

Antecedents and consequences of individual absorptive capacity in times of crisis

Antecedentes e resultados da capacidade absorptiva individual em tempos de crise

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To cite this paper: Sousa, R. C. F. de., Costa, P. R. da., Silva, L. F. da., Ruas, R. L., & Dias, C. N. (2025). Antecedents and consequences of individual absorptive capacity in times of crisis. *Revista de Administração Mackenzie*, 26(2), 1–32. <https://doi.org/10.1590/1678-6971/eRAMD250399>

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Abstract

Purpose: This article examines the relationship between individuals' characteristics (motivation and cognition), individual absorptive capacity, and individual innovative performance in times of crisis.

Originality/value: The study contributes to emerging academic thinking on the micro-foundations of dynamic capabilities, self-determination theory as an antecedent factor, and individual innovative performance as a consequence factor of individual absorptive capacity. Regarding practical contributions, managers and entrepreneurs should invest in training in times of crisis, aiming to develop individual practices and skills to promote organizations' innovative capacity.

Design/methodology/approach: Data were collected through a questionnaire (survey). There were 320 respondents. Confirmatory Factor Analysis was applied to validate the constructs' items using PLS-SEM to test the hypotheses using the Smart-PLS2.0 software.

Findings: The results demonstrated that the dissociative cognitive style was the most significant predictor of individual absorptive capacity in times of crisis. It was also found that the level of extrinsic motivation had no effect when analyzed concerning the level of individual absorptive capacity in times of crisis. Finally, the findings showed a positive relationship between individual absorptive capacity and individual innovative performance. However, the times of crisis variable did not exert a moderating effect on this relationship.

Keywords: motivation, cognition, individual absorptive capacity, individual innovative performance, times of crisis

Resumo

Objetivo: Examinar a relação entre as características dos indivíduos (motivação e cognição), a capacidade absorptiva individual e o desempenho inovador individual em tempos de crise.

Originalidade/valor: O estudo contribui para o pensamento acadêmico emergente dos microfundamentos das capacidades dinâmicas, da teoria da autodeterminação como antecedente e do desempenho inovador individual como consequência da capacidade absorptiva individual. Sobre as contribuições práticas, gestores e empreendedores devem investir em capacitação em tempos de crise, visando o desenvolvimento de práticas e habilidades individuais, a fim de promover capacidade inovativa das organizações.

Design/metodologia/abordagem: Os dados foram coletados por meio de um questionário (*survey*). O número de respondentes foi de 320 e sobre essa totalidade foram aplicadas uma Análise Fatorial Confirmatória para validar os itens dos construtos e o PLS-SEM para teste das hipóteses com auxílio do software Smart-PLS2.0.

Resultados: Apurou-se que o preditor mais significativo da capacidade absorptiva individual em tempos de crise foi o estilo cognitivo dissociativo. Constatou-se ainda que o nível da motivação extrínseca não teve efeito quando analisado em relação ao nível da capacidade absorptiva individual em tempos de crise. Por fim, os achados mostraram uma relação positiva de consequência da capacidade absorptiva individual ao desempenho inovador individual, no entanto, a variável *tempos de crise* não exerceu um efeito moderador em tal relação.

Palavras-chave: motivação, cognição, capacidade absorptiva individual, desempenho inovador individual, tempos de crise

INTRODUCTION

In 2019, the Sars-CoV-2 virus, recognized as COVID-19, triggered a global health crisis (Bavel et al., 2020). In three months, the infection spread, generating more than 118,000 cases and 4,291 deaths in 114 countries, which led the World Health Organization (WHO) to declare a global pandemic. In 2022, the pandemic reached more than 33.5 million confirmed cases and 676 thousand deaths (CONASS, 2022). This context not only led to challenges in coping with the disease but also impacted how people work and relate to each other, which allows us to define it as a crisis time, thus conceiving it as one of the variables of this article.

Among other challenges in this crisis, it is possible to mention the boost of digital transformation (Nurhas et al., 2022) and supply chain changes (Raj et al., 2022). Thus, while efforts to develop pharmacological interventions to overcome COVID-19 were employed, researchers of public and private organizations also endeavored to provide valuable knowledge regarding the reorganization of society, promoting technological advances and readjusting production systems (Bartik et al., 2020; Bavel et al., 2020; Martins & Freire, 2023). In this sense, knowledge was the primary input to face the aforementioned challenges, which must flow between individuals and organizations to contribute to practical and innovative solutions (Yildiz et al., 2024; Snehvrat et al., 2022). The ability to continuously renew, develop, and transfer assets based on knowledge was, and still is, a central goal of public and private organizations in dealing with crises.

Martins and Freire (2023) point out that during the COVID-19 pandemic, at least a quarter of Brazilian startups were negatively impacted. The authors argue that startups' Absorptive Capacity (AC) can determine their capacity for innovation and survival, including during crises such as the COVID-19 pandemic. Malvestiti et al. (2021) describe how AC is related to the capacity for social innovation and is, in turn, oriented towards sustainability and organizational sustainability.

CA stands out as the competence to support constant learning and innovation in organizations (Pedrosa et al., 2022; Van Wijk et al., 2008), being considered a dynamic capability at the organizational level and concerning the identification and acquisition of external knowledge as well as its integration with internal knowledge via transformation and exploration (Zahra & George, 2002; Lichtenthaler & Lichtenthaler, 2009). In this line, studies such as those by Lichtenthaler (2011) and Martins and Freire (2023) examined the AC phenomenon at the organizational and interorganizational levels.

However, there is a growing demand for studies on AC at the individual level (Lowik et al., 2017), as individuals represent the primary agents of knowledge creation and innovation (Bogers et al., 2017; West & Bogers, 2017; Yildiz et al., 2024), which also means that individuals are responsible for changes both in periods of normality and in times of crisis.

