Individual-level absorptive capacity: Unveiling the interplay between dispositions and work context

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A B S T R A C T
While extant literature conceptually recognizes individuals as an integral part of the process with which organizations absorb new knowledge, past research has paid limited attention to the antecedents of individual-level absorptive capacity. In this paper, we address this research gap. We build on the interactionist perspective and propose that individual-level absorptive capacity is shaped by the joint effects of individual employees’ dispositions (i.e., need for cognition and proactive personality) and their work context (i.e., time pressure and autonomy). Significantly, we also recognize the multidimensional nature of absorptive capacity, which suggests that individuals need different capabilities to learn and utilize new knowledge in their organizations. We test our predictions using a unique dataset from 646 employees working on knowledge-intensive tasks. Our results show that the joint effects of dispositional and contextual antecedents are not uniform across different dimensions of individual-level absorptive capacity.

1. Introduction

Since the pioneering work of Cohen and Levinthal (1990), the concept of absorptive capacity has been at the forefront of innovation studies. Originally defined as “the ability of a firm to recognize the value of new, external information, assimilate it, and apply it to commercial advantage” (Cohen and Levinthal, 1990:128), absorptive capacity has been identified as an essential factor that could explain why and how some firms could be more innovative than others in a given competitive environment. Consequently, scholarly interest in absorptive capacity’s antecedents and consequences has maintained momentum (Bedford et al., 2022; Chung et al., 2022; Hurmelinna-Laukkanen and Olander, 2014; Papazoglou and Spanos, 2021; Patterson and Ambrosini, 2015; Santoro et al., 2020; Xia and Roper, 2008). Notwithstanding key nuances in conceptualization and operationalization, studies in this vibrant literature have predominantly considered absorptive capacity as a firm-level construct that is assumed to manifest itself through various organizational phenomena (i.e., routines, capabilities, procedures).

However, treating absorptive capacity as a firm-level capability obscures sufficient understanding of individuals’ crucial role in absorbing new knowledge. This is an important oversight considering that individuals possess different characteristics, such as personal dispositions and cognitive capacities, that matter for organizational-level outcomes (Felin et al., 2012; Powell et al., 2011) and the development of organizational capabilities and routines (Argote and Ingram, 2000; Barney and Felin, 2013; Felin and Hesterly, 2007; Zahra et al., 2020). The centrality of individuals for absorptive capacity has been acknowledged since the concept was first introduced by Cohen and Levinthal (1990). Specifically, they emphasized that “an organization’s absorptive capacity will depend on the absorptive capacities of its individual members” (Cohen and Levinthal, 1990: 131). Foss (2007) makes a similar observation by suggesting that an understanding of knowledge-related phenomena (e.g., absorptive capacity) “cannot be reached in lieu of a starting point in individuals” (p. 43, emphasis added). Subsequent conceptual studies and reviews have similarly identified individuals as the proper starting point to understand the development of absorptive capacity and its role in organizational learning and innovation (Lane, Koka & Pathak, 2006; Lewin, Massini & Peeters, 2011; Martinkenaite and Breunig, 2016; Ter Wal, Criscuolo & Slater, 2017; Volberda, Foss & Lyles, 2010; Weidner et al., 2022; Zahra and George, 2002).

In this paper, we build on and extend the burgeoning body of...
research that examines absorptive capacity at the individual level. Studies in this stream have provided valuable insights about the nature of individual-level activities involved the absorption of external knowledge (Sjödin, Frishhammer & Thorgren, 2019), the process by which individuals’ absorptive capacities unfold (Martinkenaite and Breunig, 2016; Matusik and Heeley, 2005) and the effect of individual-level absorptive capacity on different outcomes such as knowledge creation (Matusik and Heeley, 2005), task productivity (Deng, Doll & Cao, 2008), innovation (Enkel et al., 2017; Schweisfurth and Raasch, 2018). Although some studies looked at the role of organizational mechanisms and levers on the development of individual-level absorptive capacity (Jimenez-Castillo and Sanchez-Perez, 2013), there is limited research on the individual-level antecedents and sources of variation (see (Lowik et al., 2017); Praatoom, 2022; Snehvrat, Chaudhary & Majhi, 2022; Yildiz et al., 2021). Some of these studies did not pay due attention to the multidimensional nature of individual-level absorptive capacity, which causes oversight of different capabilities and patterns of actions that might be required across different phases of the learning process (c.f., Perry-Smith and Mannucci, 2017; Zahra and George, 2002; Zobel, 2017), some others have considered absorptive capacity as an exogenous variable and not delved into micro-level sources of variation and heterogeneity.

Based on the above, we address the lack of research on (1) personal and situational factors that could affect the development of individual-level absorptive capacity, and (2) the multidimensional nature of absorptive capacity at the individual level. Specifically, we will study two key dispositional antecedents of individuals’ absorptive capacity that have, thus far, not been considered in earlier research—namely, the need for cognition (i.e., individuals’ dispositional tendency to engage in and enjoy thinking) and proactive personality (i.e., individuals’ disposition toward engaging in active role orientation and taking action to influence their environment). We claim that the strength of these dispositions in an individual would affect the extent to which s/he engages in actions and activities related to absorbing new knowledge from sources outside the firm boundaries.¹ In reaching our decision to give prominence to these two factors, we drew inspiration from different yet complementary streams of research that have reported significant effects of these factors on individual-level creativity, entrepreneurial behavior, and innovation (e.g., Fuller and Marler, 2009; Kim et al., 2010; Pan et al., 2020; Wu et al., 2014). In the present investigation, we will examine how these antecedents relate to distinct dimensions of absorptive capacity at the individual level.

We further propose that the effect of individual attributes on absorptive capacity depends on the perceived characteristics of the work context. This is because individuals’ dispositions can be expressed through observable patterns of behavior, provided their work environment allows it. To that end, we build on the interactionist perspective, one of the most ubiquitously used frameworks in past creativity and innovation studies (Anderson et al., 2014; Woodman et al., 1993; Zhou and Hoever, 2014). Predicated on the idea that human behavior “is a function of a continuous multidirectional process of person-by-situation interactions” (Endler, 1983: 160), the interactionist perspective emphasizes that individual-level phenomena can be best understood by taking the joint effects of individual and contextual factors into consideration (Shalley et al., 2009; Yuan and Woodman, 2010). As observed by Wu et al. (2014), despite considerable attention paid to dispositional and contextual antecedents of individual innovation behavior, “issuing effects have been relatively little about how dispositional and contextual aspects might work together” (p.1512).

Motivated by the aforementioned, we hypothesize that the potential effects of the need for cognition and proactive personality on absorptive capacity would be moderated by the degree to which individual employees work under time pressure and are granted decision-making autonomy. As Hornung and Rousseau (2007: 403) noted, “autonomy on the job is perhaps the central work characteristic in shaping worker attitudes, motivation, and behavior.” Similarly, in work environments where creativity and innovation matter considerably, perceived time constraints have long been recognized as a crucial factor (e.g., Baer and Oldham, 2006; Chong et al., 2010; Hsu and Fan, 2010; Sijbom et al., 2018). In focusing on these two contextual factors, we follow a parallel line of reasoning to Wu et al. (2014) and offer a fine-grained analysis by studying the dispositional and contextual antecedents of absorptive capacity dimensions at the individual level.

The empirical results corroborated our predictions and showed that the effect of individual-level traits on absorptive capacity depends on the work context. More importantly, we found that individual characteristics and work context can sometimes have opposing effects on various dimensions of absorptive capacity. In particular, a higher level of job autonomy was found to be conducive to developing the absorptive capacity, especially of individuals with proactive personalities. Furthermore, exerting higher time pressure on proactive individuals diminished their capacity to identify potentially useful ideas while increasing their capacity to understand and exploit new knowledge. Although individuals with a strong need for cognition were less sensitive to these situational factors, we have observed the positive and negative effects of autonomy and time pressure on the specific dimensions of their absorptive capacity. Understanding these tradeoffs is quite important since sequential phases of the learning process—wherein some dimensions of absorptive capacity are more relevant than others—require assigning individuals with relevant traits and creating a suitable work environment. In the conclusion section, we discuss these findings’ theoretical and practical implications.

