Let's talk about it: the impact of nurses' implicit voice theories on individual agility and quality of care

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Abstract

Purpose – The complexity and uncertainty of healthcare operations increasingly require agility to safeguard a high quality of care. Using a microfoundations of dynamic capabilities perspective, this study investigates the effects of nurses' implicit voice theories (IVTs) on the behaviors that influence their individual agility.

Design/methodology/approach – This research uses quantitative survey data collected from 2,552 Canadian nurses during the fourth wave of the Covid-19 pandemic in the fall of 2021. Structural equation modeling is used to test a conceptual model that hypothesizes the effects of three different IVTs on nurses' creativity, spontaneity, agility and the quality of care they deliver to patients.

Findings – The results reveal that voice-inhibiting cognitions (like "suggestions are criticisms for higher-ups", "I first need a solution or solid data", and "speaking up has negative repercussions") negatively impact nurses' creativity and spontaneity in crafting solutions to problems they face daily. In turn, this affects nurses' individual agility as they attempt to adapt to changing circumstances and, ultimately, the quality of care they provide to their patients.

Practical implications – Even if organizations have little control over employees' pre-held beliefs regarding voice, they can still reverse them by developing and nurturing a voice-welcoming culture to boost their workers' agility.

Originality/value – This study combines two theoretical frameworks, voice theory and dynamic capabilities theory, to study how individual-level factors (cognitions and behaviors) contribute to nurses' individual agility and the quality of care they provide to their patients. It answers the recent calls of scholars to study the mechanisms through which healthcare operations can develop and sustain dynamic capabilities, such as agility, and better face the "new normal".

Keywords Healthcare, Agility, Creativity, Spontaneity, Implicit voice theories

Paper type Research paper

1. Introduction

Healthcare has always been a high-customer-contact environment, where demand can be highly volatile (Fitzsimmons *et al.*, 2008; Irfan *et al.*, 2019). Work in healthcare also tends to be

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very complex, requiring a highly specialized and varied workforce that must collaborate in an environment where work organization is also highly complex (Nembhard *et al.*, 2009). These characteristics create numerous challenges for organizational performance (Fournier and Jobin, 2018). Furthermore, the Covid-19 pandemic has focused our attention on the challenges related to managing operations in healthcare (Alexander *et al.*, 2022; Micheli *et al.*, 2021). This new reality has increased the complexity and uncertainty that have come to define healthcare, paving the way for new ideas and ways of managing operations.

In uncertain operational environments, agility is a vital determinant of performance (Dubey *et al.*, 2022). Agility is a dynamic capability that allows organizations to quickly and successfully adapt to a changing environment (Irfan *et al.*, 2019). While originally conceptualized as a strategic concept (Goldman *et al.*, 1995) and studied at the organizational level of analysis, agility can also be viewed from an interorganizational perspective (supply chain), and at the individual level (Schilke *et al.*, 2018). In this paper, we adopt the individual perspective because organizational agility can be largely predicated on individual factors, such as employees' ability to rapidly face and adapt to changing conditions which, in turn, requires the ability to solve problems and reorganize their work quickly (Secchi *et al.*, 2019). Performing such tasks involves creativity and spontaneity from stakeholders, which can help them quickly develop solutions and improvements outside normal routines to face unforeseen contingencies (Secchi *et al.*, 2019). These capabilities are crucial in dynamic environments because they allow workers, teams and organizations to rapidly reconfigure work to account for process variations and anomalies.

However, process improvement and problem-solving cannot take place unless opportunities and problems are talked about and identified (Tucker and Edmondson, 2002). In a volatile environment like healthcare, this is often best done by staff working in the operational setting such as nurses and other clinicians (Burgess and Radnor, 2012). Once problems have been identified, they can be solved at the operational level or scaled up in the hierarchy when their scope stretches beyond departmental boundaries. Research has shown that worker cognition plays an important role in problem-solving behaviors (Furlan *et al.*, 2019; Mohaghegh and Furlan, 2020; Tucker and Edmondson, 2002). Notably (healthcare) workers must feel that they can safely voice their ideas, concerns and opinions if they are to draw attention to, and face, problems and challenges occurring in the operational setting (O'Donovan and McAuliffe, 2020). To that extent, *implicit voice theories* (IVTs) can negatively influence employees' propensity to speak up about problems and opportunities (Detert and Edmondson, 2011). IVTs are pre-held beliefs that prevent employees from speaking up and valuable knowledge from being shared (Detert and Edmondson, 2011). If employees are afraid of speaking up, it is much less likely that problems will be taken on efficiently and that employees will be able to adapt to changing internal and external dynamics.

In this study, we answer the call of operations management (OM) scholars to study individuals' agility in uncertain contexts (Micheli *et al.*, 2021). This research aims to offer a quantitative and empirical perspective on how IVTs may be an underlying mechanism influencing individual agility in a volatile operational environment (in this case, healthcare during the Covid-19 pandemic). To our knowledge, this relationship has not been studied in the extant literature and may have significant implications for OM researchers and practitioners. To bridge this gap, we draw on voice theory (Detert and Edmondson, 2011) to develop a conceptual model in which we hypothesize that IVTs negatively influence individuals' ability to creatively and spontaneously solve problems, which in turn influences individual-level *agility* and, ultimately, the quality of care nurses provide to patients. Our goal is to answer the following question: *What are the effects of IVTs on nurses' creativity, spontaneity, individual agility and the quality of care they provide to their patients?*

Our research employs a survey that was developed for data collection with Canadian nurses working during the Covid-19 pandemic. Using a quantitative approach increases

external validity and allows us to contribute more generalizable findings. This research contributes to the literature on healthcare OM (Kc *et al.*, 2020) by studying how the cognitions of clinicians may impact their behaviors when facing contingencies in an ever-changing environment. More broadly, we also contribute to the service and behavioral OM literature by investigating individual-level factors (IVTs, creativity, spontaneity and individual agility) that may ultimately contribute to organizational performance by acting as dynamic capability microfoundations (Schilke *et al.*, 2018).

To perform our study, we collected data through an online survey from 2,552 nurses working in the Canadian province of Quebec during the fourth Covid-19 wave, in the fall of 2021. We employed structural equation modeling to test the hypotheses found in our conceptual model. Through this analysis, we found that IVTs had negative effects on nurses' *creativity* and *spontaneity*, which themselves had positive effects on *individual agility*. *Individual agility* was ultimately positively linked to the perceived *quality of care* provided to patients.

The paper is structured as follows. First, the relevant literature on agility, creativity, spontaneity and IVTs is presented, along with our resulting conceptual framework and hypotheses. Second, we describe our research method and provide details regarding our data collection and sample. This section also includes the measurement instrument and discussions regarding reliability, validity and common method variance. Third, we analyze our structural model, present our results and provide details of our controls for endogeneity. Fourth, we discuss these results and their theoretical implications, followed by practical implications. We conclude by discussing the strengths and limits of the study, as well as future research avenues.