INDIVIDUAL AC: CURRENT STATE OF DISCUSSIONS AND RESEARCH APPROACH

In this article, we start from the premise that the search for solutions to everyday problems and the creation of knowledge aimed at generating innovations to deal with moments of crisis is part of the interaction and disposition of individuals (Yildiz et al., 2024). Thus, creating and converting knowledge depends on the recursive transition between its tacit and explicit forms, depending on interactional processes mediated by mechanisms made available by the organization (Chiu et al., 2023). It is worth mentioning that tacit knowledge is not easily codified, making it difficult to convert and share. On the other hand, explicit knowledge is codified and generally easily shareable.

Yildiz et al. (2024) and Snehvrat et al. (2022) point to the need for studies that address individual AC, arguing that individuals play a fundamental role in absorbing new knowledge. Despite this lack, research has explored individual AC to understand how organizations undertake open innovation (Lowik et al., 2017). Santos et al. (2020a) evaluated individual AC and entrepreneurial intention in successors of rural properties in cooperative systems. Tian and Soo (2018) observed that organizational commitment to learning, employees' intrinsic motivation, and creativity and performance positively impact individual AC results.

Therefore, starting from the understanding that individual AC is an element and a resource for organizational AC (Agostineto et al., 2022), it is also necessary to understand how essential factors to the individual, such as cognition and motivation, affect AC. In this sense, Jiménez-Castillo and Sánchez-Pérez (2013) and Chiu et al. (2023) demonstrated how individual AC was influenced by motivation, cognition, and the diversity of external networks. Individual AC was also shown to enhance favorable results regarding task performance (Park et al., 2007), knowledge creation, and innovation (Tortoriello, 2015; Ter Wal et al., 2017; Enkel et al., 2017). Accordingly, based on the Self-Determination Theory (Ryan & Deci, 2000), it is necessary to examine the different types of motivation (intrinsic and



extrinsic) and cognition (associative and dissociative) of the organization's employees, these antecedents being distinct from AC individuals.

Another relevant aspect to point out in this article is that, until now, there have been opportunities for research into capabilities, individual behaviors, and innovation during times of crisis similar to the COVID-19 pandemic. Some studies found a significantly negative relationship in this sense (Golparvar et al., 2012; Wang et al., 2020), while others found a non-significant relationship (Abbas & Raja, 2015; Bani-Melhem et al., 2018; Teng et al., 2021). It is also worth mentioning that this type of context has become increasingly recurrent, given the problems of environmental crises and wars.

Therefore, the link between individual characteristics, knowledge absorption, and innovative performance in times of crisis deserves to be the subject of further studies. Consequently, when we assume that crises affect individuals' cognitive and motivational aspects due to the ambiguities and uncertainties inherent to such moments. We also assume that this situation affects individual AC and is associated with the absorption and creation of knowledge at the organizational level. Thus, by understanding how situations of uncertainty and crisis arise from the COVID-19 pandemic, it is possible to infer that the individual's AC must be driven by the intrinsic interest in learning and personal development for the absorption and creation of knowledge and innovation in the organization (Tian & Soo, 2018).

On the other hand, by stimulating individual action through clear and observable results, extrinsic motivation can undermine certain aspects of AC (Chiu et al., 2023). Hence, distinguishing between different types of motivation is essential to further refinement of individual AC and its antecedents. As motivational and cognitive factors can influence individual AC, it is possible to assume that the ability to innovate by generating new products, services, or processes will also be impacted (West & Bogers, 2017), especially in crisis contexts. Therefore, when analyzing individual AC, individual innovative performance is adopted here as its consequence (Lowik et al., 2017). This article examines the relationship between individuals' characteristics (motivation and cognition), individual absorptive capacity, and individual innovative performance.

The development of this work enabled progress on two fronts. Firstly, there is a debate about the relationship between individual AC and times of crisis in the environment. Second, it was observed how two antecedents of individual AC – motivation and cognition – are affected in times of crisis. Through the methodological trajectory we employed, it was possible to



empirically examine the different types of motivation and cognition, as well as how they were used to develop individual AC and improve the innovative performance of people who worked in RD&I (Research, Development, and Innovation) during the COVID-19 pandemic.

In addition to the antecedents of individual AC, its results were also examined, that is, its impact on the innovative performance of individuals who worked on RD&I activities in critical periods such as the COVID-19 pandemic. Such performance represents an important source of organizational innovation and competitive advantage in crisis contexts in general (Gong et al., 2013). Finally, the moderating role of crisis times was evaluated in the relationship between individual AC and individual innovative performance during the COVID-19 pandemic.

THEORETICAL BACKGROUND AND HYPOTHESES

This article examined individuals' cognitive and motivational factors and capabilities from a knowledge management perspective focused on AC at the individual level (Cohen & Levinthal, 1990; Lichtenthaler, 2011; Lowik et al., 2017). In this sense, it is necessary to remember that we start from the premise that individual-level factors represent a critical antecedent of the capabilities to generate solutions and innovate at the organizational level (Regnér & Zander, 2014; Tian & Soo, 2018; Martins & Freire, 2023), in the same way that an organization's AC depends on that organization's knowledge absorption capabilities (Lane et al., 2006; Tian & Soo, 2018).

In other words, individual AC forms the basis of organizational AC and can be leveraged both by individual characteristics and by the motivation and cognition of individuals in the activity of knowledge absorption, as well as the transformation and exploitation of this knowledge (Lowik et al., 2017; Santos et al., 2020b). Likewise, organizations must promote actions that facilitate the use of organizational mechanisms, assist in the socialization of knowledge (Zahra & George, 2002; Todorova & Durisin, 2007), or even in the transference of knowledge (Jansen et al., 2005) to contribute to the promotion of individual AC.