1.1. Theoretical background

Although Cohen and Levinthal (1990) explicitly claimed that a firm’s absorptive capacity has both individual and organizational antecedents, empirical research has been mostly conducted at the collective level, such as country, inter-, and intra-organizational levels of analysis (e.g., Lane et al., 2006; Volberda et al., 2010). A growing body of research emphasizes the necessity for a better understanding of absorptive capacity’s microfoundations to address its multilevel nature (Foss, 2011; Lane et al., 2006; Lewin et al., 2011; Minbaeva et al., 2014; Volberda et al., 2010). Volberda et al. (2010, p. 944) claimed that “the understanding of AC as a dependent variable, absent of a consideration of the level of individuals and their action, may be inherently incomplete.” This point is built on the idea that a firm’s absorptive capacity “depends on the individual absorptive capacities of the organization’s members” (Lane et al., 2006, p. 838).

Following the train of thought mentioned above, several papers examined absorptive capacity at the individual level. Conceptualizing absorptive capacity as individuals’ knowledge bases (i.e., understanding of work processes and technologies) and reasoning mechanisms (i.e., ability to solve complex problems using established methods), Deng et al. (2008) showed that individuals’ task productivity and extent of IT use for problem-solving are positively associated with their absorptive capacity. Schweisfurth and Raasch (2018) introduced a conceptual nuance by considering a domain-specific absorptive capacity (i.e., the ability to absorb knowledge about customer needs and solutions) and reported that it significantly predicts individuals’ innovativeness. Park et al. (2007) developed a model that examines multiple dimensions of absorptive capacity (i.e., understanding, assimilating and applying new knowledge) and incorporates situational elements (i.e., degree of organizational support). Using data collected from 245 users of 20 Korean companies that implemented ERP technologies, they found that individuals’ capacity to assimilate and apply ERP systems increases their performance of ERP usage. In contrast, no moderating role of

¹ We would like to thank one of the anonymous reviewers for encouraging us to be clear and precise about the firm boundaries and sources of new knowledge.
organizational support was detected. Enkel et al. (2017) similarly recognized the multidimensional nature of absorptive capacity. They developed a model where individual efforts to identify, assimilate and utilize external knowledge have varying effects on exploratory and exploitative innovation. Their results suggest that individuals’ ability to identify new external knowledge has a significant and positive effect on both types of innovation. Except for the positive effect of assimilation on exploratory innovation, other dimensions of individual-level absorptive capacity did not significantly affect innovation outcomes.

In one of the rare studies that endogenized individual-level absorptive capacity, Lowik et al. (2017) have shown that employees’ prior knowledge diversity, external network diversity and biosociative cognitive style positively affect their absorptive capacity, which in turn fosters their innovation performance. More recently, a series of studies (Pratoom, 2021; Snellvat et al., 2022; Yildiz et al., 2021) investigated individuals’ goal orientation as an important source of variation in their absorptive capacity. All these studies found strong empirical support for the conjecture that strong goal orientation is positively associated with individuals’ ability to explore, understand and utilize new knowledge.

With the ambition to scrutinize cross-level dynamics, several studies have looked at the relationship between an organization’s absorptive capacity and a variety of individual-level traits or behaviors, such as organizational citizenship behavior (Hart et al., 2016), individual learning orientation and behavior (Martinkenaite and Breunig, 2016; Yao and Chang, 2017), social interaction (Hotho et al., 2012; Tortoriello, 2015), and leadership (Flatten et al., 2015). Although the central role of individuals in developing firm-level absorptive capacity has been repeatedly emphasized (Cohen and Levinthal, 1990; Jansen et al., 2005; Volberda et al., 2010; Zahra and George, 2002), the field has only recently started to delve into the individual-level antecedents of absorptive capacity (Hart et al., 2016).

In one of the earlier contributions to the literature, Matusik and Heeley (2005) acknowledged that absorptive capacity comprises both collective and individual dimensions and emphasized the importance of distinguishing between them. They found empirical support for the hypothesis that individuals’ technical expertise, shared communication styles, and common goals positively affect a firm’s ability to develop new knowledge. Zhao and Anand (2009) have similarly examined the link between individual-level and firm-level absorptive capacity. They claimed that, although prior knowledge and experience constitute individual-level ability to acquire and develop new knowledge, the structural and cultural aspects of the organization foster the collaboration and coordination required to develop and expand the stock of collective knowledge. In their integrative review of extant organizational learning and absorptive capacity literatures, Sun and Anderson (2010) develop a conceptual model where individual-level absorptive capacity plays a central role by providing expert and entrepreneurial intuition required to acquire new knowledge. According to this framework, the locus of absorptive capacity moves up to group and organizational levels during the subsequent learning processes (i.e., interpretation, integration and institutionalization) and new knowledge absorption (i.e., assimilation, transformation and exploitation). Martinkenaite and Breunig (2016) also developed a multi-level conceptual framework by drawing on the knowledge-based view of the firm and the micro-foundations perspective of organizational capabilities. In particular, they focus on how individuals’ motivation and ability lead to different types of learning behavior (i.e., exploratory, transformative, exploitative), which, in turn, results in the emergence of organizational absorptive capacity to recognize, assimilate and apply new knowledge. Also adopting the micro-foundations perspective, Díaz (2019) developed and tested a multi-level model of absorptive capacity, wherein they hypothesized and empirically verified that individual knowledge workers’ perspective-taking and creative behavior constitute the micro-level antecedents of organizational absorptive capacity.

We expand upon existing research to enhance our knowledge of the mechanisms involved in developing absorptive capacity at the individual level (e.g., Flatten et al., 2015; Soo et al., 2017). Past research has mostly considered individual-level absorptive capacity as a ‘given’ and rarely problematized the factors that could drive its development. We contend that, to understand the microfoundations of firm-level absorptive capacity thoroughly, it is first important to examine both the personal and contextual antecedents of individual-level absorptive capacity. As eloquently put by Felin et al. (2015: 588), “a basic understanding of micro elements that constitute wholes can then, in turn, lead to more rigorous work at the macro level as well.” In this regard, we would like to clarify that our micro-level focus does not mean we shall examine individual-level absorptive capacity in a social vacuum. People are not atomistic entities; rather they function as interconnected social actors within organizations. Their actions unfold within a shared context, such as common strategy, organizational objectives, and cultural norms, among others. Thus, individuals’ behavioral patterns and activities toward new knowledge absorption should be conceptualized and scrutinized in conjunction with this collective framework. Indeed, as we showed above, past research has emphasized the key role of collaboration and cohesion in linking individual and collective absorptive capacities (Matusik and Heeley, 2005; Zhao and Anand, 2009). In essence, we look at individuals’ capacity to source and obtain knowledge from sources outside the organizational boundaries. Thus, it is an individual-level capacity to learn and acquire new knowledge; however, the kind or nature of this newly garnered knowledge is contingent upon and guided by organizational objectives and strategies. In other words, organizational objectives and strategies specify the particular elements and features of novel knowledge to be aimed at, while individual-level absorptive capability delineates how much knowledge workers can effectively assimilate this specified/targeted knowledge.

In this study, we adopt the three dimensions of absorptive capacity as conceptualized by Cohen and Levinthal (1990). These components include identifying valuable new knowledge, assimilation of this new knowledge, and subsequent exploitation towards commercial ends. This conceptual foundation holds significance as these dimensions relate to the actions and practices through which individuals absorb new knowledge in their routine work. These three dimensions have also been used in earlier empirical research on individual-level absorptive capacity (Enkel et al., 2017; Park et al., 2007; Sjödin et al., 2019; Ter Wal et al., 2017; Yildiz et al., 2021). Identification refers to individuals’ capacity to recognize and obtain potentially useful knowledge that resides outside the firm’s boundaries. To achieve this, individuals need the necessary skills and capabilities to scan their environment, pick out potentially useful knowledge, and establish links and relationships with relevant actors (e.g., suppliers, customers, colleagues, partners, universities etc.) and source this knowledge effectively and efficiently. Assimilation denotes how individuals can analyze, interpret and understand newly acquired knowledge. Individuals with a high capacity for assimilation have the ability and means to both comprehend the intricacies of new knowledge and adjust (or discard, if needed) their existing knowledge routines to arrive at a new and better solution. Lastly, exploitation reflects how individuals can apply new knowledge by incorporating it into their routine operations and tasks. Exploitation capacity typically manifests itself by creating new ideas, processes, products and other innovations.