2. Literature review and hypotheses

Healthcare is one of the most complex organizational environments due to its multiplicity of stakeholders, fast-paced changes, and the scarcity of resources it must deal with (Denis *et al.*, 2012; Mintzberg, 2002; Zhang *et al.*, 2012). From an OM point of view, healthcare is an environment with high levels of customer interaction (Chase and Tansik, 1983) and volatile demand (Fitzsimmons *et al.*, 2008). The organization of work must be flexible to accommodate the individual needs of patients, but also efficient enough to treat high volumes of patients. Because the patient is the material input and output of the value creation process, high process variation is to be expected (Schneller and Smeltzer, 2006). This variation requires a highly trained, diversified, and autonomous workforce (Nembhard *et al.*, 2009), which also results in role ambiguity over the roles and responsibilities of the stakeholders involved in the care process (Fournier and Jobin, 2018). Adding to this complexity is also healthcare managers' strong task-orientation with a low tolerance for mistakes (Tortorella *et al.*, 2020). These factors create a highly uncertain operational environment for healthcare providers, which has been amplified during the Covid-19 pandemic, where healthcare systems around the world have had to adapt quickly by re-allocating care capacity to face the large numbers of patients battling Covid-19 (Rennert-May *et al.*, 2021; Stengel *et al.*, 2022). This reality has strengthened the call from scholars for research to investigate OM phenomena related to healthcare (Micheli *et al.*, 2021).

To operate in ever-changing circumstances and provide high-quality care, healthcare organizations have to dynamically adapt by being agile in facing these circumstances. While agility can be viewed at the organizational level, the microfoundational perspective of dynamic capabilities focuses on the micro-level elements that influence dynamic capabilities and as such, proposes that individual behaviors can ultimately contribute to organizational agility (Felin *et al.*, 2012; Helfat and Peteraf, 2015; Schilke *et al.*, 2018). To this extent, emerging OM research on volatile service systems has focused on employees' behaviors as predictors of attaining customer needs (Secchi *et al.*, 2019). Behaviors, on the other hand, are in large part predicated on individual cognitions (Tucker and Edmondson, 2002). Of particular importance to the organizational setting are voice behaviors (Morrison, 2023), which lead to ideas and

problems being shared and talked about. However, while organizations can attempt to promote voice among employees, these employees might hold beliefs that prevent them from feeling safe in speaking-up. These are called IVTs (Detert and Edmondson, 2011; O'Donovan *et al.*, 2020). While the extant literature on voice has established the existence of these pre-held beliefs, there remains a dearth of knowledge in our understanding of how these might influence the creativity and spontaneity of individuals and how they, ultimately, might influence their own agility. To study this phenomenon, we developed a conceptual model (Figure 1) that hypothesizes that IVTs negatively influence the creativity and spontaneity of individuals. We also hypothesize that creativity and spontaneity positively influence the agility of individuals, which, in turn, positively impacts the quality of care they provide to patients. In this section, we present our literature review and hypotheses.

2.1 Agility for improved quality of care

According to the resource-based view of the firm, the performance of organizations is in large part predicated on its dynamic capabilities (Eisenhardt and Martin, 2000; Teece *et al.*, 1997). Dynamic capabilities are organizational routines by which resources are reorganized to create value (Eisenhardt and Martin, 2000). More specifically, they are mechanisms through which the fit between the organization and its environment can be maximized (Schilke *et al.*, 2018). In uncertain environments, those dynamic capabilities are crucial for organizations to quickly adapt and reconfigure their resources (Chowdhury and Quaddus, 2017; Mikalef and Pateli, 2017). Thus, over the last ten years, dynamic capabilities have emerged as a fundamental area of research in the OM literature (Akter *et al.*, 2021; Blome *et al.*, 2013; Cadden *et al.*, 2022; Schilke *et al.*, 2018; van Dun and Wilderom, 2021).

In uncertain environments, agility represents a key high-order dynamic capability that allows the organization to quickly and successfully seize opportunities and respond to problems (Irfan *et al.*, 2019), notably because agile systems are able to deal productively with complexity in times of crises or unforeseen events (Bundy *et al.*, 2017). *In fine*, agility is a critical determinant of performance (Akter *et al.*, 2021; Dubey *et al.*, 2022). Agility manifests through the speedy reorganization of resources in the face of changing market circumstances (Blome *et al.*, 2013). According to Fayezi *et al.* (2017), an organization's agility is based on its ability to anticipate changes and their potential effects (*change expectancy*), and on its ability to respond to such changes. Although agility was originally conceptualized at the strategic

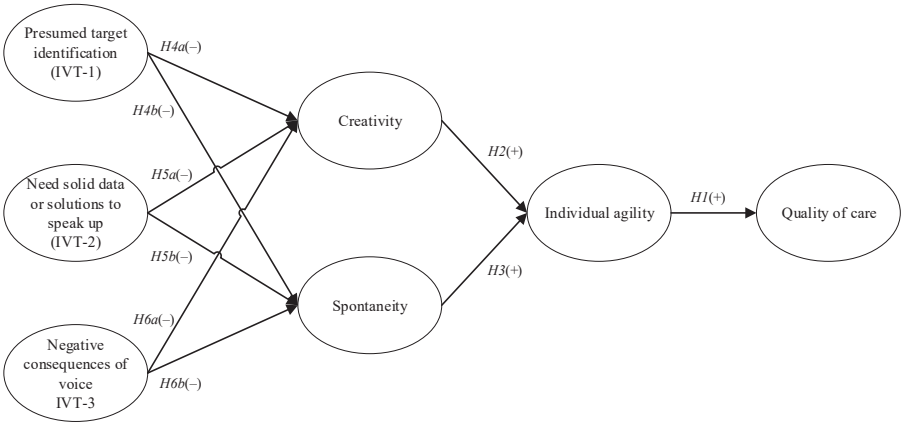


Figure 1.
Theoretical model

Source(s): Figure created by authors

organizational level (Goldman *et al.*, 1995; Teece *et al.*, 2016), the microfoundational perspective has emerged as a relevant approach to studying how agility can be created and developed (Camuffo and Gerli, 2018; Roscoe *et al.*, 2019; Sousa-Zomer *et al.*, 2020; van Dun and Wilderom, 2021; Walter, 2021). Microfoundations refer to the various micro-level elements that support dynamic capabilities occurring at a higher level (Felin *et al.*, 2012). As such, individual agility, also called employee agility (Salmen and Festing, 2022), has been demonstrated as a key predictor of organizational outcomes (Braun *et al.*, 2017; Muduli, 2013). In other words, an agile organization requires an agile workforce (Braun *et al.*, 2017). In this study, we define *individual agility* as the ability of workers (e.g. nurses) to cope with internal and external changes (Braun *et al.*, 2017; Lu and Ramamurthy, 2011; Salmen and Festing, 2022). Internal changes refer to changes to processes or resources within the organization, such as workforce shortages, whereas external changes refer to changes driven by outside factors, such as changing customer demand.

In healthcare, patients receive services that must be provided promptly and effectively by professionals able to coordinate and re-organize frequently (Drupsteen *et al.*, 2016; Nembhard and Edmondson, 2006), in an environment that is highly complex and uncertain (Fournier and Jobin, 2018). This has led to the concept of agility making its way into healthcare organizations, where it has been linked to improved performance (Fischer *et al.*, 2018; Tolf *et al.*, 2015; Vaishnavi *et al.*, 2019). In healthcare organizations, the quality of care provided to patients by clinicians is a key dimension of organizational and individual performance (Bodenheimer and Sinsky, 2014; Donabedian, 2005). In our study, the quality of care refers to the quality of clinical care at the clinician-patient level; or directly provided to the patient by the clinician (Donabedian, 2005). It does not pertain to administrative quality control assessments. While relatively scarce, evidence has emerged regarding the positive effects of clinicians' individual agility on the quality of care they provide to patients (Bosco, 2007). The positive effect of individual agility on quality of care is also supported by the extant literature asserting that individual agility leads to individual performance (Braun *et al.*, 2017; Salmen and Festing, 2022). Based on this, we hypothesize that *individual agility* will positively influence the quality of care a nurse provides to patients.