It is worth highlighting that AC is mainly treated as a collective phenomenon and studied at the level of teams (Nemanich et al., 2010), alliances between organizational actors (Lane & Lubatkin, 1998; Newey & Verreyne, 2011; Enkel & Heil, 2014), industrial districts and, more commonly, the organizational level (Jansen et al., 2005; Lane et al., 2006; Volberda et al.,



2010). In this context, several scholars argue about the need for more empirical studies on individual AC (Lane et al., 2006; Yildiz et al., 2024), and in response to these calls, recent research has begun to advance the understanding of AC in individual level (Jiménez-Castillo & Sánchez Pérez, 2013; Ter Wal et al., 2017; Snehrvat et al., 2022). Accordingly, some studies sought to examine the link between individual AC and elements such as cognition and the impacts of this conjunction on individual learning (Martinkenaite & Breunig, 2016; Yao & Chang, 2017; Yildiz et al., 2019), while others proposed to verify whether social interaction affects individual AC (Tortoriello, 2015).

In this sense, it is necessary to understand how the context also interferes with personal characteristics such as cognition, motivation, and individual AC. Thus, based on the premise that crises such as COVID-19 have become recurrent, there is a lack of studies that assess the extent to which individual characteristics—such as motivation and cognition—influence the ability to absorb knowledge to improve solution creation.

Regarding individuals' motivational factors, although extrinsic motivation is an important generator of engagement about behaviors that result in the search for knowledge, intrinsic motivation also promotes positive results in individual AC (Chiu et al., 2023). Considering the Self-Determination Theory approach, we can infer that intrinsic motivation has a more significant influence than extrinsic motivation. In this way, intrinsic motivation has a greater capacity to influence the employee's results concerning their creativity, knowledge sharing, and performance in the innovation activity (Zhang & Bartol, 2010; Agostineto et al., 2022).

Self-determination theory was adopted to differentiate intrinsic and extrinsic motivation (Gagné & Deci, 2005), with these two dimensions of motivation also being examined as predictors of the development of individual AC (Chiu et al., 2023). Thus, we can infer that intrinsically motivated people work with more pleasure, embarking on a task because they find it enjoyable despite the absence of expectations of immediate extrinsic rewards (Williams & Deci, 1996; Ryan & Deci, 2000). Previous studies show that intrinsically motivated individuals have a natural basis for learning and professional development (Vansteenkiste et al., 2004; Vansteenkiste et al., 2006).

Regarding times of crisis, due to the high degree of ambiguity and uncertainty, learning processes may not produce adequate results. This situation can lead the individual to exert minimal effort to solve problems and achieve results (Reinholt et al., 2011; Santos et al., 2020a). Consequently, some of the knowledge acquired and assimilated may not be recovered or may even become useless, depriving the individual of recognition or motivation for





their efforts to identify and assimilate new knowledge (Chiu et al., 2023). This implies that individuals need to be motivated to learn to explore new ideas and assimilate external knowledge, even if the results of such efforts are not immediate or visible (Rigolizzo & Amabile, 2015; Lowik et al., 2016). Other research, such as Reinholt et al. (2011), also shows that intrinsic and autonomous motivation leads to higher effort, perseverance, and persistence. In a resume, it is important to sustain the desire of individuals to obtain the necessary skills to absorb new knowledge in situations of ambiguity and uncertainty.

In contrast to intrinsic motivation, extrinsic motivation is salient when the activity leads to material rewards and explicit recognition (Gagné & Deci, 2005). Thus, extrinsically motivated professionals are more likely to respond to pressure from external regulations and/or self-imposed pressure (Deci & Ryan, 1985). When an individual has strong extrinsic motivation, he regulates his efforts in response to external mandates and incentives (Reinholt et al., 2011).

Considering the uncertainties and risks associated with absorbing new knowledge, extrinsic motivation may cause individuals to reduce effort in their tasks in times of crisis (Rigolizzo & Amabile, 2015; Deci & Ryan, 1985). This reasoning suggests that different forms of motivation play different roles in developing individual AC in a critical context (Tian & Soo, 2018). Therefore, intrinsically motivated professionals would be more inclined to develop skills necessary for highly ambiguous and uncertain tasks regarding knowledge absorption in scenarios such as the COVID-19 pandemic, as studied by Martins and Freire (2023). Otherwise, extrinsic motivation would induce individuals to refrain from seeking new ideas due to a less permanent and intense stimulus related to external rewards. Based on this context, the following hypotheses were formulated:

- **H1a.** The higher the level of intrinsic motivation, the higher the individual absorptive capacity in times of crisis.
- **H1b.** The higher the level of extrinsic motivation, the higher the level of individual absorptive capacity in times of crisis.

Despite the relevance of motivational factors, individuals' cognitive abilities interfere with learning, problem-solving, and creativity (Cohen & Levinthal, 1990; Lane et al., 2006; Todorova & Durisin, 2007). Individual cognition is how individuals process information and make decisions (Fiske & Taylor, 2013). It is still opportune to test the relationship between individual cognition and individual AC, especially in times of crisis.





Koestler (1964) differentiated cognitive styles between dissociative and associative to explain individual information processing and decision-making differences. Dissociation is a decision-making style in which individuals use imagination and intuition to seek solutions outside of disciplinary boundaries, discovering unreadily apparent connections. Payne et al. (1990) indicate dissociation involves unlearning and changing the “rules of the game.” Otherwise, individuals with an associative style tend to rely on rational thinking, emphasizing verbal reasoning and articulating expressions of ideas (Jabri, 1991). They pay attention to aspects of a problem for which conventional solutions are at hand and attempt to adhere to existing rules and methodologies within disciplinary boundaries (Payne et al., 1990).

Unlike other cognitive style dimensions, dissociation and association cognitive styles are not antagonistic but are independent subscales (Payne et al., 1990). It is argued that individuals have both styles but may prefer one depending on the task.