In the next section, we develop and introduce our theoretical predictions regarding the relationship between individuals’ dispositional attributes, work context and absorptive capacity. To that end, we adopt a social approach to better understand how dispositional and contextual antecedents jointly shape individuals’ innovation behavior (Amabile et al., 1996; Shalley et al., 2004; Woodman et al., 1993). In other words, the interactionist perspective suggests that an individual’s absorptive capacity, as manifested by specific patterns of behavior and routines when dealing with new knowledge, can be more fully captured by examining the interaction between the strength of an individual’s dispositions and the extent to which situational factors characterizing his/her work context activates and facilitates the
behavioral manifestation of these dispositions.

We shall clarify that, within the organizational setting, “new knowledge” refers to fresh and externally obtained information that is considered valuable to the organization and aligned with its goals. This differs from an individual’s personal acquisition of new knowledge for self-improvement. Thus, we focus on individuals’ ability to recognize, understand, and efficiently utilize external knowledge to enhance the organization’s pool of knowledge. In other words, we recognize individuals within their organizational goals and highlight their pivotal function as ‘knowledge agents’ who actively engage in sourcing, interpreting, and integrating external information deemed valuable to the organization’s objectives. This way, we aim to shed light on the microfoundations of organizational learning, emphasizing individuals’ role in acquiring and applying new knowledge within organizations.

2. Hypothesis development

2.1. Dispositional attributes and absorptive capacity

The need for cognition refers to the “tendency for an individual to engage in and enjoy thinking” (Cacioppo and Petty, 1982:116). There are several mechanisms through which a strong need for cognition manifests itself in enhanced individual absorptive capacity. To begin with, people with a high need for cognition enjoy situations where they face novelty, seek new knowledge, and develop original solutions based on this novel knowledge. As noted by Cacioppo et al. (1996), those who are high in need for cognition are more likely to “reach and draw out information from their environment” (p.245). If activated, the need for cognition prompts curiosity and willingness to scan and find new information and opportunities available in the environment. Thus, the need for cognition strengthens an individual’s curiosity and willingness to pursue fresh insights and ideas pertinent to his/her work-related tasks. It has been further shown that the need for cognition is essential when solving complex problems, which require the ability to combine new knowledge with an existing knowledge base (Berzonsky and Sullivan, 1993; Sansone and Harackiewicz, 2000). This can diminish the sense of personal satisfaction and intrinsic interest that typically fuels their motivation to explore and learn new knowledge. Furthermore, individuals with a strong need for cognition are more likely to value autonomy and the freedom to explore ideas and concepts in their own way (Wu et al., 2014; Froiland and Worrell, 2016). Extrinsic rewards may create a sense of obligation or pressure to perform, dampening the individuals’ natural curiosity and enthusiasm. Moreover, individuals with a strong need for cognition often derive a sense of accomplishment and self-worth from understanding and learning, rather than from external validation. They find joy in the mental effort required to grasp complex concepts and engage in critical thinking. Extrinsic rewards, which focus on the outcome rather than the process, may provide a different sense of personal fulfillment and intellectual growth than these individuals seek.

In summary, people with a strong need for cognition might be less motivated to perform work tasks with extrinsic goals (e.g., exploitation of new knowledge) due to the potential distraction from intrinsic enjoyment, the imposition on their autonomy, and the potential compromise of personal fulfillment. Their intrinsic motivation is derived from the cognitive challenges and the satisfaction of intellectual exploration, making them less responsive to extrinsic rewards. These individuals thrive on the inherent joy of learning and understanding, and their motivation comes from within, rather than from extrinsic incentives. Based on this, we do not make any formal prediction and develop a hypothesis concerning the effect of the need for cognition on the capacity to exploit new knowledge.

Proactive personality refers to the extent to which people are future-focused, change-oriented, self-initiated, and tend to influence their environment (Bateman and Crant, 1993; Parker, Williams & Turner, 2006). To that end, proactive individuals are willing to take the initiative and actively seek novel ideas directly applicable to their job functions and in accord with the organizational goals. However, when the measurable outcomes of learning are less predictable, clear, and certain, these individuals may experience reduced motivation to engage in exploratory learning endeavors (Fuller et al., 2010; Thompson, 2005). Given that identification of new work-related knowledge entails unpredictability and uncertainty, activating individuals’ proactive personalities might not significantly affect their identification capabilities. This can be attributed to several factors. Firstly, individuals with proactive personalities often thrive in environments characterized by clear goals and well-defined expectations. They are typically driven by the prospect of achieving measurable outcomes and tangible results (Fuller and Marler, 2009; Joo and Ready, 2012). When faced with an exploratory learning situation where the outcomes are uncertain or difficult to quantify, these individuals may perceive a lack of structure and direction, leading to decreased motivation. The absence of specific benchmarks or metrics for success may leave them unsure of their progress and less inclined to invest their time and effort in such endeavors. Secondly, individuals with proactive personalities tend to be goal-oriented and future-focused (Tolentino et al., 2014). They often engage in strategic planning and prefer to invest their energy in activities that offer a high probability of yielding desired outcomes. Since learning outcomes are uncertain in the exploratory learning process, individuals with proactive personalities may perceive the potential risks and costs of the process to outweigh the potential benefits (Crant & Jiang, 2016). This may lead to a decrease in their motivation to engage in new learning endeavors.

In conclusion, a proactive personality – when activated – will not induce individuals to exert efforts to engage in exploratory learning and identify new knowledge, where the measurable outcomes of learning are less predictable, clear, and certain. The preference for clear goals and the focus on measurable results contribute to this decreased motivation.
Hence, we do not propose a formal hypothesis regarding the impact of proactive personality on individuals’ capacity to identify new knowledge that is aligned with the needs and goals of their organization.

Whereas identifying new knowledge can be considered an excursion into the unknown, assimilation of an already identified knowledge is a more targeted learning endeavor. Therefore, actions surrounding assimilation entail less uncertainty and unpredictability. Proactive individuals also have a high learning orientation because of their strong aspiration to anticipate and shape the future (Major, Turner & Fletcher, 2006). Learning orientation is important for staying up-to-date and acquiring knowledge and expertise in technical domains relevant to one’s expertise, role and responsibilities within the organization. Secondly, individuals with a strong proactive personality tend to possess strong organizational and self-regulation skills (Grant, Hu & Jiang, 2016). They excel at setting goals, planning learning activities, and maintaining focus and discipline. These skills enable them to effectively assimilate new work-related knowledge by creating a structured framework for learning. They leverage their existing knowledge as a foundation, identifying connections and patterns that allow for the seamless integration of new information with the existing knowledge repertoire of the organization. Their ability to organize and categorize knowledge facilitates assimilation and enhances their understanding of complex concepts. It is, thereby, easier for proactive individuals to integrate new and existing knowledge and develop creative solutions aligned with the organizational goals.

Considered from the other end of the continuum, being less proactive has significant downsides when absorbing new work-related knowledge (Parker et al., 2006). Reactive individuals exhibit distinct cognitive and behavioral characteristics that set them apart from their proactive counterparts, rendering them less effective in assimilating and exploiting new knowledge from external sources. Generally, they lean towards a more compliant and reactive position, which constrains their ability to engage with external knowledge actively. Their intellectual approach frequently favors habitual or known strategies instead of actively seeking fresh, innovative solutions (Seibert et al., 2001). This behavior subsequently limits their propensity to explore and adopt new concepts or knowledge. Moreover, reactive individuals show a decreased willingness to engage in the learning and adaptation processes necessary for assimilating external knowledge. Their approach towards such knowledge is majorly need-induced, such as meeting immediate obstacles at work, rather than actively seeking novel perspectives (Parker and Sprigg, 1999). This reactive approach can restrict individuals’ ability to fully explore and utilize external knowledge. Moreover, reactive individuals may encounter higher cognitive dissonance when faced with novel or inconsistent data from outsourced sources (Fuller et al., 2012). The discomfort could result in a reluctance to embrace innovative concepts as they might lean towards established routines and practices, posing challenges to the effective absorption and utilization of externally sourced information.

In sum, to better understand and internalize new knowledge, proactive individuals intensively interact with other employees to determine whether and how new knowledge can be framed, adjusted, and promoted in the organization. Gong et al. (2012: 1615) noted that “through exchanges with others, proactive employees accumulate informational resources, improve their knowledge bases, develop new ideas, and refine and test these ideas for resolving problems or tapping into identified opportunities.” Accordingly, we post the following hypothesis.

**Hypothesis 2a.** Proactive personality is positively related to individuals’ capacity to assimilate new knowledge relevant to their work and aligns with their organization’s needs and goals.

