached area. In closing, the findings of this study show the positive impact of entrepreneurial leadership (which includes practices like encouraging creativity, exploration, collaboration, as well as purposefully putting diverse stakeholders in contact with one another) on the organisation's adaptability, especially under the condition of Dramatic Social Change. This study illustrates the importance for organisations to take notice of the impact of leadership practices on effectively adapting to Dramatic Social Change.

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Table 1 Construct reliability and average variance extracted results

	Cronbach's Alpha (α)	Joreskog's Composite Reliability (CR)	Dijkstra-Henseler's rho$_A$	Average Variance Extracted
Organisational Adaptability	0.928	0.936	0.937	0.578
Enabling Leadership				0.560
Operational Leadership				0.552
Entrepreneurial Leadership				0.578
Dramatic Social Change				0.504

Table 2 Organisational adaptability discriminant validity results

	EnableLead (ENALEAD	Entrelead (ENTLEAD)	Modsc (DSC)	Oplead (OPLEAD)	OrgAdap (OA)
EnableLead (ENALEAD)					
EntrLead (ENTLEAD)	0.761				
ModDsc (DSC)	0.436	0.492			
OpLead (OPLEAD)	0.78	0.815	0.353		
OrgAdap (OA)	0.602	0.672	0.516	0.603	

Table 3 Variance inflation factor (VIF) values for all reflective measurements

	EnableLead	Entrelead	ModDsc	Oplead
EnabLead_1 Our leaders facilitate dialogue and discussion to help employees share knowledge in developing a shared understanding of issues	2.61			
EnabLead_10	1.993			
EnabLead_11	2.653			
EnabLead_12	1.847			
EnabLead_13	1.944			
EnabLead_19	2.375			
EnabLead_2	2.475			
EnabLead_20	1.933			
EnabLead_21	2.685			
EnabLead_22	3.504			
EnabLead_6	3.177			
EnabLead_7	2.626			
EnabLead_8 Our leaders create linkages between entities inside the organisation and with external stakeholders	3.152			
EntrLead_1		2.220		
EntrLead_14		2.594		

Item			
EntrLead_15	2.508		
EntrLead_16	2.501		
EntrLead_18 Our management motivates the employees to use new information sources within our industry	2.573		
EntrLead_19	2.872		
EntrLead_2	2.426		
EntrLead_7 Our executives actively search for new ideas and big opportunities	2.317		
ModDSC_1		1.360	
ModDSC_2		1.645	
ModDSC_4		1.892	
ModDSC_5		1.840	
ModDSC_6		2.244	
ModDSC_7 In our company, the level of impact on strategic planning and speed of execution has become dramatic		1.647	
ModDSC_8		2.086	
ModDSC_9 There has been a dramatic impact on the way and methods our teams use to communicate, operate and introduce new ideas in our company		1.750	
OpLead_11			2.610
OpLead_12			2.128
OpLead_13			2.504
OpLead_14			2.633
OpLead_15			2.476
OpLead_16			2.754
OpLead_17			2.728
OpLead_3			1.828
OpLead_4			1.430
OpLead_5 Our leaders develop specific policies to support our firm vision and purpose			2.315
OpLead_7			2.290
OpLead_8 In this organization, leaders translate the company's mission into specific goals			3.050
OpLead_9			2.624

Table 4 Formative measures of relevance and significance of attained values

Item	Original Sample (O)	Sample Mean (M)	Standard Deviation (STDEV)	T Statistics (|O/STDEV|)	P Values
EnabLead_1 <- EnableLead	0.081	0.08	0.009	8.981	0
EnabLead_10 <- EnableLead	0.066	0.065	0.007	9.111	0
EnabLead_11 <- EnableLead	0.067	0.068	0.009	7.659	0
EnabLead_12 <- EnableLead	0.058	0.059	0.011	5.109	0