The literature on AC talks about how the creation of knowledge involves combining existing knowledge with the generation of new knowledge and ideas. This creative process is more facilitated by the dissociative cognitive style in times of crisis (Todorova & Durisin, 2007; Zahra & George, 2002). Furthermore, the dissociative style encourages the absorption of external knowledge since individuals endowed with this cognitive style tend to seek differences and unknown solutions in situations of uncertainty and ambiguity. Thus, it is expected that the dissociative cognitive style has a positive relationship with individual AC in times of crisis (Lowik et al., 2017), as it is necessary to incorporate new work methods, which require openness to change and unlearning. Thus, the following hypotheses were formulated:

- **H2a.** The higher the level of dissociative cognitive style, the higher the level of individual absorptive capacity in times of crisis.
- **H2b.** The higher the level of associative cognitive style, the higher the level of individual absorptive capacity in times of crisis.

As motivational and cognitive factors can influence individual AC, we can assume that the ability to innovate will also be impacted by them (West & Bogers, 2017). Thus, individual innovative performance is understood as a consequence of individual AC. According to Lowik et al. (2017), individual innovative performance is related to idea generation and exploration. Thus, generating ideas requires individuals to be creative in decision-making (Lane et al., 2006), doing it to anticipate unexpected problems and solve them (West & Farr, 1990). These new ideas result from recognition, assimilation,





lation, and transformation activities (Agostineto et al., 2022). Additionally, exploring ideas results from implementing ideas generated by these individuals or others (Zahra & George, 2002).

According to Schweisfurth and Raasch (2018), employees' innovative performance will be positively related to their ability to identify needs and promote solutions. Recognition of user needs related to their experiences and problems when using a product or new applications is crucial for innovation. Therefore, assessing external knowledge and needs is crucial for selecting economically important directions for innovation (Martinkenaite & Breunig, 2016; Yao & Chang, 2017). Consequently, professionals with high need AC can frame external need knowledge within existing cognitive schemas (assimilation) or can construct new knowledge structures to accommodate it (transformation) (Todorova & Durisin, 2007; Yildiz et al., 2019), enabling its application in organizational innovation.

To effectively use external knowledge for innovation, individuals must draw on external resources and evaluate the value of the knowledge to be absorbed (Dahlander et al., 2016). Professionals with high solution AC can identify and evaluate external solution knowledge earlier and more accurately than individuals who do not have this capacity. Thus, they are more likely to absorb valuable knowledge for innovation, which makes them capable of assimilating knowledge from the external solution and exploiting it for innovation.

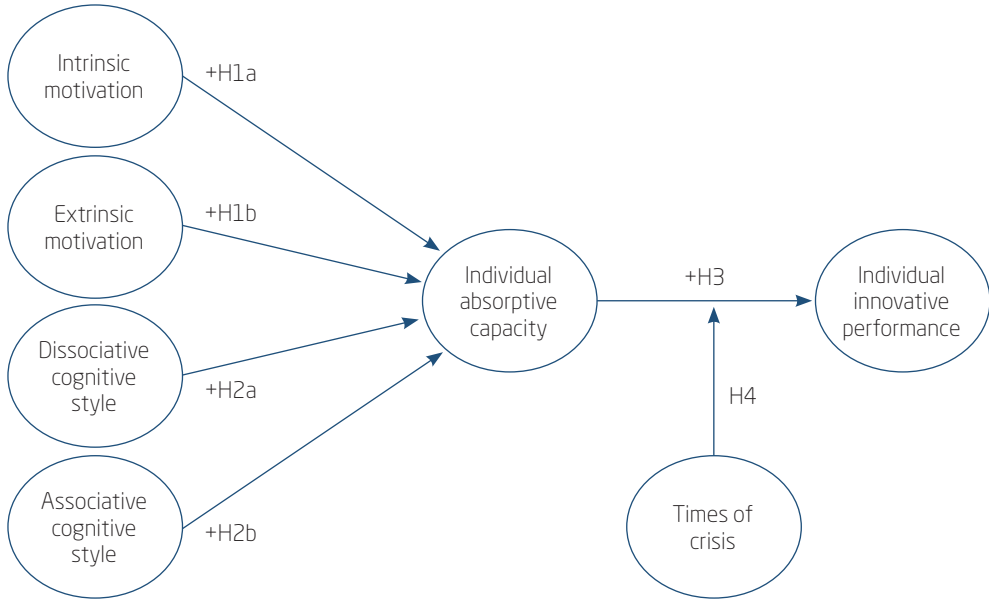
Therefore, individual AC is expected to have a positive relationship with individual innovative performance in critical scenarios, such as the COVID-19 pandemic. Furthermore, times of crisis are expected to moderate the relationship between individual AC and individual innovative performance. Thus, the following hypotheses are formulated:

- **H3.** The higher the level of individual absorptive capacity, the higher the level of individual innovative performance in times of crisis.
- **H4.** Time of crisis moderates the relationship between individual absorptive capacity and individual innovative performance.

Figure 1 presents the conceptual model of this research and the legend of the constructs.



Figure 1
Conceptual model and hypotheses



MATERIALS AND METHODS

This research is quantitative, following a hypothetical-deductive orientation, and uses a survey. To test the hypotheses, a research instrument based on validated scales was constructed and made available by QuestionPro from December 2019 to March 2022. Invitations to participate in the research were sent via email, LinkedIn, and WhatsApp, along with a link to access the questionnaire.

The survey respondents' profiles include individuals who worked on RD&I activities during the COVID-19 pandemic. The reason for the choice was that such individuals should continually deal with the absorption of internal and external knowledge to make decisions that potentially result in innovations. The qualification of this research subject allowed access to the phenomenon studied here. In this way, it was tested to determine what measure of individual innovative performance is influenced by individual AC, which in turn is affected by motivational and cognitive factors in times of crisis.