Proactive personality is, per definition, about the motivation to respond to, or change one’s environment (Bateman and Crant, 1993). More generally, motivation for change among individual change agents depends on recognizing the need for change and the belief that actual organizational change is possible (Armenakis et al., 1993). Exploiting new knowledge entails intentional idea generation, idea promotion, and idea implementation to benefit performance within a work role, workgroup, or organization with clear commercialization benefits. Given their perseverance (Crant, 2000), individuals with strong proactive personalities may be particularly effective in advertising their ideas and generating wide support, which arguably promotes successful idea realization (Schwaab et al., 2007; Fuller and Marler, 2009). In relation to this, it has been found that individuals with a strong proactive personality exhibit high levels of self-confidence and assertiveness (Li et al., 2017). They believe in their abilities and are not afraid to take initiative or voice their ideas. This self-assurance enables them to champion their newly learned knowledge within the organization, advocating for its value and potential commercial applications. Their confidence and assertiveness make them effective communicators and influencers, allowing them to present their ideas persuasively and convince others regarding the merits of these ideas. Moreover, proactive individuals often possess exceptional networking and interpersonal skills. They excel in building and maintaining relationships, both within their organization and beyond (Thompson, 2005; Vandenberghe and Basak Ok, 2013). These networking abilities enable them to connect with colleagues, experts, and potential collaborators who can contribute to developing and exploiting new knowledge according to the needs and objectives of the organization. Their strong interpersonal skills also facilitate cooperation and collaboration, as they can effectively engage and work with others to leverage the newly learned knowledge for commercial solutions. In sum, proactive people are good at championing their ideas and solutions. They are motivated and able to advocate and promote their newly found solutions to the broader audience, demonstrating their ability to capitalize on new knowledge in attaining organizational goals (Crant, 2000; Major et al., 2006). Therefore, we predict the following.

**Hypothesis 2b.** Proactive personality is positively related to individuals’ capacity to exploit new knowledge relevant to their work and aligns with their organization’s needs and goals.

### 2.2. Moderating role of job autonomy

As noted before, the need for cognition and proactive personality are individual dispositions. The extent to which these dispositions are activated and manifested in actual behavior depends on the task environment. Therefore, the relationship between the need for cognition, proactive personality, and absorptive capacity will be affected by organizational context. In particular, we focus on job autonomy and time pressure, two key contextual factors that significantly affect employees’ creative innovation behavior (e.g., Baer and Oldham, 2006; Wu et al., 2014).

Job autonomy can be defined as the discretion granted to employees to create their working schedule, make their own decisions, and have room and space to dictate their work. When given autonomy, individuals feel stronger responsibility at work and demonstrate higher psychological ownership of their tasks (Hackman and Oldham, 1976; Parker et al., 1997). This will lead employees to become more cognitively involved in their job responsibilities and engaged in finding solutions to perform their tasks better (Morgeson and Humphrey, 2006). In this manner, high job autonomy provides an ideal work setting for individuals with a strong need for cognition to fulfill their needs. First, formal rules and processes are less strictly applied to those given high job autonomy, enabling individuals with a high need for cognition to pursue their curiosity and engage in actions that require scanning, identification, and apprehension of new ideas and possibilities that could be of value to the organization. In addition, some individuals might find it a motivating challenge to work with the lack of certainty and structuration created in an autonomous job environment (Wu et al., 2014). Second, if given discretion, individuals can benefit from the flexibility required to adjust their existing routines and integrate them
with new work-relevant knowledge (Leach et al., 2003). Third, high job autonomy allows individuals to make decisions and control their work. This will provide latitude and freedom to those who have a strong need for cognition to immerse themselves in their work, which would, in turn, increase their intrinsic motivation. Earlier research on self-determination theory has shown that autonomy is a crucial precondition for maintaining individuals’ intrinsic motivation, which fosters individual creativity and innovation behavior. Autonomy also increases individuals’ perceived control and responsibility. This would, in turn, help individuals with a high need for cognition to persevere and keep on working on innovative ideas even if concrete results could not be materialized immediately. Lastly, working in an autonomous work environment can lead individuals to believe they can successfully champion their ideas.

To sum up, when working in contexts with high autonomy, individuals with a strong need for cognition can perceive the psychological safety to pursue exploratory learning, and engage in cognitive evaluation and reflection. Considering the critical role psychological safety plays in fostering exploration, innovation and creative behavior among organizational members, we predict that it.

**Hypothesis 3.** The positive relationship between individuals’ need for cognition and their capacity to (a) identify and (b) assimilate new work-relevant knowledge is moderated by job autonomy, such that the relationship is stronger when job autonomy gets higher.

Proactive people frequently take the initiative to develop new knowledge, as we noted before. To achieve this, they can develop inter-organizational networks through sharing knowledge, experiments with new ideas and procedures to generate unique solutions, and then internalize these solutions by connecting with peers and other internal constituents. However, given little job autonomy, their capacity to take such initiatives may be constrained. Highly structured rules and regulations significantly reduce the resource slack required to pursue opportunities to develop creative solutions. Low job autonomy environments include explicit disincentives for proactive individuals to stray from clearly defined behavioral demands and performance goals and formal constraints on their ability to explore fresh ideas and solutions. On the other hand, highly autonomous work settings entail less rigid performance and accomplishment standards, giving proactive people more latitude to shape their surroundings and make decisions with the future in mind.

The positive impact of job autonomy on proactive individuals’ capacity to develop new knowledge is also consistent with trait activation theory, which suggests that personality traits can be expressed to the extent that situational cues support them (Tett et al., 2021). High autonomy work contexts can aptly be characterized by situations with less strict and formalized supervision, task structures, deliverables and temporal pacing. Fuller et al. (2010: 39) argue that “people with proactive personalities are likely to respond to these cues by experimenting with novel ways of performing tasks and implementing changes that enhance performance.” Consequently, individuals might infer that it is a valued work behavior to be more enterprising by understanding and developing new and novel solutions and ideas. In other words, high job autonomy sends organizational signals that activate proactive people and encourage them to express their personality more freely and effectively. Furthermore, like those with a high need for cognition, proactive individuals would also have a stronger intrinsic motivation to voluntarily engage in new knowledge development if given discretion and autonomy in their tasks. Proactive individuals are innately willing to take risks and tackle environmental challenges. However, unless these inherent drives are combined with necessary work autonomy, “their intrinsic motivation for tasks diminishes due to a lack of enthusiasm, ambition for taking risks, and willingness to overcome obstacles, which are essential factors in creative activity” (Chen et al., 2015).

In short, we anticipate that job autonomy provides the right environment for proactive people, allowing them to aim at opportunities to build new and better ways to do their jobs. Consequently, we predict that it.

**H4a.** The positive relationship between individuals’ proactive personality and their capacity to assimilate new work-relevant knowledge is moderated by job autonomy, such that the relationship is stronger when job autonomy increases.

Although individuals with a strong proactive personality would excel in finding and exploiting newly learned knowledge to develop commercial solutions, they may perform worse when provided with high job autonomy. As discussed earlier, proactiveness could be positively related to exploitation capability. Yet, the combination of their proactiveness and high job autonomy can lead to suboptimal outcomes. Several mechanisms might underlie this. First of all, individuals with a strong proactive personality often tend to pursue multiple ideas and initiatives simultaneously (Grant et al., 2016). Earlier research has shown that utilizing new knowledge requires strict planning and control for efficient return on commercial products (Murtagh, 2016). For the exploitation of new knowledge, proactive individuals need a clear direction toward the commercialization of knowledge and give them guidelines for the general organizational goals for the commercialization of the newly acquired knowledge. Therefore, if given the autonomy to do so, proactive individuals’ inherent drive to take the initiative and seize opportunities can lead to an overextension of their efforts. When granted high job autonomy, these individuals may feel empowered to explore various avenues and may struggle to prioritize their efforts effectively. Consequently, their focus may become diffused, hampering their ability to concentrate on developing specific commercial solutions using newly learned knowledge.