H1. *Individual agility* will be positively linked to the *quality of care* provided by a nurse to her patients.

2.2 Creativity and spontaneity as determinants of individual agility

Individual cognitions and behaviors can also be considered as microfoundations of dynamic capabilities, and by extent, of agility (Helfat and Peteraf, 2015; Schilke *et al.*, 2018; van Dun and Wilderom, 2021). According to the extant literature, innovative work behaviors and speed are the key drivers of individual agility (Braun *et al.*, 2017; De Jong and Den Hartog, 2010; DeRue *et al.*, 2012; Salmen and Festing, 2022). Innovative work behaviors lead to individuals adapting to changes by developing novel solutions to problems (De Jong and Den Hartog, 2010). These solutions can be obtained through a combination of pre-existing routines that help solve the immediate problem, also called *first-order problem solving* or *intuitive problem solving*, and through double-loop learning that aims to identify and eliminate the root causes of the problem, also called *second-order* problem solving or *systematic problem solving* (Furlan *et al.*, 2019; Gemmel *et al.*, 2019; Mohaghegh and Furlan, 2020; Tucker and Edmondson, 2002). In uncertain service systems, such as healthcare, front-line employees must also frequently improvise solutions to problems that fall outside of the normal work organization and processes (Pina e Cunha *et al.*, 2014), in order to effectively reconfigure services. For example, during the first year of the Covid-19 pandemic, nurses had to find alternatives to allow family members to still be in contact with their loved ones who were isolated due to a Covid-19 infection. In the service OM literature, this innovative work behavior is known as *creativity* (Secchi *et al.*, 2019). More specifically, *creativity* is a

discretionary behavior (Ng and Feldman, 2012) and refers to employees' ability to go beyond standard practices and routines to craft solutions that can respond to internal or external changes. It has been shown to be a key determinant of an employee's ability to adapt to unforeseen events (Secchi *et al.*, 2019). Therefore, we hypothesize that the *creativity* of nurses will positively influence their *individual agility*.

H2. *Creativity* will be positively linked to *individual agility*.

However, while the context of healthcare often demands that providers craft novel solutions, *creativity* alone is not sufficient. According to Nayak *et al.* (2020, p. 293) *"in skilled adaptive action, practitioners spontaneously differentiate and respond in situ"* (Nayak *et al.*, 2020, p. 293). This points to the importance of *spontaneity* in adaptation processes and building dynamic capabilities. *Spontaneity*, as a behavior (Vera and Crossan, 2005), refers to employees' ability to respond to changes quickly, and in real-time (Secchi *et al.*, 2019). For example, a nurse working in a medical clinic may observe a patient suddenly having an epilepsy attack. The nurse would then immediately make this her priority and follow the appropriate guidelines to ensure the safety of that patient. Considering that quickness, as mentioned previously, is a key determinant of individual agility (DeRue *et al.*, 2012; Salmen and Festing, 2022), we posit that *spontaneity* positively impacts nurses' ability to react to external and internal changes (*individual agility*).

H3. *Spontaneity* will be positively linked to *individual agility*.

2.3 Implicit voice theories

The Organizational Behavior (OB) literature has long established that employee voice is an important driver of improvement behaviors (Morrison, 2023; Nembhard and Edmondson, 2006). Morrison (2023, p. 2) defines voice as the intention to improve or change through the "*communication of ideas, suggestions, concerns, problems, or opinions about work-related issues"*. Voice behaviors include such things as asking questions, sharing opinions with colleagues, and providing information, feedback, help, or solutions regarding problems or opportunities (O'Donovan *et al.*, 2020). Voice is firstly predicated on employees having some ideas or concerns to share, and then being motivated to do so (Morrison, 2023). For example, employees with high commitment tend to show more voice about ideas to improve occupational safety (Tucker and Turner, 2015). If employees have ideas and are motivated to share them, voicing behaviors can then be influenced by other factors such as attitudes, emotions, leadership, relationships, and context (Morrison, 2023). In contrast to voice, silence takes place when ideas, opinions, and information are withheld by employees. This can, notably, lead to individuals not speaking up about important errors or safety issues (Knoll and Van Dick, 2013). As with voice, silence can be influenced by leader behaviors, as well as individual and contextual factors (Morrison, 2023).

Among the predictors of employee silence are IVTs. IVTs are subtle barriers in organizations that prevent employees from speaking up (Detert and Edmondson, 2011). More precisely, they are "*taken-from-granted beliefs about the risk and appropriateness of speaking-up"* in organizations, which are usually attributed to organizational culture and climate, as well as to managerial behaviors (Detert and Edmondson, 2011, p. 463). Employees' IVTs are not specific reactions related to current events, but rather they are beliefs shaped by various life and work experiences in organizations that evolve over time (Detert and Edmondson, 2011). By preventing employees from speaking-up, IVTs can result in important information or knowledge not being shared. This can also lead to problems or opportunities not being identified and tackled (Detert and Edmondson, 2011). In their work, Detert and Edmondson (2011) identify five IVTs. In this paper we focus on the following three: (1) *presumed target identification* (IVT-1) refers to worker's perceptions that suggestions tend to be viewed as

personal criticism by those higher in the organizational hierarchy, (2) *need solid data or solutions to speak up* (IVT-2) refers to workers' belief that they can safely speak-up only if they have complete solutions or solid data to offer, and (3) *negative consequences of voicing* (IVT-3), which refers to workers' belief that speaking-up can lead to negative consequences. We did not include the two remaining IVTs, *don't bypass the boss upward* (IVT-4) and *don't embarrass the boss in public* (IVT-5) for specific reasons. The first three IVTs, contrary to these last two, include causality in their formulation. This is important, because an implicit theory is a belief structure where cognitive representation is complemented by a causal assumption (Anderson and Lindsay, 1998; Detert and Edmondson, 2011). Since implicit theories "are usually poorly articulated" (Chiu *et al.*, 1997; Detert and Edmondson, 2011; Levy *et al.*, 2006), we kept the most specific ones regarding cognitive representation and implied causality. Moreover, IVT-1 (*presumed target identification*) implies by definition that higher hierarchy perceives suggestions as criticism (Detert and Edmondson, 2011). This appears conceptually as encompassing IVT-4 and IVT-5. It also includes many possible "targets" contrarily to IVTs 4 and 5 which are not the best representatives of the multidisciplinary work and the complexities of authority lines on employees. Knowing who is "the boss" is not that clear on the field. Thus, we determined that IVT-1 was more adaptable to today's healthcare environment instead.

The effects of worker cognitions on improvement behaviors are particularly salient in healthcare (Gemmel *et al.*, 2019; Tucker and Edmondson, 2002). For example, highlighting the need for change, exposing risks of human error, or suggesting that well-established guidelines may no longer be appropriate may appear risky to healthcare professionals (Tucker and Edmondson, 2002). In addition, healthcare organizations are highly complex social systems involving political, leadership, and power-sharing considerations (Denis *et al.*, 2012; Fournier and Jobin, 2018; Mintzberg, 2002). In healthcare, the top of the professional hierarchy is occupied by physicians, not nurses (Fournier *et al.*, 2021, 2023). While collaboration is frequent and continuous, the hierarchical ascendance physicians have could, for example, foster IVTs among nurses. This is also compounded by the typical gender imbalance among healthcare workers, particularly among nurses. Studies have shown that women in healthcare teams are less likely to speak-up, ask questions, and give opinions than men (Atwal and Caldwell, 2005; Martinez *et al.*, 2015). In other words, the three selected IVTs are likely to exist among nurses. Thus, because we know that individual beliefs will influence behaviors related to workplace change, improvement, and adaptation, we hypothesize that IVTs will, overall, negatively impact nurses' *creativity* and *spontaneity*.