The sampling obtained was for convenience, and based on the selected profile, we sought, through invitation, to obtain a sample suitable for the

variables tested. The GPower software was used to calculate the sample size, as Faul et al. (2007) and Ringle et al. (2014) recommended. A power test of 95% (0.95) was adopted, with GPower indicating the need to collect at least 92 valid responses. This number was tripled following sampling practices in research of this type, considering that the model includes a moderation test. Thus, the recommendation for the final sample resulted in 276 respondents as a minimum sample. After applying the questionnaires, 478 responses were obtained, of which 148 were disregarded due to incomplete responses. Finally, 330 valid responses were obtained and passed through the analysis process.

To construct the research instrument, the scales initially developed in English underwent the back-translation process to guarantee cross-cultural equivalence. Furthermore, they underwent adaptation to consider the crisis factors, which were directly associated with the period of the COVID-19 pandemic. The complete questionnaire was validated by six experts in AC and innovation who are fluent in English and are professors and researchers in the administration who work in *stricto sensu* postgraduate programs. Therefore, to achieve greater refinement of the research instrument and avoid problems, as well as to correct any deficiencies and check the time taken to respond to the questionnaire, a pre-test was carried out with 20 respondents, who attested to their understanding of the questions, validating the instrument (Hair Jr. et al., 2009).

It is worth explaining that the face and content validation procedures seek to preserve the scales' main characteristics in measuring the constructs involved (Malhotra, 2007). Thus, the questionnaire sought the respondent's perception of the phenomenon investigated based on a 7-point Likert scale, ranging from 1 (totally disagree) to 7 (totally agree). All question blocks were randomized, and the ordering of the scale items was changed—this action aimed to mitigate response bias that can harm self-administered questionnaires.

The research questionnaire consisted of 43 items referring to the constructs studied, and five variables were used to characterize the sample properly. The scale used for the intrinsic motivation variable was that of Gagné et al. (2010). This scale showed good reliability and validity in the study by Yildiz et al. (2019). The scale by Gagné et al. (2010) was also used for the extrinsic motivation variable, which showed good reliability and validity in the study by Yildiz et al. (2019).

The cognitive style variable was evaluated as a decision-making heuristic, and for this purpose, Jabri's (1991) differentiation between association and dissociation was used. It is worth explaining that Jabri's (1991) scale is

based on Koestler’s (1964) research on creativity, which is also cited in the article by Zahra and George (2002) and Todorova and Durisin (2007). This scale showed good reliability and validity in the study by Lowik et al. (2017).

The Lowik et al. (2016) scale was used for the individual AC variable, a second-order construct consisting of individual activities of recognition, assimilation, transformation, and application of new external knowledge. This scale achieved good reliability and validity in Lowik et al. (2017) and Agostineto et al. (2022) studies.

Individual innovator performance was measured using the Lowik et al. (2017) scale. This scale showed good reliability and validity in Ng and Feldman (2010) and Agostineto et al. (2022) studies. Finally, the Billings et al. (1980) scale was considered adaptively for the moderating variable times of crisis. The indicators on this scale seek to assess the threat of loss of value, the uncertainty about the individual’s decision-making actions depending on the probability of this loss occurring or not, as well as measuring the time pressure to make decisions. It is worth noting that this scale showed good reliability and validity in the study by Santos et al. (2020b). Table 1 presents all tested constructs and their respective scales.

Table 1
Variables, scale items, and sources

Variables	Scale items	AC
Individual innovative performance (Lowik et al., 2017)	Idea creation: I suggest innovations and improvements regarding the creation of new products or services. I suggest innovations and improvements relating to the improvement of existing products or services. I suggest innovations and improvements regarding the creation of new working methods. I suggest improving existing work process.	0,90
	Implementation of ideas: I actively participate in the implementation of RD&I or improvement activities to create new products or services. I actively participate in the implementation of RD&I or improvement activities to improve existing products or services. I actively participate in the implementation of RD&I or improvement activities to create new work methods. I actively participate in the implementation of RD&I or improvement activities to improve existing work processes.	

(continues)

Table 1 (continuation)
Variables, scale items, and sources

Variables	Scale items	AC
Individual AC (Lowik et al., 2016)	Recognition: I am always actively seeking new knowledge for my work. I intentionally seek knowledge in different places to come up with new ideas. I am good at distinguishing between suitable implementation opportunities and not-so-suitable implementation opportunities. I easily identify which new knowledge is most valuable.	0,92
	Assimilation: I frequently share my new knowledge with colleagues to establish a common understanding. I translate new knowledge in such a way that my colleagues understand what I mean. I communicate newly acquired knowledge that may be of interest to colleagues.	
	Transformation: I usually meet with colleagues to come up with good ideas. I attend meetings with people from different sectors/departments to come up with new ideas. I develop new ideas from the knowledge that is available. I can transform existing knowledge into new ideas.	
	Application: I usually apply newly acquired knowledge to my work. I apply new knowledge to create new products, services or working methods. I always consider how I can apply new knowledge to improve my work.	
	Times of crisis (Billings et al., 1980)	The COVID-19 pandemic threatened the organization I work for with financial losses. The COVID-19 pandemic has involved some uncertainty about the actions to be taken. The COVID-19 pandemic has resulted in severe new pressures on people. The COVID-19 pandemic has caused a lot of uncertainty about what actions to take in a crisis situation. I felt under a lot of pressure to make decisions related to the COVID-19 pandemic crisis.