In addition, proactive individuals may sometimes find it difficult to align their individual initiatives with organizational goals and objectives (Li et al., 2010; Joo and Ready, 2012). Providing high autonomy will lead proactive people to take their own initiatives, which might not align with the general task and lead to inefficient use of time and resources. High job autonomy can amplify their independent nature, potentially leading to a divergence between their personal interests and the organization’s strategic priorities. As a result, their efforts to exploit newly acquired knowledge may not align with the overall commercial objectives, resulting in inefficiencies and suboptimal utilization of resources. In conclusion, individuals with a strong proactive personality may perform worse in finding and exploiting newly learned knowledge to develop commercial solutions when granted high job autonomy. Their tendency to pursue multiple initiatives and potential misalignment with organizational goals can diminish their ability to focus, prioritize effectively, and deliver commercially viable solutions.

**H4b.** The positive relationship between individuals’ proactive personality and their capacity to exploit new work-relevant knowledge is moderated by job autonomy, such that the relationship is weaker when job autonomy increases.

2 Since we did not formulate any hypothesis about the effect of need for cognition on the exploitation dimension, we did not develop any hypothesis on the moderation effect of job autonomy on the link between the need for cognition and exploitation.

3 Since proactive personality doesn’t have any effect on the identification dimension there is no hypothesis on the moderation effect of job autonomy on the link between proactive personality and identification.

2.3. Moderating role of perceived time pressure

Time pressure refers to the degree to which the organizational members experience increasing their work pace to fulfill their assigned tasks (Baer and Oldham, 2006; Kinicki and Vecchio, 1994). As an
important situational constraint, time pressure would “make it harder or even impossible to pursue a goal or to regulate an action” (Frese and Zapf, 1994: 311). To be more specific, time pressure would limit employees’ ability to translate their skills and motivation into work tasks and, thereby, hinder them from achieving performance targets and goals.

Considering that the need for cognition necessitates high degrees of cognitive effort and psychological investment, individuals with a high need for cognition would require less resource-constrained environment when undertaking tasks requiring creativity and innovativeness. Under such circumstances, individuals, especially those with a high need for cognition, would benefit from different kinds of organizational support for creativity. Such resources and support systems are especially valuable to mitigate the risk of resource exhaustion and depletion. Time is one such essential resource. Those with a high need for cognition need sufficient time to engage in deep thinking and cognitive engagement. However, when organizations levy stricter deadlines and time constraints, employees are less likely to feel that they are receiving the necessary organizational support and instead that creativity is discouraged and respected in their organization. Because of this, it will be much harder to scan the environment, think about possible ideas, work on understanding these ideas, and turn them into commercial solutions. Moreover, time pressure results in lower engagement in exploratory behavior and hampers intrinsic motivation, the two more detectable attributes among individuals with a high need for cognition (Amabile, 2018; Ancona et al., 2001). Accordingly, we hypothesize that 4.

H5. The positive relationship between individuals’ need for cognition and their capacity to (a) identify and (b) assimilate, is moderated by time pressure, such that the relationship is weaker when time pressure gets higher.

Whereas situational constraints created by time pressure might hinder the fulfillment of the need for cognition, they may encourage more vibrant forms of proactive behavior. In particular, time pressure might create a work context wherein individuals must exert additional effort to achieve work-related goals within stricter deadlines. On that account, time pressure can be considered a challenge stressor that would prompt individuals to find and develop new and, presumably, more efficient ways to fulfill their tasks on time (Unsworth and Parker, 2003; Wu and Parker, 2011). Obly and Fritz (2010) contend that conducting proactive behavior is a way for individuals to tackle high job demands. Thus, individuals can interpret perceived time pressure as a signal that their work conditions are inefficient or otherwise suboptimal, which eventually requires a change in routine processes (Fay and Sonnentag, 2002). Consequently, time pressure can bring about more proactive behaviors to counterbalance these challenges. This prediction also aligns with activation theory, which predicts that time pressure stimulates individuals to engage more with their tasks and responsibilities (Gardner and Cummings, 1988). Stronger work engagement induced by increased time pressure is especially important for stimulating work behaviors that deviate from routines and bring innovative ideas. As noted by Baer and Oldham (2006:964) “individuals who are engaged in what they do are not only more curious but also more willing to take risks, such as engaging in exploratory behaviors and experimentation—all of which should facilitate creativity.” Individuals with proactive personalities could particularly be more adept at positively responding to time pressure as a stimulus, considering that they are future-oriented and intrinsically motivated to maintain influence over their environment to achieve their goals (Major, Turner & Fletcher, 2006).

The preceding discussion suggests several processes through which time pressure generates a work environment that facilitates proactive people’s development of their absorptive capacities. The amount of task effort and concentration displayed by proactive people would increase because of higher time pressure. As a result, proactive people are more likely to pay attention to their environment as a source of new ideas, work harder to understand new ideas, and develop the skills necessary to successfully integrate new ideas with existing organizational knowledge when working under time constraints. Furthermore, like other resource constraints, time pressure necessitates better efficiency by abandoning the status quo and searching for fresh solutions and ideas. Third, time constraints operate as a catalyst for more engagement in one’s task, which proactive people are better able to handle. This increased activation level causes proactive people to build stronger and more assured attitudes toward their freshly developed ideas, enabling them to work more effectively and powerfully champion them internally. These arguments lead us to the following hypotheses 5.

H6. The positive relationship between individuals’ proactive personality and their capacity to (a) assimilate, and (b) exploit new knowledge is moderated by time pressure, such that the relationship is stronger when time pressure gets higher.

We schematically present our model in Fig. 1.

3. Methodology

3.1. Empirical context and data collection

Energy Inc., 6 the empirical context of this paper, is a large European multiunit manufacturing company with €1.1 billion in annual sales and over 2400 full-time employees. The company designs and manufactures industrial gas turbines for the energy industry, and its operations are quite comprehensive, encompassing R&D, order engineering, production, site assembly, maintenance, and services. Energy Inc. provides a suitable empirical setting to investigate the antecedents of individual-level absorptive capacity, given that the company operates in a technology-intensive industry where engineers must continuously acquire and apply evolving knowledge and technologies. Even though a single-company focus may limit the extent of generalization, these limitations may be offset by other benefits, such as the ability to control for extraneous sources of variation from organizational-level factors such as organizational culture, structure, and strategies. In addition, Energy Inc. is a large organization with multiple units/departments with sufficient intra-organizational variation, which allowed us to detect a meaningful level of diversity in terms of the antecedent variables included in the model.

One research team member was granted privileged access to the list of all employees working at Energy Inc. To control for possible heterogeneity of respondents’ nationality and cultural background, we specifically targeted the domestic workforce of the headquarters. To enrich our understanding of the empirical context, we had open-ended interviews with 55 executives and engineers, none of whom took part in the main survey. Insights gained from these interviews were useful to decide on the structure and content of the questionnaire. Once the questionnaire draft was prepared, it was pilot tested with 20 engineers and four academic experts. The feedback collected from the pilot study helped us refine the wording and overall structure of the questionnaire items. Pilot responses were excluded from the final analysis. Where possible, we used established scales for the operationalization of our concepts. However, we used the feedback from the interviews and pilot tests to adjust the wording and phrasing of some questionnaire items.

4 Since we did not predict any effect of need for cognition on the exploitation dimension, we did not develop any hypothesis on the moderation effect of time pressure on the link between need for cognition and exploitation.

5 Since proactive personality doesn’t have any effect on the identification dimension there is no hypothesis on the moderation effect of time pressure on the link between proactive personality and identification.

6 We use this pseudonym to ensure anonymity.
Based on the information we obtained from the human resources department of Energy Inc., we identified work units and functional areas with knowledge-intensive tasks—i.e., those units where absorptive capacity is a relevant phenomenon. The total number of employees in these units was 1,400, all engineers working for the company. We sent email invitations to these employees, explaining the study’s goals. Respondents were allowed to take the survey online or fill out the paper in paper-and-pen format. To increase the response rate, we conducted two waves of data collection; the second was initiated two months after the first. We collected usable responses from 646 individuals, corresponding to 46% response rate. We checked for potential non-response bias and detected no systematic differences between participants and non-participants in terms of their age, work experience and functional department. We conducted a multi-group confirmatory factor analysis to control for possible systematic differences between online and paper-and-pen responses and between two waves of data collection. We followed the guidelines Steenkamp and Baumgartner (1998) and Dimitrov (2006) provided. The results showed that the subsets of data obtained from different formats and waves of data collection had both configural and scalar invariance.\footnote{Full results of our invariance tests are available from the corresponding author upon request.}

### 3.2. Measurement scales

To measure our constructs, we adopted established scales from prior studies. All the questionnaire items used a seven-point Likert-type scale, where 1 = Strongly Disagree, 4 = Neither Agree nor Disagree, and 7 = Strongly Agree. Participants were asked to indicate their agreement with the statements.