EnabLead_13 <- EnableLead	0.059	0.06	0.011	5.558	0
EnabLead_14 <- EnableLead	0.041	0.041	0.011	3.756	0
EnabLead_16 <- EnableLead	0.079	0.078	0.01	8.120	0
EnabLead_17 <- EnableLead	0.05	0.05	0.011	4.550	0
EnabLead_18 <- EnableLead	0.055	0.055	0.01	5.611	0
EnabLead_19 <- EnableLead	0.065	0.065	0.009	7.193	0
EnabLead_2 <- EnableLead	0.075	0.075	0.007	10.137	0
EnabLead_20 <- EnableLead	0.081	0.081	0.011	7.351	0
EnabLead_21 <- EnableLead	0.072	0.072	0.011	6.431	0
EnabLead_22 <- EnableLead	0.065	0.066	0.008	8.617	0
EnabLead_23 <- EnableLead	0.033	0.033	0.01	3.254	0.001
EnabLead_3 <- EnableLead	0.078	0.078	0.009	8.940	0
EnabLead_4 <- EnableLead	0.065	0.065	0.008	8.492	0
EnabLead_5 <- EnableLead	0.058	0.059	0.01	5.871	0
EnabLead_6 <- EnableLead	0.058	0.058	0.009	6.716	0
EnabLead_7 <- EnableLead	0.057	0.056	0.009	6.097	0
EnabLead_8 <- EnableLead	0.064	0.064	0.009	7.381	0
EnabLead_9 <- EnableLead	0.055	0.055	0.01	5.496	0
EntrLead_1 <- Entrelead	0.106	0.105	0.013	7.960	0
EntrLead_12 <- Entrelead	0.095	0.094	0.012	8.221	0
EntrLead_11 <- Entrelead	0.108	0.108	0.013	1.540	0.133
EntrLead_10 <- Entrelead	0.101	0.092	0.016	1.585	0.113
EntrLead_14 <- Entrelead	0.122	0.122	0.012	9.990	0
EntrLead_15 <- Entrelead	0.098	0.098	0.011	9.104	0
EntrLead_16 <- Entrelead	0.102	0.102	0.015	6.998	0
EntrLead_17 <- Entrelead	0.081	0.081	0.014	5.872	0
EntrLead_18 <- Entrelead	0.105	0.103	0.013	7.854	0
EntrLead_19 <- Entrelead	0.099	0.098	0.013	7.791	0
EntrLead_2 <- Entrelead	0.109	0.109	0.015	7.412	0
EntrLead_3 <- Entrelead	0.068	0.068	0.014	4.778	0
EntrLead_4 <- Entrelead	0.07	0.071	0.015	4.495	0
EntrLead_5 <- Entrelead	0.038	0.036	0.018	2.100	0.036
EntrLead_7 <- Entrelead	0.088	0.088	0.01	9.002	0
EntrLead_6 <- Entrelead	0.118	0.108	0.069	1.406	0.15
EntrLead_8 <- Entrelead	0.083	0.082	0.013	6.187	0
EntrLead_9 <- Entrelead	0.084	0.083	0.015	5.462	0

ModDSC_1 <- Modsc	0.112	0.107	0.065	1.718	0.086
ModDSC_2 <- Modsc	0.164	0.158	0.068	2.391	0.017
ModDSC_4 <- Modsc	0.113	0.109	0.069	1.643	0.101
ModDSC_5 <- Modsc	0.118	0.112	0.061	1.918	0.055
ModDSC_6 <- Modsc	0.046	0.044	0.073	0.629	0.53
ModDSC_7 <- Modsc	0.311	0.309	0.073	4.274	0
ModDSC_8 <- Modsc	0.265	0.257	0.053	4.974	0
ModDSC_9 <- Modsc	0.277	0.27	0.067	4.142	0
OpLead_10 <- Oplead	0.084	0.083	0.011	7.781	0
OpLead_11 <- Oplead	0.095	0.095	0.013	7.278	0
OpLead_12 <- Oplead	0.091	0.091	0.017	5.369	0
OpLead_13 <- Oplead	0.077	0.077	0.016	4.853	0
OpLead_14 <- Oplead	0.07	0.07	0.015	4.554	0
OpLead_15 <- Oplead	0.078	0.077	0.015	5.066	0
OpLead_16 <- Oplead	0.082	0.083	0.015	5.552	0
OpLead_17 <- Oplead	0.104	0.104	0.014	7.358	0
OpLead_2 <- Oplead	0.07	0.069	0.014	5.040	0
OpLead_3 <- Oplead	0.074	0.073	0.017	4.509	0
OpLead_4 <- Oplead	0.083	0.082	0.018	4.701	0
OpLead_5 <- Oplead	0.095	0.094	0.016	5.754	0
OpLead_6 <- Oplead	0.111	0.111	0.017	6.583	0
OpLead_7 <- Oplead	0.096	0.097	0.018	5.333	0
OpLead_8 <- Oplead	0.119	0.118	0.015	7.759	0
OpLead_9 <- Oplead	0.071	0.07	0.016	4.458	0

Table 5 Construct VIF output

Formative Construct	Variance Inflation Factor (VIF)
EnableLead	2.437
EntrLead	2.656
OpLead	2.774
ModDsc	1.050

Table 6 R² values for endogenous variables

	R Square	R Square Adjusted
EnableLead	0.162	0.155

	0.187	0.181
Entrelead	0.187	0.181
Oplead	0.078	0.071

Table 7 Q² values for endogenous variables

	SSO	SSE	Q² (=1-SSE/SSO)
EnableLead	2646	2438.25	0.079
Entrelead	1890	1745.846	0.076
ModDsc	756	756	
Oplead	1764	1707.471	0.032

Table 8 Hypothesis verification using path coefficients, significance and relevance

Structural Path Direction	Path Coefficient Original Sample (O)	Path Coefficient Sample Mean (M)	Standard Deviation (STDEV)	T-Statistic (|O/STDEV|)	P Values	Decision
H1: Oplead -> OrgAdap	0.126	0.132	0.103	1.698	0.090	Not Supported
H2: Entrelead -> OrgAdap	0.355	0.382	0.090	3.949	0.000	Supported
H2: EnableLead -> OrgAdap	0.215	0.229	0.112	1.995	0.044	Supported
H4.1: Modsc -> Oplead	0.261	0.280	0.079	3.316	0.010	Supported
H4.2: Modsc -> Entrelead	0.402	0.433	0.057	7.528	0.000	Supported
H4.3: ModDsc -> EnableLead	0.382	0.403	0.065	5.575	0.000	Supported

Table 9 Effect sizes (f²)

	EnableLead	Entrelead	Modsc	Oplead	OrgAdap
EnableLead					0.035
Entrelead					0.118
Modsc	0.194	0.23		0.085	
Oplead					0.012
OrgAdap					