(continues)

Table 1 (conclusion)***Variables, scale items, and sources***

Variables	Scale items	AC
Intrinsic motivation (Gagné et al., 2010)	I am doing this work because I really like it. I am doing this job because I have fun doing my job. I am doing this work for the moments of pleasure that this work brings me.	0,90
Extrinsic motivation (Gagné et al., 2010)	I am doing this work because this work gives me a certain standard of living. I am doing this job because it allows me to earn a lot of money. I am doing this job for the pay.	0,74
Associative cognitive style (Jabri, 1991)	I like to be methodical and consistent in the way I solve problems. I like to pay strict attention to the sequence of steps required to complete a job. I like to be rigorous in producing results, as and when necessary. I like to be precise and accurate when producing results and reports.	0,82
Dissociative cognitive style (Jabri, 1991)	I like to pursue a problem, especially if it leads me into areas I do not know much about. I like to link ideas that derive from more than one area of research. I like to be completely occupied with what appear to be new solution methods. I like to look for new approaches that are not necessary at the moment. I like struggling to make connections between seemingly unrelated ideas. I like to spend time tracing relationships between different areas of work.	0,84
Profile of individuals	Age; gender; academic education; office; time in current position; time in current employment organization; size of the current link organization; and sector of the current link organization.	-

After data collection, outliers and observations that presented different response patterns from those of the others were analyzed. The pairwise correlations of the variables were analyzed to verify the data's linearity, as a significant correlation coefficient at the 5% level indicates linearity. Furthermore, the Bartlett test was performed to verify linearity in each construct. In the descriptive analysis of quantitative variables, measures of central tendency, position, and dispersion were used.

Initially, this research adopted a Confirmatory Factor Analysis (CFA) based on the proposition of hypotheses constructed from construct theories

(Hair Jr. et al., 2016). Thus, to evaluate the relationships between the constructs used, a Structural Equation Model (SEM) was carried out using the PLS approach with the support of the SmartPLS2 software. The SEM process is divided into two parts: the measurement model and the structural model. To verify the validity of the measurement model, convergent validity, reliability, and discriminant validity were evaluated (Hair Jr. et al., 2016).

To verify convergent validity, the Average Variance Extracted (AVE) criterion was used (Fornell & Larcker, 1981), and the construct reaches validity when this indicator is more significant than 0.50 (Henseler et al., 2009). To measure reliability, Cronbach's Alpha (CA) and Composite Reliability (CC) (Chin, 1998) were used, which must be greater than 0.70 to indicate the reliability of the construct (Tenenhaus et al., 2005), and in exploratory research values above 0.60 are also accepted (Hair Jr. et al., 2009). Discriminant validity is guaranteed when the AVE of a construct is greater than the shared variance of that construct with the others (Fornell & Larcker, 1981). To verify the dimensionality of the constructs, the Parallel Lines criterion was used (Hoyle & Duvall, 2004), which returns the number of dimensions of the construct.

The Bootstrap method was used to calculate confidence intervals for the weights of the measurement model and the coefficients of the structural model. This procedure provides information about the variability of the estimated parameters, which is important for validating the results. The Bootstrap method is widely used to make inferences when the probability distribution of the variable of interest is unknown.

To evaluate the quality of the adjustments, R^2 and GoF were used (Tenenhaus et al., 2005). R^2 represents a scale from 0% to 100%, demonstrating how much the independent constructs explain the dependent ones, and, in general, values lower than 25% represent weak explanatory capacity, values between 25% and 50% indicate moderate explanatory capacity and values above 50% demonstrate substantial explanatory capacity (Hair Jr. et al., 2009). The GoF is a geometric mean of the AVEs of the constructs and the R^2 of the model and varies from 0% to 100%. The GoF in PLS cannot discriminate between valid and invalid models, in addition to not applying to models with formative constructs (Henseler et al., 2009), allowing only a synthesis of the AVEs and R^2 of the model in a single statistic, which may be helpful for future comparisons of adherence of different samples to the model.

RESULTS

Regarding outliers, no values were found outside the scale range of their respective variable, not revealing the type of outlier related to the error in data tabulation. Thus, two observations were found that were considered univariable outliers: observations that were standardized and outside the range of 4.00. About multivariate outliers, nine (0.02%) observations were identified, as they had a significance of the Mahalanobis D^2 measure below 0.001. As it is believed that the observations are valid cases of the population and that, if they were eliminated, they could limit the generality of the multivariate analysis, despite possibly improving its results (Hair Jr. et al., 2009), it was decided not to exclude none of the cases.

Regarding linearity, 759 out of 903 significant relationships were observed at the 5% level, which represents approximately 84.05% of possible correlations, according to the Pearson correlation matrix. Furthermore, using the Bartlett test, p-values lower than 0.05 were observed in all constructs, identifying significant linearity within the constructs (Hair Jr. et al., 2009).

Table 2 presents the sample constituted in this research. 61.21% of individuals are male, 44.74% have completed higher education, and 69.67% have held their current position for less than five years. Individuals in the organization have held their current position for less than five years, representing 80.48%, and 78.08% are allocated to large companies.

Table 2
Descriptive analysis of characterization variables

Variables	Category	n.	%
Gender	Female	128	38.79%
	Male	202	61.21%
Academic education	Elementary school	0	0.00%
	High school	37	11.11%
	Graduation	149	44.74%
	Postgraduate	105	31.53%
	Master's degree	29	8.71%
	Doctorate degree	13	3.90%

(continues)

Table 2 (conclusion)*Descriptive analysis of characterization variables*

Variables	Category	n.	%
Time in current position	Up to 5 years	232	69.67%
	From 5 to less than 10 years old	61	18.32%
	From 10 to less than 15 years old	16	4.80%
	From 15 to less than 20 years old	11	3.30%
	From 20 to under 25 years old	7	2.10%
	Over 25 years	6	1.80%
Time in current organization	Up to 5 years	268	80.48%
	From 5 to less than 10 years old	34	10.21%
	From 10 to less than 15 years old	17	5.11%
	From 15 to less than 20 years old	9	2.70%
	From 20 to under 25 years old	2	0.60%
	Over 25 years	3	0.90%
Organization size	Small	42	12.61%
	Medium	31	9.31%
	Large	260	78.08%