#### 3.3. Dependent variable

Existing scales for measuring absorptive capacity (i.e., Flatten et al., 2011; Jansen et al., 2005) were developed to measure this construct at the firm level. Since there is no established scale to measure individual-level absorptive capacity, we drew on past studies with a similar focus to ours (i.e., Löwik, 2013; Ter Wal et al., 2011). Using feedback from pre-study interviews with key executives, we combined these scales and identified 19 items to measure our absorptive capacity construct. We then entered these items into an exploratory factor analysis. We eliminated five items with low item-total correlations based on the principal component analysis. Using promax rotation, we conducted principal component analysis again, this time with the remaining 14 items. Three main factors with eigenvalues of over 1 emerged from our analysis, which collectively explains 64.5% of the variance. All items in this analysis had primary loadings of over 0.5. Using these 14 items, we performed confirmatory factor analysis to test the validity of our factor structure better. Our results confirm that the three-factor model fits better with the data ($\chi^2(68) = 127.075$, RMSEA = 0.037, CFI = 0.987, TLI = 0.983) compared to the single-factor model that envisages absorptive capacity as a unitary construct ($\chi^2(71) = 323.638$, RMSEA = 0.074, CFI = 0.946, TLI = 0.931) and that the difference between the two models’ fit is significantly different ($\Delta \chi^2 = 196.563$, $\Delta df = 3$, $p < 0.001$).

Our three-factor structure aligned with the original conceptualization of Cohen and Levinthal (1990) and a recent empirical study by Schleimer and Pedersen (2014). Accordingly, the first dimension of absorptive capacity is Identification, which refers to the extent to which individuals exert effort to find new knowledge and can notice and recognize the benefits associated with it. We used four items to measure Identification dimension: “I am always actively looking for new knowledge for my work”, “I intentionally search for knowledge in many
different domains to look ‘outside the box’”, “I am good at distinguishing between profitable opportunities and not-so-profitable information or opportunities”, and “I easily identify what new knowledge is most valuable to us”. For this construct, the alpha coefficient for reliability was 0.776, and maximal reliability was 0.924, both of which were acceptable (Hancock and Mueller, 2001). Assimilation, the second dimension of absorptive capacity, captures the degree to which individuals can assimilate knowledge originated from outside the firm, and combine it with existing knowledge. Six items were used to measure the Assimilation dimension: “I am deeply involved in appraising the usefulness of external ideas”, “I often analyze the way expertise of external contacts could be related to our business needs”, “I strive to comprehend how external knowledge connects to our ongoing internal R&D activities”, “I take the time to ‘translate’ external knowledge to ensure it is properly understood by my colleagues”, “I make an effort to ‘repackage’ external knowledge to make sure it gets the attention it deserves”, “I develop new insights and ideas by combining external knowledge with existing knowledge available within our firm” (Alpha coefficient = .917, reliability = 0.817). Our third dimension is Exploitation, which refers to the degree to which newly recognized and assimilated knowledge is applied toward commercial ends. We used four items to measure this dimension: “I exploit new knowledge to create new products, services or work methods”, “I constantly consider how I can apply new knowledge to improve my work”, “When an external idea appeals to me, I work vigorously to make sure it is implemented, even if the idea was not originally mine”, “I am willing to take action to make sure that the potential of external ideas I believe in will be realized” (Alpha coefficient = .881, maximal reliability = 0.827).

3.3.1. Independent variables
The need for cognition was measured with a three-item scale developed by Wu et al. (2014). Measurement items were as follows: “I like to be responsible for handling a situation that requires much thinking,” “Thinking is not my idea of fun (reverse-scored),” and “I really enjoy analyzing problems.” The scale showed considerable internal consistency (Cronbach’s alpha = 0.768, maximal reliability = 0.893). We used the scale Parker et al. (2006) developed to measure proactive personality. The four items included in this scale were: “No matter what the odds, if I believe in something, I will make it happen.”, “I love being a champion for my ideas, even against others’ opposition.”, “I am excellent at identifying opportunities.”, and “If I believe in an idea, no obstacle will prevent me from making it happen.” (Alpha coefficient = .863, maximal reliability = 0.811).

The first moderator in our model was job autonomy. To measure this variable, we adopted the scale developed by Morgeson and Humphrey (2006), which is comprised of three-items: “My job gives me a chance to use my personal initiative or judgment in carrying out the work.”, “My job allows me to make a lot of decisions on my own.” and “My job provides me with significant autonomy in making decisions.” (Alpha coefficient = .834, maximal reliability = .911). The second organizational context variable in our model, time pressure, was conceptualized as a perceptual measure and operationalized by four items: “The time deadlines for completing work assignments are too unreasonable.”, “I have to rush to complete my job.”, “There is just not enough time to do my work.”, and “I am constantly working against the pressure of time.” (Kinnick and Vecchio, 1994). The Alpha coefficient and maximal reliability were 0.913 and 0.855, respectively.

3.3.2. Control variables
We incorporated several control variables into our model estimates. Considering the cumulative nature of absorptive capacity (cf. Cohen and Levinthal, 1990), we first controlled for the respondents’ age and years of work experience. Similarly, we asked them to indicate their formal education level (in years). Through technical and professional training programs, individuals’ ability to recognize, acquire, and apply new knowledge could also be enhanced. To control this, we also asked participants to indicate the number of days per year spent on training programs. Working in various technical fields may expose individuals to a wider range of knowledge domains. This could increase their ability to comprehend technological trends more thoroughly. Therefore, we controlled for the respondents’ functional background by calculating their total years working in departments other than their current department.

3.4. Analytical approach
All calculations, including descriptive statistics, alpha coefficients, maximum reliabilities, and confirmatory factor analysis (CFA) in checking for common method bias, developing and estimating models, and testing research hypotheses, were performed using the R from R Core Team (2018) in R-studio. Basic calculations of descriptive statistics and metrics on the construct level were performed in the psych package (Revelle, 2019). CFA in checking for common method bias was carried out in the lavaan package (Rosseel, 2012). We built a structural equation model (SEM) to test the research hypotheses using the lavaan package (Rosseel, 2012). The SEM estimates the direct and moderated effects of independent variables on three dependent variables simultaneously. SEM offers a more comprehensive approach by accounting for latent variables and complex relationships among variables (Hair et al., 2010). Unlike OLS, SEM allows for the simultaneous estimation of multiple regression equations and the examination of both direct and indirect effects among variables (Bollen, 1989). SEM also enables testing and evaluating the overall model fit beyond simply estimating the regression coefficients. It allows researchers to assess the goodness-of-fit statistics, such as chi-square, comparative fit index (CFI), root mean square error of approximation (RMSEA), and standardized root mean square residual (SRMR), to determine how well the hypothesized model fits the observed data. Furthermore, SEM enables the incorporation of measurement error, which is crucial when dealing with observed variables subject to measurement imprecision (Kline, 2015). This feature of SEM was especially important and advantageous for our study since our model includes several perceptual and subjective measures. By accounting for measurement error, SEM improved the accuracy and reliability of our estimates and helped us avoid biased parameter estimates that could have occurred in OLS estimation. It stands to reason that utilizing SEM for our data analysis would be more advantageous, as it considers the intricate interdependencies among variables and provides a more nuanced understanding of the underlying processes. The maximum likelihood (ML) method was used to estimate the SEM model and calculate the model parameters needed to further test the research hypotheses.

3.4.1. Checking for common method bias
We adhered to the recommendations Podsakoff et al. (2012) made to adjust for potential biases resulting from social desirability concerns and common rater effects. We explained to our responders that their responses would be completely anonymous. Additionally, our survey’s questionnaire made it apparent that its purpose was not to gauge or identify good or poor job performance. It’s also important to note that our respondents had higher-than-average levels of education. The likelihood of social desirability bias is inversely related to respondents’ education level, as found by Rindfleisch et al. (2008). To reduce respondents’ use of similar retrieval cues while responding to various questions, we also ensured that the questions and items used to measure the independent and dependent variables were not adjacent.