Zooming in on IVT-1, which deals with presumed target identification, previous research has shown that service employees' individual beliefs of innovation readiness and subsequent innovative work behavior are influenced by their perception of their higher-up's innovation support and transformational leadership (Tan *et al.*, 2021). Afsar and Masood (2018) also showed that transformational leadership behavior impacted nurses' creative self-efficacy, which also aligns with research demonstrating that employees are more likely to undertake initiative when managers welcome participation and voice (Wanberg and Banas, 2000). Following this line of reasoning, in the absence of such leader support, we hypothesize that nurses who believe that higher-ups tend to view suggestions as criticism (IVT-1) will show lower levels of both *creativity* and *spontaneity*.

H4. Perception levels of IVT-1 will be negatively linked to *creativity* (H4a) and *spontaneity* (H4b).

Furthermore, previous research has shown that employees are more likely to speak up about flaws (and, hence, possible solutions) at work, when there is a considerable amount of objective information on the issue at hand (Shepherd *et al.*, 2019). This is because an individual's beliefs are shaped by the information related to their environment (Hedström and

Swedberg, 1998), which then impacts that individual's voice-related behaviors (Morrison, 2011). In line with this, we hypothesize that nurses who think that speaking-up should only be done when one has complete solutions or data (IVT-2) will exhibit lower levels of *creativity* and *spontaneity*.

H5. Perception levels of IVT-2 will be negatively linked to *creativity* (H5a) and *spontaneity* (H5b).

Finally, workers who tend to be anxious and worrisome, for instance about how they come across among their co-workers, tend to submit fewer ideas (Yokozawa *et al.*, 2021). Such anxiousness is further accelerated when employees use their voice to prohibit undesirable behaviors or to point out problems that might cause serious losses (Welsh *et al.*, 2022). Notably, Lee and Dahinten (2021) showed that the fear of speaking-up negatively impacted nurses' voice-related behaviors in the workplace. Thus, we hypothesize that nurses who believe that speaking-up, in their organization, can lead to negative consequences (IVT-3) will demonstrate lower levels of *creativity* and *spontaneity*.

H6. Perception levels of IVT-3 will be negatively linked to *creativity* (H6a) and *spontaneity* (H6b).

3. Method

To ensure the methodological fit of our research, we followed the guidelines of Edmondson and McManus (2007) on the internal consistency between the elements of the research project, along with the more specific recommendations of Caniato *et al.* (2018) for research in OM. Since the aim of our study is to test theory-driven hypotheses, survey research appears as an appropriate methodological design (Edmondson and McManus, 2007). Our deductive, quantitative approach is also coherent with the current state of research on voice and agility, which are well-established theories in the OM and OB literatures (Edmondson and McManus, 2007). In this section, we account for our data collection procedure, measurement scales, reliability, and validity, while also discussing common method variance.

3.1 Sample and survey procedure

We developed and used a survey to test our conceptual model. The survey was sent to 10,000 nurses in the Canadian province of Québec, during the fall of 2021. The data collection was done in collaboration with the *Ordre des Infirmières et Infirmiers du Québec* (OIIQ), which is the regulatory agency that oversees the practice of nursing in the province. An email containing a link to a survey hosted on the Qualtrics platform was sent to each participant. The email included a summary of the research project and explained the reasons why the respondents were being solicited and the promise that their data would be analyzed anonymously/confidentially. The individual respondents had to meet the following criteria: be registered as a nurse with the OIIQ and be actively practicing nursing in a recognized governmental healthcare organization at the time of survey completion.

In total, we received 2,552 completed and usable responses, for a response rate of 25.52%. The sample was made up of roughly 89% women. Around 70% of the respondents were aged between 26 and 50 years old, with an average of 14.75 years of experience practicing nursing. These demographics are representative of the population of nurses in Québec (Marleau, 2021). We assessed non-response bias by contrasting early and late responses to the survey (Armstrong and Overton, 1977). We compared the first and last 50 responses for *presumed target identification* (IVT-1), *creativity*, and *individual agility*, and did not observe any significant differences.

3.2 Measures

The three IVTs were measured using scales on a seven-point Likert scale (1 = strongly disagree to 7 = strongly agree) from Detert and Edmondson (2011). Minor changes were made to the scales to ensure that they were adapted to the organizational reality of the healthcare respondents. *Presumed target identification* (IVT-1) was operationalized using four items that measured respondents' perceptions that those higher in the organizational hierarchy tend to view suggestions as personal criticism ($\alpha = 0.903$). An example of item is: "*It is not good to question the way things are done because those who have developed the routines are likely to take it personally*".

Need solid data or solutions to speak up (IVT-2) also used four items ($\alpha = 0.828$). These measured respondents' perceived need to already have solid data or complete solutions to offer in order to safely speak up about their concerns or ideas. The following is an example of item used for this scale: "*Unless you have clear solutions, you shouldn't speak up about problems*".

Finally, *negative consequences of voice* (IVT-3) was measured using four items that assessed respondents' belief that speaking up, challenging, or raising concerns about an issue can be seen as disloyal and may lead to negative consequences at work ($\alpha = 0.914$). The items used for measurement of this construct included the following example: "*Speaking up at work about possible improvements sets you up for retribution by those above you who felt threatened by your comments*".

Creativity and *spontaneity* were operationalized using scales adapted from Secchi *et al.* (2019). Both scales used three items measured on a seven-point Likert scale (1 = strongly disagree to 7 = strongly agree). The items used to measure *creativity* assessed the respondent's general ability to deviate from standard processes and routines in order to respond to contingencies ($\alpha = 0.753$). An example of item is: "*I often deviate from standard routines to solve problems*". The items used to measure *spontaneity* assessed respondents' ability to rapidly respond to these contingencies ($\alpha = 0.829$). These items included the following example: "*I often have to figure out actions in the moment*".

The *individual agility* construct was operationalized using four items from Lu and Ramamurthy (2011), using a seven-point Likert scale (1 = strongly disagree to 7 = strongly agree). These items measured the respondents' perceptions of how they were able to make the necessary operational adjustments in the face of unforeseen events, such as a sudden increase in demand, stockouts, or missing personnel ($\alpha = 0.839$). An example item is: "*I am able to quickly adjust when there are issues related to workforce shortages*".

Perceived *quality of care* was measured by three items using a seven-point Likert scale (1 = strongly disagree to 7 = strongly agree) that assessed respondents' perceptions regarding the level of quality of nursing care they provided to patients on their nursing unit. Self-assessed measures of quality of nursing care have been deemed as reliable and valid by researchers, notably because they have been demonstrated to be strongly related to secondary measures of patient outcomes such as infection and mortality (Aiken *et al.*, 2017; McHugh and Stimpfel, 2012). The items were operationalized based on the instrument developed by Aiken *et al.* (2002). An example of item is: "*I provide my patients with a high level of nursing care.*"

Finally, we also added various individual and contextual control variables. First, we controlled for participants' *age*, *gender* (0 = male, 1 = female), *experience*, and *level of nursing education* (*LNE*). *Age* was measured using a categorization based on a 5-year range (see Table 3). *Experience* measured the number of years of nursing practice for each respondent. LNE was measured using a 4-level variable corresponding to the level of post-secondary education the respondent held at the time of data completion (1 = college (technical) degree; 2 = undergraduate degree, 3 = graduate degree, 4 = doctoral degree). We controlled for these variables in accordance with the recommendations of the OB literature, since they have been shown to sometimes have an effect on the criterion variables (Morrison, 2023). We also controlled for the organizational context in which respondents worked. We used a binary

variable (*Org-Setting*) to control whether respondents worked in a hospital setting or not (0 = non-hospital, 1 = hospital). All survey items are presented in Table 2.