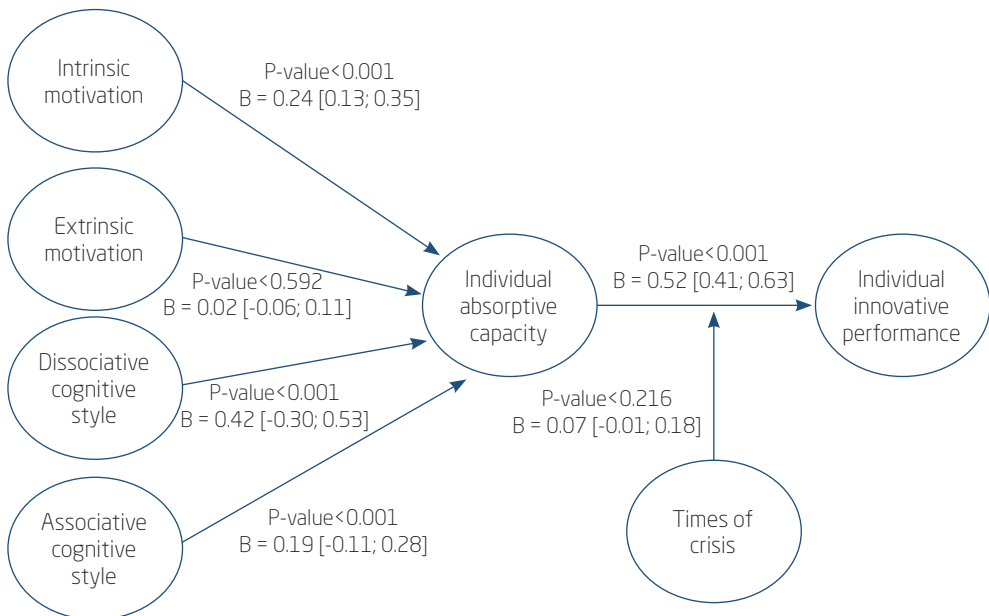
In the measurement model analysis, based on CFA indicators, the constructs' convergent validity, discriminant validity, and reliability were verified. Only one item presented a factor loading lower than 0.50, namely Q43 ("I am doing this job for the salary") of the extrinsic motivation variable. Therefore, this item was removed from the analysis because it did not contribute significantly to forming the latent variable, and it undermines the scope of the basic assumptions that constitute the validity and quality of the indicator representing the concept of interests. Furthermore, analyzing the final model, all remaining items presented a factorial load greater than 0.50.

Table 2 presents the analyses carried out on the measurement model's constructs. Thus, all constructs' CA indices were satisfactory, with the lowest being 0.74 for extrinsic motivation. For CC, the numbers were more significant than 0.60. Convergent validation was adequate for all constructs, as AVEs were more significant than 0.50. Furthermore, the discriminant validity analysis was satisfactory in all constructs since the maximum shared variance (MCV) of each one was lower than the respective AVE.

Table 3**Validation of the construct measurement model**

Construct	CA	CC	AVE	VCM
Associative cognitive style	0.82	0.88	0.64	0.21
Dissociative cognitive style	0.84	0.88	0.56	0.38
Intrinsic motivation	0.90	0.93	0.83	0.23
Extrinsic motivation	0.74	0.89	0.58	0.11
Individual CA	0.92	0.94	0.51	0.38
Times of crisis (moderator)	0.99	0.99	0.57	0.38
Individual innovative performance	0.90	0.92	0.58	0.32

After examining the measurement model, we analyzed the structural model and tested the relationships between the model's variables proposed in Figure 1. In this sense, the tests were carried out based on the path coefficient and analysis of the IC (Interval of Trust), applying bootstrapping analysis with 5,000 subsamples. Figure 2 presents the results obtained.

Figure 2**Structural model**

Note. GoF = 47.84%.

Table 4 presents the structural model with the respective analyses and hypothesis tests. It highlights the occurrence of a significant ($p < 0.001$) and positive ($\beta = 0.24$ [0.13; 0.35]) influence of intrinsic motivation on individual AC, so the more significant the intrinsic motivation, the greater it tends to be the individual CA in times of crisis. Therefore, H1a was accepted. The relationship was insignificant for extrinsic motivation on individual AC ($p < 0.592$). Therefore, H1b was not supported. The level of extrinsic motivation had no effect when analyzed concerning the level of individual AC in times of crisis.

Table 4
Structural model hypothesis test

	Hypothesis	β	CI - 95%	E.P. (β)	P-value	R ²	Results
H1a	Intrinsic motivation → Individual CA	0.24	[0.13; 0.35]	0.05	< 0.001	47%	Accepted
H1b	Extrinsic motivation → Individual CA	0.02	[-0.06; 0.11]	0.04	0.592	47%	Not accepted
H2a	Dissociative cognitive style → Individual CA	0.42	[0.30; 0.53]	0.05	< 0.001	47%	Accepted
H2b	Associative cognitive style → Individual CA	0.19	[0.11; 0.28]	0.05	< 0.001	47%	Accepted
H3	Individual CA → Individual innovative performance	0.52	[0.41; 0.63]	0.06	< 0.001	32%	Accepted
H4	CA individual → Times of crisis → Individual innovative performance	0.07	[-0.01; 0.18]	0.06	0.216	32%	Not accepted

Still, on the tests presented in Table 4, there was a significant ($p < 0.001$) and positive ($\beta = 0.42$ [0.30; 0.53]) influence of the dissociative cognitive style on individual AC; therefore, the greater the dissociative cognitive style, the greater the individual AC tends to be. Therefore, H2a was accepted. Regarding the associative cognitive style on individual absorptive capacity, a significant ($p < 0.001$) and positive ($\beta = 0.19$ [0.11; 0.28]) influence is also noted, meaning that the greater the style associative cognitive, the greater the individual AC tends to be. Therefore, H2b was accepted.