Besides, we ran some post hoc analyses to check for possible common method bias in our data. We first performed Harman’s one-factor test by entering all measurement items into an exploratory factor analysis. Five unique components with eigenvalues of over one were identified, and they collectively accounted for 64.4 percent of the total variance. This provided circumstantial support for the hypothesis that the variance could not be accounted for primarily by a single common component. Following the guidelines of Podsakoff et al. (2012), we next used
confirmatory factor analysis to compare three models: (a) a model where we assigned each item to its theoretically relevant latent variable, (b) a model where all items were loaded on a common method factor, (c) a model that combined (a) and (b). Our first model with five factors (Identification, Assimilation, Exploitation, Proactive Personality and Need for Cognition) performed well in terms of fit with the data ($\chi^2 = 142 = 677.364, p < 0.000, \text{RMSEA} = 0.076, \text{CFI} = 0.952, \text{TLI} = 0.957$). Our second model, only using a common method factor, showed poor fit ($\chi^2 = 152 = 1943.488, p < 0.000, \text{RMSEA} = 0.135, \text{CFI} = 0.673, \text{TLI} = 0.632$) in comparison to our first model ($\Delta \chi^2 = 1266.1, \Delta df = 10, p < 0.000$). A combination of our first two models also showed a good fit with the data ($\chi^2 = 118 = 383.704, p < 0.000, \text{RMSEA} = 0.059, \text{CFI} = 0.951, \text{TLI} = 0.930$). However, the difference between the first and the combined models in terms of fit was insignificant ($\Delta \chi^2 = 2.66, \Delta df = 24, p > 0.100$). Finally, we applied an unmeasured latent method factor technique following the advice of Podsakoff et al. (2012). The significance of the routes in our models, both with and without the common method component, was thus compared. There was no significant difference between the six pathways for either model. We decided to exclude the common method factor from our estimation models.

3.5. Findings

The descriptive statistics are presented in Table 1. To alleviate possible multicollinearity among variables included in our model, we standardized (mean = 0, standard deviation = 1) the independent and dependent variables. In Table 2, we present the results of the model estimations, which were used to test our hypotheses. Hypotheses 1a, 1b and predicted that the need for cognition would be positively related to individuals’ capacity to identify and assimilate new knowledge, respectively. On the other hand, we did not expect the need for cognition to significantly affect the exploitation capability. We found a positive effect of the need for cognition on the individuals’ capacity to identify ($r = 0.343, p < 0.001$), which supports Hypothesis 1a. However, we did not find any significant effect of the need for cognition on the assimilation dimension ($r = 0.081, p = 0.147$). Thus, Hypothesis 1b was not supported. Contrary to our predictions, we also found that the need for cognition was positively related to individuals’ capacity to exploit new knowledge ($r = 0.233, p < 0.001$).

Our second set of hypotheses was related to the other key dispositional antecedent of individuals’ absorptive capacity – i.e., proactive personality. Against our expectations, we found that proactive personality had a significant and positive effect on identification capacity ($r = 0.432, p < 0.001$). On the other hand, we found support for Hypotheses 2a and 2b since our results suggest proactive personality was positively associated with assimilation ($r = 0.372, p < 0.001$) and exploitation ($r = 0.480, p < 0.001$).

Our subsequent hypotheses focus on the interactive effect of the aforementioned dispositional factors and selected attributes of workplace context (i.e., time pressure and autonomy). In our full model, we also tested the direct effect of time pressure and autonomy on individual-level absorptive capacity. We found that time pressure did not have any effect on identification ($r = -0.032, p = 0.386$), assimilation ($r = 0.035, p = 0.547$) and exploitation ($r = -0.100, p = 0.059$). On the other hand, our results revealed that autonomy had a positive and significant effect on all three dimensions of absorptive capacity (i.e., $r = 0.181, p < 0.001$ for identification, $r = 0.109, p < 0.05$ for assimilation and $r = 0.198, p < 0.001$ for exploitation). Turning our attention to the interaction terms, in Hypotheses 3a and 3b, we predicted that the positive effect of the need for cognition on individuals’ identification and assimilation capacity would be stronger as individuals’ job autonomy increases. Our results were inconsistent with this hypothesis given that individuals with a higher need for cognition did not have a higher capacity to identify ($r = 0.019, p = 0.661$) and assimilate ($r = 0.073, p = 0.097$) new knowledge when given higher job autonomy. Hence, we found no support for Hypotheses 3a and 3b. In line with our Hypotheses 4a, where we predicted a positive moderating role of job autonomy on the relationship between proactive personality and assimilation capacity, we found that proactive individuals’ capacity to assimilate new knowledge increased to a greater extent when these individuals were given higher autonomy in their jobs ($r = 0.163, p < 0.05$). However, we did not detect any significant effect of job autonomy on the link between proactive personality and exploitation dimension ($r = 0.125, p = 0.092$). Therefore, Hypothesis 4b was not supported.

Lastly, we tested the effect of time pressure as a situational constraint. In particular, Hypotheses 5a and 5b predicted that time pressure would reduce the capacity to identify and assimilate new knowledge for those with a high need for cognition. Supporting Hypothesis 5a, we found a significant moderation effect of time pressure on the identification dimension of absorptive capacity ($r = -0.181, p < 0.05$). On the other hand, our results suggested that time pressure had no moderation effect on the relationship between the need for cognition and assimilation ($r = -0.079, p = 0.236$). This means that Hypothesis 5b was not supported. Lastly, we tested whether and how proactive individuals’ capacity to assimilate and exploit new knowledge was affected by higher perceived time pressure. We found that increased time pressure did not affect proactive individuals’ capacity to assimilate ($r = 0.094, p = 0.088$) and exploit ($r = 0.090, p = 0.075$) new knowledge. In other words, we found no support for Hypotheses 6a and 6b. We summarize our results in Table 3 and illustrate significant interaction plots in Fig. 2.

4. Discussion and conclusion

Extensive research underscores the critical need for firms to consistently revitalize and expand their knowledge assets (e.g., Kogut and Zander, 1992; Argote and Ingram, 2000; Klofsten et al., 2010). Organizations must actively seek, access, and leverage external sources of new knowledge, and absorptive capacity has been recognized as a vital element in this pursuit (Cohen and Levinthal, 1990). However, much of

Table 1

Descriptive statistics.

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Note: Correlations 0.14 were significant at the 0.01 level (2-tailed).
the previous research has been centered on the transfer and acquisition of knowledge at the organizational level, leaving a noticeable gap in understanding how individuals recognize, assimilate, and exploit new knowledge that could benefit organizational needs and goals (Hotho et al., 2012; Volberda et al., 2010). Bridging this gap is essential for setting the stage for a comprehensive microfoundational explanation of new value creation that emphasizes the role of individuals within the organization (Felin and Hesterly, 2007).

Our study aimed to contribute to the existing research by investigating the antecedents and drivers of individual-level absorptive capacity (Fel, 2015). The table below summarizes the results of our analysis.