3.3 Measurement reliability and construct validity

The reliability of the latent constructs was tested using a two-step approach, as suggested by Graham (2006). Using model fit indices and chi-square, we selected the Tau equivalent model from a group comprised of the parallel, essentially Tau-equivalent, and congeneric models. This also results in reliability being estimated through Cronbach's alpha (0.753–0.914). The composite reliability values were also calculated and ranged from 0.756 to 0.914, all above the generally accepted threshold of 0.70.

To test the validity of the measurement model, we performed a confirmatory factor analysis (CFA) using AMOS 27. We first assessed construct validity by testing the fit of the measurement model using the Maximum Likelihood approach (ML), for which results indicated a good fit with RMSEA = 0.0552, CFI = 0.952, IFI = 0.952, and SRMR = 0.053.

Convergent validity was assessed by evaluating the standardized factor loadings in conjunction with the average variance extracted (AVE) for each latent construct. All factor loadings were significant ($p < 0.001$) and above the recommended value of 0.5 (0.651–0.942), which indicates convergent validity (Hair *et al.*, 2010). Convergent validity was further reinforced through AVE values ranging from 0.521 to 0.726, meaning that the constructs accounted for more than 50% of the items' variance (Ambulkar *et al.*, 2015). We tested for discriminant validity by comparing the correlations between constructs with their square root of AVE values. Discriminant validity was supported because the square roots of AVE were all larger than the correlations between pairs of constructs (Fornell and Larcker, 1981; Henseler *et al.*, 2015). Tables 1 and 2 provides all measurements discussed in this section.

3.4 Common method bias

Common method bias is an issue generally associated with survey-based research that can affect the reliability and validity of measured constructs as well as parameter estimates (Podsakoff *et al.*, 2012). We used a combination of procedural and statistical strategies to address this issue (Podsakoff *et al.*, 2012). Our procedural strategy involved providing a cover story and clear instructions to respondents, which has been shown to increase the likelihood of respondents providing accurate answers (Aronson *et al.*, 1998). We also employed reverse-coded items to reduce respondents' motivation to respond stylistically. We further followed the recommendations of Podsakoff *et al.* (2012) by psychologically separating the dependent and independent variables, and also by guaranteeing anonymity to respondents.

Our statistical controls were twofold. First, we introduced a single latent factor into the measurement model and performed a CFA using the latent factor test (Podsakoff *et al.*, 2012). The results indicated minimal common method bias because the factor loadings did not lose significance and the model fit was not improved. Second, as recommended by OM scholars (Dubey *et al.*, 2019), the marker variable technique was used by adding an unrelated marker variable to the model. The revised model was then compared to the initial model based on the recommendations of Lindell and Whitney (2001), where no loss of significance in the correlations was observed. Considering the steps taken to control for common method bias, we posit that it is not a significant issue in this study.

4. Results

4.1 Model estimation

Structural equation modeling was used to test the hypotheses presented in Figure 1. We used a model-trimming approach (Ullman and Bentler, 2012), by progressively removing non-

	Standardized regression weights	Reliability using Graham (2006)	Composite reliability	Average variance extracted (AVE)	α
Presumed target identification (IVT-1)		0.903	0.904	0.706	0.903
IVT-1a	0.849				
IVT-1b	0.928				
IVT-1c	0.897				
IVT-1d	0.661				
Need solid data or solutions to speak up (IVT-2)		0.828	0.832	0.555	0.828
IVT-2a	0.809				
IVT-2b	0.812				
IVT-2c	0.695				
IVT-2d	0.651				
Negative consequences of voice (IVT-3)		0.914	0.914	0.726	0.914
IVT-3a	0.851				
IVT-3b	0.883				
IVT-3c	0.811				
IVT-3d	0.861				
Creativity		0.753	0.756	0.521	0.753
Creativity-1	0.771				
Creativity-2	0.691				
Creativity-3	0.675				
Spontaneity		0.829	0.834	0.629	0.829
Spontaneity-1	0.657				
Spontaneity-2	0.864				
Spontaneity-3	0.842				
Individual agility		0.839	0.842	0.602	0.839
Agility-1	0.682				
Agility-2	0.820				
Agility-3	0.801				
Agility-4	0.713				
Quality of care		0.883	0.883	0.716	0.883
Quality-1	0.907				
Quality-2	0.942				
Quality-3	0.781				

Note(s): All values are significant at the 0.001 level. The corresponding survey items are in Table 2
Source(s): Table created by authors

Table 1.
Properties of the measurement model

significant paths and assessing model fit. The results of the analysis show a good fit with RMSEA = 0.055, CFI = 0.957, IFI = 0.958, and SRMR = 0.051.

4.2 Directs effects

The results presented in Figure 2 show that *individual agility* ($\beta = 0.360, p < 0.001$) positively and significantly predicted perceived *quality of care*, in support of H1. *Creativity* ($\beta = 0.349$, $p < 0.001$) and *spontaneity* ($\beta = 0.305$, $p < 0.001$) were both positively and significantly correlated with *individual agility*, supporting H2 and H3. IVTs showed significant effects on various variables. IVT-1 did not load significantly onto *creativity*, invalidating H4a. It, however, correlated negatively and significantly with spontaneity ($\beta = -0.192$, $p < 0.001$), providing support for H4b. IVT-2 showed negative and significant correlations with both *creativity* ($\beta = -0.425, p < 0.001$) and *spontaneity* ($\beta = -0.342, p < 0.001$), in support of H5a