The analysis of the relationship between individual AC and individual innovative performance reveals a significant ($p < 0.001$) and positive ($\beta = 0.52$ [0.41; 0.63]) influence of one on the other and, thus, how much the more significant individual AC, the greater the individual innovative performance tends to be. Therefore, H3 was accepted. Next, the moderating effect

of times of crisis on the relationship between individual AC and individual innovative performance was tested. However, this relationship was neither significant ($p < 0.216$) nor valid since it includes the zero value in the CI ($\beta = 0.07 [-0.01; 0.18]$). Therefore, H4 was not accepted.

DISCUSSION

The findings demonstrated a positive quality of anticipation of intrinsic motivation, dissociative cognitive style, and associative cognitive style concerning individual AC in times of crisis. Specifically, the dissociative cognitive style was the most significant predictor of individual AC in times of crisis. It was also found that the level of extrinsic motivation had no valid effect when analyzed about the level of individual AC in times of crisis. This situation can be explained by the Self-Determination Theory (Ryan & Deci, 2000) as extrinsically motivated people have a strong expectation for immediate rewards and/or concrete results, while intrinsic motivation associates the fulfillment of tasks with the individual's well-being.

Tian and Soo (2018) noted that professionals' commitment drives individual AC. In this sense, we can infer that intrinsic motivation generates greater commitment in crises, positively influencing individual AC. Therefore, intrinsic motivation is a better impetus for individual action when tasks require creativity and involve a large amount of risk and uncertainty, as described in the context of the COVID-19 pandemic, described in the first pages of this text. Furthermore, absorbing new knowledge requires creativity and cognitive flexibility (Agostineto et al., 2022), often associated with intrinsic rather than extrinsic motivation (Ryan & Deci, 2000). From this perspective, our findings align with the central principles of the Self-Determination Theory described by Chiu et al. (2023). However, they demonstrate a different relationship when extrinsic motivational factors are analyzed, especially in times of crisis.

The reason for considering the dissociative cognitive style as the most significant predictor of individual AC in times of crisis in the present study can be attributed to the assumptions of AC itself, according to which new knowledge must combine with existing knowledge to generate new ideas and solutions (Zahra & George, 2002; Enkel & Heil, 2014; West & Bogers, 2017). This creative process is enhanced by a dissociative cognitive style in times of crisis (Todorova & Durisin, 2007; Zahra & George, 2002). This situation has already been indirectly pointed out by Martins and Freire (2023) when the authors point out the AC of startups as a survival factor

during the COVID-19 pandemic. Furthermore, it is known that individuals with dissociative cognition seek differences and unknown solutions in situations of uncertainty (Gagné & Deci, 2005) and, consequently, the dissociative cognitive style is enhanced in periods such as the COVID-19 pandemic, as new working methods need to be incorporated quickly, which requires openness to changes and unlearning (Reinholt et al., 2011).

Finally, the findings showed a positive relationship between the consequences of individual AC and individual innovative performance. However, it was seen that the crisis context did not exert a moderating effect on this relationship. The impact of crises on individuals' behavior can be explained by feelings of fear, anxiety, sadness, and uncertainty, together with symptoms of post-traumatic stress and depression (Cincera et al., 2012). These symptoms are cumulative behavioral consequences that can alter innovative performance in the medium and long term (Roper & Turner, 2020; Scudellari, 2020). Therefore, this moderation, shown here as invalid, needs to be more appropriately studied due to complex individual behavior in times of crisis.

It is worth noting that such findings expand the literature on AC micro foundations (Volberda et al., 2010; Jiménez-Castillo & Sánchez Pérez, 2013; Dahlander et al., 2016; Ter Wal et al., 2017), which often does not consider the different forms of motivation, as well as the different cognitive styles and their possible effects on individual action and behavior (Wang et al., 2015). Therefore, understanding the distinction between intrinsic and extrinsic motivation and dissociative and associative cognitive styles is relevant to identifying the right incentives to stimulate development at the individual level and the gains in competence at the collective and organizational levels, especially in times of crisis, the focus of this study.

CONCLUSIONS

This article contributes to the emerging debates on the micro-foundations of dynamic capabilities related to individual AC, especially characterizing advances regarding the role of motivational and cognitive factors as an antecedent of individual AC in times of crisis. Furthermore, the article also contributes to understanding individual AC as a factor that influences individual innovative performance in times of crisis, covering situations of high uncertainty and ambiguity.

Another important result was the finding that, in critical periods, institutional and structural support related to extrinsic factors is insufficient



to guarantee innovation capacity. Therefore, policymakers, managers, and entrepreneurs must invest in training and qualification programs addressing the development of behavioral, innovative, and knowledge absorption practices and skills, especially valuing job satisfaction behaviors and intrinsic motivations.

Regarding the limitations of this research, the data collection was restricted to Brazil, and the use of cross-sectional data to analyze a complex crisis context stands out—an environment that would be better suited to longitudinal studies. The lack of measurement of the effect of the individual's organizational position on individual AC and innovative performance also represented a limitation. Indeed, this limitation represents a relevant opportunity for future research.

Still, in relation to future work, it is understood that longitudinal and process studies can expand and deepen the concept of individual AC and its antecedents and results. In the same sense, expanding data collection to other cultures would enable more comprehensive results. Finally, the exploration of complex interrelationships between individual and organizational level factors would also be opportunities for future studies, such as, for example, an investigation into the impacts of people management practices and incentive policies as a stimulus for company growth from individual AC and individual innovative performance from company employees.

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