<table>
<thead>
<tr>
<th>Individual &amp; Contextual Predictor</th>
<th>Absorptive Capacity Dimension</th>
<th>Hypothesized Effect</th>
<th>Result</th>
<th>Finding</th>
</tr>
</thead>
<tbody>
<tr>
<td>Need for Cognition</td>
<td>Identification</td>
<td>Positive</td>
<td>Significant (p &lt; 0.000)</td>
<td>H1a supported</td>
</tr>
<tr>
<td>Proactive Personality</td>
<td>Identification</td>
<td>N/A</td>
<td>Significant (p &lt; 0.000)</td>
<td>Non-hypothesized positive effect detected</td>
</tr>
<tr>
<td>Need for Cognition x Autonomy</td>
<td>Identification</td>
<td>Positive</td>
<td>Insufficient (p = 0.661)</td>
<td>H3a supported</td>
</tr>
<tr>
<td>Proactive Personality x Autonomy</td>
<td>Identification</td>
<td>N/A</td>
<td>Significant (p = 0.020)</td>
<td>Non-hypothesized positive effect detected</td>
</tr>
<tr>
<td>Need for Cognition x Time Pressure</td>
<td>Identification</td>
<td>Negative</td>
<td>Significant (p = 0.019)</td>
<td>H5a supported</td>
</tr>
<tr>
<td>Proactive Personality x Time Pressure</td>
<td>Identification</td>
<td>N/A</td>
<td>Significant (p = 0.029)</td>
<td>Non-hypothesized negative effect detected</td>
</tr>
<tr>
<td>Need for Cognition</td>
<td>Assimilation</td>
<td>Positive</td>
<td>Significant (p &lt; 0.000)</td>
<td>H1b supported</td>
</tr>
<tr>
<td>Proactive Personality</td>
<td>Assimilation</td>
<td>Positive</td>
<td>Significant (p &lt; 0.000)</td>
<td>H2b supported</td>
</tr>
<tr>
<td>Need for Cognition x Autonomy</td>
<td>Assimilation</td>
<td>Positive</td>
<td>Significant (p &lt; 0.000)</td>
<td>H3b supported</td>
</tr>
<tr>
<td>Proactive Personality x Autonomy</td>
<td>Assimilation</td>
<td>Positive</td>
<td>Insufficient (p = 0.097)</td>
<td>H5b supported</td>
</tr>
<tr>
<td>Need for Cognition</td>
<td>Assimilation</td>
<td>Negative</td>
<td>Insufficient (p = 0.236)</td>
<td>H5b not supported</td>
</tr>
<tr>
<td>Proactive Personality</td>
<td>Exploitation</td>
<td>Positive</td>
<td>Insufficient (p = 0.088)</td>
<td>H6a not supported</td>
</tr>
<tr>
<td>Need for Cognition</td>
<td>Exploitation</td>
<td>N/A</td>
<td>Significant (p &lt; 0.000)</td>
<td>H1b not supported</td>
</tr>
<tr>
<td>Proactive Personality</td>
<td>Exploitation</td>
<td>Positive</td>
<td>Significant (p &lt; 0.000)</td>
<td>H2b supported</td>
</tr>
<tr>
<td>Need for Cognition x Autonomy</td>
<td>Exploitation</td>
<td>N/A</td>
<td>Insufficient (p = 0.493)</td>
<td>No effect detected</td>
</tr>
<tr>
<td>Proactive Personality x Autonomy</td>
<td>Exploitation</td>
<td>Negative</td>
<td>Insufficient (p = 0.092)</td>
<td>H6b not supported</td>
</tr>
<tr>
<td>Need for Cognition x Time Pressure</td>
<td>Exploitation</td>
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<td>Insufficient (p = 0.088)</td>
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<tr>
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<td>Exploitation</td>
<td>Positive</td>
<td>Insufficient (p = 0.075)</td>
<td>H6b not supported</td>
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</tbody>
</table>
capacity. Drawing on the interactionist perspective (Zhou and Hoever, 2014), we argued that an individual’s ability to absorb new work-relevant knowledge is influenced by a combination of their dispositional attributes and the contextual properties of their work environment. Specifically, we focused on the need for cognition and proactive personality as two critical factors shaping an individual’s ability to absorb information.

Our study revealed that individuals with a high need for cognition possess a greater cognitive capacity and stronger motivation to identify and assimilate new knowledge. Although we did not expect a positive effect, we also found a positive association between the need for cognition and exploitation capacity. This suggests that exploratory and exploitative learning necessitate deep thinking and problem-solving to generate novel ideas for knowledge commercialization (Dollinger, 2003). The link between the high need for cognition and exploitation could be explained by the fact that absorptive capacity dimensions are tightly connected and not isolated. The direction of the search for new knowledge may be influenced by the commercial needs of the firm (Zahra and George, 2002; Volberda et al., 2010). Therefore, once individuals start searching and exploring new knowledge, they must consider how it could be commercialized.

Moreover, we highlighted the importance of proactive personality as another influential factor in shaping absorptive capacity. Previous research consistently reported a positive association between creativity and a proactive personality (Kim et al., 2009). Individuals’ inclination for proactive behavior induced them to challenge the status quo and possess a future-focused vision, which positively affected all three dimensions of absorptive capacity. These proactive behaviors align closely with absorbing new knowledge, as proactive individuals are more likely to explore and exploit external sources of information (Zhou and George, 2001). Against our predictions, we found a significant positive relationship between proactive personality and identification. This could be explained by the fact that proactive individuals, regardless of uncertainty or lack of clarity surrounding the outcomes of their efforts,
actively seek out new opportunities because of their strong drive to learn and dedication to developing innovative ideas (Kim et al., 2009).

Our results reveal that job autonomy does not significantly moderate the relationship between the need for cognition and absorptive capacity dimensions. This unexpected finding suggests that a shared purpose guides individual actions toward collective knowledge absorption, potentially rendering autonomy counterproductive. However, autonomy strengthens the link between proactive personality and two absorptive capacity dimensions (identification and assimilation), aligning with our expectations. Additionally, we find that time pressure negatively impacts the relationship between the need for cognition and the identification dimension, consistent with prior research (Evans et al., 2003; Cazan and Indreica, 2014). Surprisingly, time pressure also hinders proactive individuals’ ability to identify new knowledge, warranting further exploration.

We extend prior micro-level research on creativity and innovation in two significant ways. Firstly, we address the limited insights regarding the conditions under which proactive personality and the need for cognition influence innovative behavior, emphasizing the need for a nuanced understanding of contextual factors that moderate these relationships. Our study adopts an interactionist perspective, considering autonomy and time pressure as critical situational factors that moderate how dispositional traits manifest in innovative actions and idea generation. Secondly, we differentiate innovation and creativity as distinct factors in shaping absorptive capacity across different dimensions, our contextual framework, recognizing the influence of the work environment on absorptive capacity. This unexpected finding suggests that a shared purpose actively seeks out new opportunities because of their strong drive to learn and dedication to developing innovative ideas (Kim et al., 2009).

Managerial implications

Our study underscores significant managerial implications. Managers must recognize the importance of matching individuals with specific dispositional traits to appropriate work environments to enhance their ability to identify, absorb, and effectively utilize new knowledge (Klofsten et al., 2010). Aligning the characteristics of the work context with the workforce’s composition allows managers to manage situational constraints and provide autonomy to their subordinates purposefully. It’s crucial to note that individual traits and the work environment influence various dimensions of absorptive capacity. Managers should make adaptive decisions regarding staffing and design flexible work environments that align with employees’ abilities across different phases of the innovation process. This necessitates tailoring the work environment to accommodate the diverse needs of employees with varying dispositional attributes. For instance, proactive individuals may excel in contexts with higher autonomy and moderate time pressure, facilitating their assimilation and exploitation of knowledge. On the other hand, individuals with a high need for cognition may require a stable and less constrained work environment to optimize their absorptive capacity.

Furthermore, managers should emphasize the significance of knowledge sharing and collaboration within the organization. Fostering a culture that encourages the exchange of ideas and learning from external sources enhances the overall absorptive capacity of the workforce. This can be achieved through initiatives like cross-functional teams, communities of practice, or knowledge-sharing platforms. Overall, our findings emphasize the need for managers to consider both individual traits and situational factors when designing work environments and managing their employees. By doing so, they can harness the full potential of their workforce and create an organizational culture that promotes continuous learning, innovation, and effective knowledge absorption.

6. Limitations and future research directions

While our theoretical framework draws on existing knowledge of the microfoundations of absorptive capacity, we acknowledge certain limitations that should be considered. Firstly, the empirical design of our study is based on data collected from a single company, potentially limiting the external generalizability of our findings. Secondly, our study adopts a cross-sectional design, constraining our ability to establish causal relationships between the variables of interest. To mitigate this limitation, we relied on established theories and prior research to guide the formulation of our hypotheses. Nonetheless, future research would significantly benefit from employing longitudinal or experimental designs to better examine the dynamic nature of the absorptive capacity construct (Lundmark and Klofsten, 2014; Volberda et al., 2010).

Moreover, our study primarily focuses on the individual level of analysis, overlooking the potential influence of factors at higher levels, such as teams or organizations. Future studies could employ multi-level designs to investigate how individual absorptive capacity aggregates and interacts with higher-level factors, influencing organizational-level outcomes (Minbaeva et al., 2014). Lastly, our data relies on self-reported measures, potentially introducing common method bias. Although we employed statistical techniques to mitigate this bias, future research should consider utilizing multiple sources and informants to triangulate and validate the data. By addressing these limitations and delving deeper into these avenues, future research can provide a more comprehensive and nuanced understanding of absorptive capacity and its implications for organizational innovation and learning.

CRediT authorship contribution statement

H. Emre Yildiz: Writing – original draft, Methodology, Formal analysis, Data curation, Conceptualization. Adis Murtic: Writing – original draft, Methodology, Formal analysis, Data curation, Conceptualization. Sergey Morgulis-Yakushe: Methodology, Formal analysis, Data curation. Magnus Klofsten: Writing – original draft, Validation, Supervision, Conceptualization.

Data availability

The data that has been used is confidential.

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