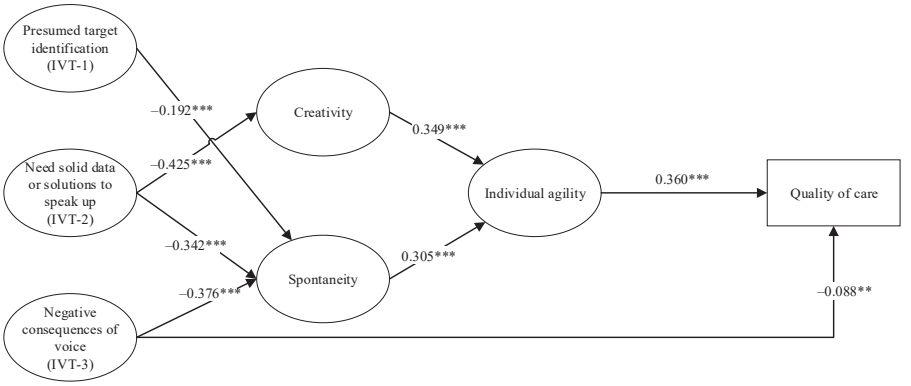
Presumed target identification (*IVT-1*)
Someone who helps create a process or routine is likely to be offended when others suggest changes. (*IVT-1a*)
It's risky to challenge existing processes because it may be seen as questioning the wisdom of the individuals who established or support them. (*IVT-1b*)
Speaking up to suggest a better way of doing some thing is likely to offend the person(s) currently in charge of the process or product you're speaking about. (*IVT-1c*)
It is not good to question the way things are done because those who have developed the routines are likely to take it personally. (*IVT-1d*)
Need Solid Data or Solutions to Speak-up (*IVT-2*)
Presenting underdeveloped, under-researched ideas to your group is never a good idea. (*IVT-2a*)
To look good when speaking up with an idea or suggestion you have to be able to answer every question you get asked. (*IVT-2b*)
Saying "I don't know" or "I'm not sure" when being questioned about some aspect of a new idea you're presenting puts you in a bad position. (*IVT-2c*)
Unless you have clear solutions, you shouldn't speak up about problems. (*IVT-2d*)
Negative Career Consequences of Voice (IVT-3)
If you want advancement opportunities, you have to be careful about pointing out needs for improvement to those in charge. (*IVT-3a*)
You are more likely to be rewarded in organizational life by "going along quietly" than by speaking up about ways the organization can improve. (*IVT-3b*)
Pointing out problems, errors, or inefficiencies might very well result in lowered job evaluations. (*IVT-3c*)
Speaking up at work about possible improvements sets you up for retribution by those above you who felt threatened by your comments. (*IVT-3d*)
Creativity; *In my nursing unit . . .*
I rarely try new approaches to solve problems. (*Creativity-1*)
I often deviate from standard routines to solve problems. (*Creativity-2*)
I often have to be creative to satisfy patients' needs. (*Creativity-3*)
Spontaneity; *In my nursing unit . . .*
I often have to figure out actions in the moment. (*Spontaneity-1*)
I rarely have to respond in the moment to unexpected problems. (*Spontaneity-2*)
I frequently have to deal with unanticipated events on the spot. (*Spontaneity-3*)
Individual agility; *In my nursing unit . . .*
I can quickly scale up or down our service levels to support changes in demand for services. (*Agility-1*)
I am not able to quickly adjust when there are issues related to supplies shortages. (*Agility-2*)
I am able to quickly adjust when there are issues related to workforce shortages. (*Agility-3*)
I rapidly implement solutions to fulfill changes to patient's needs. (*Agility-4*)
Quality of care, *In my nursing unit . . .*
I provide my patients with a high-level of nursing care. (*Quality-1*)
My patients are provided with a level of nursing care that meets their needs. (*Quality-2*)
I offer my patients nursing care that is consistent with the requested standards. (*Quality-3*)

Table 2.
Survey items

Source(s): Table created by authors

and H5b. And although IVT-3 had no significant effect on *creativity*, thus invalidating H6a, it did correlate negatively and significantly with *spontaneity* ($\beta = -0.376\, p < 0.001$), in support of H6b. No direct effects of IVTs were observed on *agility* or *perceived quality of care*, except for a negative and significant effect of IVT-3 on perceived *quality of care* ($\beta = -0.088$, $p < 0.01$).

The results showed that the control variables *age*, *gender*, and *experience* were non-significant. LNE showed a significant effect on IVT-2 ($\beta = 0.110$, $p < 0.01$), meaning that respondents with a higher level of education had higher levels of IVT-2. All other effects of LNE were non-significant. *Org-setting* displayed significant effects on *creativity* ($\beta = -0.100$, $p < 0.01$) and *spontaneity* ($\beta = 0.080$, $p < 0.01$) but showed no significant effect on any other variable. While IVTs had statistically significant Pearson correlations with *perceived quality of care* (see Table 3), these associations became statistically non-significant after the variables



Note(s): $p < 0.01$**; $p < 0.001$***
All effects are significant within the 95 percent confidence interval
Control variables: *Age, gender, experience*, all effects are non-significant; *LNE→IVT-2 (0.110**)*, all other effects are non-significant; *Org-setting→Creativity (–0.100**), Org-setting→Spontaneity (0.080**)*, all other effects are non-significant
Source(s): Figure created by authors

Figure 2.
Structural model

were added into the conceptual model. The same was found regarding the control variables. Furthermore, even if two of the control variables showed significant effects on variables in the model, no significant interaction effects were found after analysis.

4.3 Causality

Before interpreting the results, endogeneity must be discussed (Guide and Ketokivi, 2015; Soytas *et al.*, 2019). IVTs were conceptualized as independent variables to the *creativity*, *spontaneity*, *agility,* and *perceived quality of care* variables, not the other way around. While these relationships are hypothesized based on the extant scientific literature, we still precautiously assessed endogeneity by correlating the exogenous variables with the error terms of the endogenous variables. All correlation coefficients were non-significant. As a further precaution, we ran a separate analysis of a structural model in which we reversed the directionality of the relationships hypothesized in our conceptual model. All model fit indices were lower than for the conceptual model. This leads us to posit that endogeneity is not an important concern.

As a further precaution for endogeneity concerns, we implemented the Gaussian copulas approach (Hult *et al.*, 2018; Park and Gupta, 2012) using Smart-PLS. This approach has become increasingly popular for survey research in various management sciences (Gielens *et al.*, 2018; Sullivan *et al.*, 2023; Vomberg *et al.*, 2020) because it does not call for the use of specific instruments. Furthermore, the Gaussian copulas approach can also be used as a supplemental control for common method variance which may also be a source of endogeneity (Vomberg *et al.*, 2020). To implement this approach, we inserted the copulas for IVT-1, IVT-2, and IVT-3 as dependent variables in our model, while also inserting the copulas for *creativity*, *spontaneity*, and *individual agility* as additional regressors. For example, the copula for agility is obtained as $Agility_i^c = \varnothing^{-1}[H_{Agility}(Agility_i)]$ where $\varnothing^{-1}$ represents the inverse of the normal cumulative distribution function and $H_{Agility}$ represents the empirical cumulative distribution of *agility*. The approach requires that all variables be nonnormally distributed (Hult *et al.*, 2018). Shapiro–Wilk and Kolmogorov–Smirnov tests were used to confirm

Table 3.
Descriptive statistics and correlations

Constructs and variables		Mean	SD	1	2	3	4	5	6	7	8	9	10	11
1	Age	5.28	2.29											
2	Gender[a]	0.89	0.30	0.139										
3	Experience	14.75	10.77	0.850**	0.067**									
4	LNE[b]	2.15	1.061	0.117**	−0.13	0.173**								
5	Org-setting[c]	0.56	0.50	−0.220**	−0.009	−0.209**	−0.120**							
6	IVT-1	4.18	1.34	−0.082*	−0.012	−0.099*	0.013	0.028						
7	IVT-2	3.96	1.22	−0.100*	0.004	−0.115*	0.121**	0.031	0.599**					
8	IVT-3	3.60	1.43	−0.010	−0.011	−0.062*	0.038	0.001	0.622**	0.590**				
9	Creativity	4.69	0.99	0.045*	0.010	0.029	0.009	−0.114**	−0.075**	−0.062**	−0.069**			
10	Spontaneity	5.70	0.94	−0.060*	−0.006	−0.021	0.038	0.097**	−0.196**	−0.203**	−0.157**	0.366**		
11	Individual agility	4.29	1.20	0.142*	0.019	0.158*	0.056	−0.039	−0.219**	−0.198**	−0.281**	0.238**	0.217**	
12	Quality of Care	5.88	0.801	0.126*	−0.089	0.176*	−0.045*	−0.035	−0.173**	−0.159**	−0.186**	0.052**	0.092**	0.294**

Note(s): *$p < 0{,}05$**$p < 0{,}01$ (two-tailed); n = 2,252
Age: 1= <20; 2 = 21 to 25; 3 = 26 to 30; 4 = 31 to 35; 5 = 36 to 40; 6 = 41 to 45; 7 = 46 to 50; 8 = 51 to 55; 9 = 56 to 60; 10 = 61 to 65; 11 = >65
LNE = Level of nursing education, IVT = Implicit voice theory
[a] 0 = male, 1 = female
[b] 1 = college (technical) degree; 2 = undergraduate degree, 3 = graduate degree, 4 = doctoral degree
[c] 0 = non-hospital, 1 = hospital
Source(s): Table created by authors

the nonnormality of endogenous regressors ($p < 0.001$). The bootstrapping method was then used to assess the significance of the copulas (Park and Gupta, 2012). Since the analysis showed that none of the copula coefficients were significant, with p-values ranging from 0.21 to 0.83, it is possible to conclude that endogeneity is not a critical concern for our model (Hult *et al.*, 2018).

5. Discussion

The results of our study generally support our hypothesized model. Our findings further our understanding of how worker cognitions and behaviors influence agility in uncertain contexts. Through the lens of voice theory (Detert and Edmondson, 2011), our resulting model provides evidence regarding the deleterious effects of voice-inhibiting cognitions (i.e. *IVTs*) on nurses' *creativity* and *spontaneity* in crafting solutions to operational problems they face daily. Our results then show how these behaviors impact nurses' *individual agility* as they attempt to adapt to changing circumstances and, ultimately, the *quality of care* they provide to patients. More precisely, our results show that the perception that solid data or complete solutions are needed in order to speak-up is particularly detrimental when it comes to our respondents (nurses). Our research contributes an enhanced understanding of how voice-related cognitions can negatively impact micro-level dynamic capabilities. It also broadens our understanding of the determinants of agility in healthcare, from the angles of dynamic capabilities theory and voice theory, as we will elaborate below.

5.1 Theoretical implications

The microfoundational view of agility as a dynamic capability states that individual-level factors contribute to organizational-level capabilities (Felin *et al.*, 2012; Helfat and Peteraf, 2015; Schilke *et al.*, 2018). This, in turn, leads to better performance, especially in uncertain contexts (Akter *et al.*, 2021; Gligor *et al.*, 2015). Our results provide further support for these assertions by extending this notion into healthcare. Nurses are core employees of healthcare organizations that play a key role in organizational performance but at the same time face high job demands. Our findings show that higher levels of *individual agility* from nurses led to better perceived *quality of care* provided to patients, which in itself represents a building block for organizational performance in healthcare. While this is in line with the general literature on employee agility (Braun *et al.*, 2017; Salmen and Festing, 2022), it also brings further support to the argument from the OM literature that employee agility is a key dimension of service agility (Alavi *et al.*, 2014; Vázquez-Bustelo *et al.*, 2007).

In recent years, there have been calls from scholars in the Management and OM fields to study the microfoundations of dynamic capabilities to improve our understanding of how such capabilities are created, developed, or maintained (Helfat and Peteraf, 2015; Schilke *et al.*, 2018; van Dun and Wilderom, 2021). Based on these works, we argued that *creativity* and *spontaneity* are individual behaviors that influence *individual agility*. Our results show that they indeed positively and significantly influence nurses' individual agility, with relatively similar effect sizes. Higher levels of *creativity*, or the ability to solve problems by crafting solutions outside of normal routines, favored nurses' ability to adapt to unforeseen changes, such as a sudden increase in the number of patients under their responsibility. Similar results were observed regarding nurses' *spontaneity*, which refers to their promptness in facing problems. Higher levels of *spontaneity* were linked to higher levels of *individual agility*. These results are in line with the extant service OM literature, which states that these behaviors are key determinants of employees' ability to react and respond to unforeseen events or unpredictable circumstances (Secchi *et al.*, 2019).

The relationship between those two behaviors and individual agility could also be explained by the very nature of agility itself, which is defined by two components: innovative

work behavior and quickness (Braun *et al.*, 2017; Salmen and Festing, 2022). Thus, *creativity* could be viewed as a behavior supporting innovative work behaviors, where problems might have to be solved by thinking "outside the box" because the circumstances creating this problem fall outside normal operational considerations. For example, in densely populated and diverse urban areas, a triage nurse working in an emergency department may have to treat a patient that does not speak a language that she, or any other colleague, can understand, forcing her to think of creative ways to communicate with her patient. Another example of *creativity* could be related to having to reorganize one's work when one's unit is severely short-staffed, increasing the number of patients under the nurses' care without additional resources. Similarly, *spontaneity* could be viewed as a behavior supporting agility's need for *quickness*, especially when problems that arise risk creating detrimental effects if they are not dealt with promptly, such as patient care. For example, a nurse working in a cardiology department may have to take charge of a patient suddenly undergoing cardiac arrest while her colleague normally in charge of that patient is on break or is attending to another patient.

We further extend the microfoundations of dynamic capabilities theory by integrating voice theory which stems from the domain of OB (Detert and Edmondson, 2011; Morrison, 2023). Our results namely also show that voice-inhibiting cognitions impact nurses' creativity and spontaneity, as evidenced by IVTs' significant effects on these variables. This provides interesting insights into how voice theory may help explain individual behaviors supporting individual agility. While some of our hypotheses were invalidated, the overall negative impact of IVTs was made evident. First, all three IVTs had significant negative effects on *spontaneity*. This observation aligns with the literature on voice (Morrison, 2023). An IVT, by definition, restrains behavior (Detert and Edmondson, 2011). It represents a perceived risk, an unconscious effect that impacts an individual's behavior, because it channels the interpretation of one's context regarding the act of speaking up (Detert and Edmondson, 2011; Levy *et al.*, 2006).

On the other hand, only IVT-2 (i.e. feeling one can only speak up if one has complete data or solutions to offer) showed a significant negative effect on *creativity*. This negative effect of a voice-inhibiting cognition corresponds with findings from other researchers that have studied creativity (Zhou and George, 2001). According to Ng and Feldman (2012), voice behavior is significantly and positively associated with creativity. This has also been echoed by Chen and Hou (2016), who showed that employees that demonstrate voice behavior are usually viewed as highly creative by their managers. Nonetheless, the more generalized impact of IVTs 1, 2, and 3 on *spontaneity* contrasts with the more specific effect of only IVT-2 on *creativity*. Though they are not mutually exclusive, *creativity* and *spontaneity* are distinct behaviors with distinct nomological networks. *Spontaneity* relates, by definition, to the notions of quickness and immediate action, whereas *creativity* does not. In their work, nurses may be more often confronted with situations that require spontaneity (immediate action) as opposed to creativity. This may help explain why IVTs 1 and 3 did not impact *creativity*.

Zooming in on the salience of IVT-2 as an inhibitor of *creativity* and *spontaneity*, one possible explanation may reside in the professional culture of healthcare. Healthcare professionals are trained to act in close accordance with best practices supported by scientific evidence (Nembhard *et al.*, 2009) which may hinder *creativity* and *spontaneity*. These behaviors require that individuals craft solutions quickly (*spontaneity*), by going outside normal routines and procedures (*creativity*), which may involve some levels of risk and uncertainty. Because healthcare providers are trained not to deviate from documented best standards (Nembhard and Edmondson, 2006), solutions involving novel or undocumented ideas may result in IVT-2 having an influence on both of these behaviors, as shown here. The significant positive effect of the control variable *LNE* on IVT-2 shows that nurses with a higher level of education felt even more strongly that solid data or solutions were required in

order to speak-up. Though we did not hypothesize this effect, it is nonetheless interesting because it provides support for the salience of IVT-2. This result may be explained by the fact that nurses with higher levels of education are typically taught more advanced evidence-based nursing practices (Horntvedt *et al.*, 2018; Mackey and Bassendowski, 2017; Sin and Bliquez, 2017), thus reinforcing the professional culture that may already lead to higher levels of IVTs (Nembhard and Edmondson, 2006; Wu *et al.*, 2021). A higher LNE may also make nurses more aware of the fact that their data is incomplete, leading them to keep gathering data and information before speaking-up (Shepherd *et al.*, 2019). This could also be reinforced by nurses with a high LNE believing that colleagues and other higher-status stakeholders within the organization expect more sophisticated answers from them than from nurses with lower LNE. In other words, their status difference may enhance their self-censoring cognitions (Mannion and Davies, 2015; Nembhard and Edmondson, 2006).

While not initially hypothesized, the resulting direct effect of IVT-3 (i.e. the belief that speaking up could lead to negative consequences) on the perceived *quality of care* is also interesting. Albeit relatively small, this effect shows that high levels of perceived negative consequences from speaking-up are directly linked to lower perceived quality of care. For example, nurses might forego speaking-up about possible patient safety issues that they have witnessed for fear of being reprimanded, but which could help prevent adverse events (O'Donovan and McAuliffe, 2020). Future research may want to further explore this issue.

Finally, our findings also show relevant contingency effects. *Org-setting* showed significant effects on the *creativity* and *spontaneity* variables, where nurses working in hospitals showed slightly higher levels of *spontaneity* and nurses not working in hospitals showed slightly higher levels of *creativity*. Just to name a few, the non-hospital context included nurses working in medical clinics, long-term care facilities, and community service centers. This gap could be explained by the difference in environmental dynamism and uncertainty between the hospital context and the non-hospital context. Hospitals are highly volatile systems imbued with high levels of uncertainty (Fournier and Jobin, 2018), which may heighten the need for quick action (*spontaneity*) from clinicians. Non-hospital facilities such as long-term care facilities can more frequently be faced with challenges for which nurses need to craft solutions outside of normal routines due to resource scarcity. For example, during the Covid-19 pandemic, resources were often diverted from non-hospital entities towards hospitals that had to face an important number of patients battling Covid-19. This might have stimulated the importance for creativity from nurses in non-hospital settings in light of the scarcity of resources they may have faced. This is interesting given that dynamic capabilities theory is strongly tied to the resource-based view of the organization (Eisenhardt and Martin, 2000; Schilke *et al.*, 2018), meaning that scarcity of resources may be a trigger for nurses' creativity.

To summarize, our study answers the call from leading scholars to study OM-related phenomena in healthcare in light of the new reality caused by the Covid-19 pandemic (Alexander *et al.*, 2022; Micheli *et al.*, 2021). By combining frameworks from the OB and OM literature, this research offers a novel perspective on the individual agility of healthcare professionals by studying IVTs as determinants of workers' behaviors to creatively and spontaneously craft solutions to operational contingencies. While research on worker cognitions and behaviors related to OM capabilities has been growing in recent years (Fenner *et al.*, 2023; Franken *et al.*, 2021; van Dun and Wilderom, 2021), the effect of voice-inhibiting cognitions has not been studied. Since voice and silence can be key drivers of organizational change and performance (Morrison, 2023), studying the impact of their inhibitors in relation to behaviors that support dynamic capabilities is important. Thus, by combining voice theory (Detert and Edmondson, 2011; Morrison, 2023) with the microfoundational perspective of dynamic capabilities (Schilke *et al.*, 2018; van Dun and Wilderom, 2021), we are able to show that voice-inhibiting cognitions have a negative effect on individual behaviors that support

individual agility and, ultimately, a key aspect of worker performance in healthcare (quality of care). This advances our insights on the determinants of agility and further highlights the importance of micro-level factors in ultimately boosting organizational agility, which is a core aspect of contemporary healthcare operations.

6. Practical implications

This research also offers insights for healthcare organizations, at a time when they remain under pressure and must also look toward the "new-normal" (Alexander *et al.*, 2022). Unfortunately, healthcare organizations are notorious for being environments where workers feel unsafe about speaking up (Okuyama *et al.*, 2014), particularly towards their superiors (Leroy *et al.*, 2012; Nembhard and Edmondson, 2006). This fear of speaking up can lead employees to withhold information and knowledge, which are key for problem-solving (Furlan *et al.*, 2019; Gemmel *et al.*, 2019; Tucker and Edmondson, 2002), and evermore important in a highly uncertain environment like healthcare. We find that individual beliefs regarding speaking up can limit nurses' abilities to creatively and spontaneously solve problems and adapt to any given situation that might occur in such a volatile environment. Hence, organizations are advised to develop and nurture a culture where such voice is encouraged and valued. Even if organizations and managers have little control over employees' pre-held beliefs regarding voice (Detert and Edmondson, 2011), they can still enact solutions to counteract and reverse these beliefs by empowering workers through more relations-oriented leadership practices that support inclusivity and collaboration (Morrison, 2023; Tortorella *et al.*, 2020). In addition, leaders could ensure that team composition promotes an environment where leaders and workers show observable behaviors that contribute to nurses' feeling that it is safe to speak up, thereby alleviating the negative effects of employees' pre-held voice-inhibiting cognitions (O'Donovan *et al.*, 2020). Finally, implementing action-based learning interventions or trainings might also create a more favorable climate for speaking up and being creative (Kristensen *et al.*, 2022), which will help overcome nurses' implicit theories that keep them from speaking up.

Our findings may also have important practical implications in light of the digital transformation of healthcare which has gained more and more traction in recent years (Al-Jaroodi *et al.*, 2020). This change was accelerated due to the Covid-19 pandemic which has created significant challenges for healthcare managers and clinicians (Sony *et al.*, 2023). Because this transformation has become essential for healthcare organizations to keep providing sustainable care (Al-Jaroodi *et al.*, 2020), managers and decision-makers must pay close attention to the behavioral and cognitive aspects related to it (Jose *et al.*, 2022; van Dun and Kumar, 2023). Notably, researchers have identified *creativity* as a key competency of healthcare professionals for adopting Industry 4.0 technologies (Anyanwu *et al.*, 2021; Buchelt *et al.*, 2020; Karahanna *et al.*, 2019). Our findings show that *creativity* is also an important driver of individual agility. Additionally, out of the three IVTs that we studied, the second one which is related to the completeness of the data and solutions, may be the most important as it relates to digital transformation. While digital transformation can facilitate access and use of data for problem-solving (Akter *et al.*, 2016; Wamba *et al.*, 2015), the abundance of data may also reinforce the belief that more data needs to be accessed before being certain about a possible countermeasure, which is problematic when workers need to adapt to their ever-changing environment. Also, healthcare professionals might not always have access to the right data or, given the high environmental dynamism, at the right point in time. Thus, especially when healthcare organizations aim to increase their organizational agility by adopting smart technologies, the implementation plan should seriously address the counterintuitive effects that voice-inhibiting cognitions may have on their clinicians and train

them how to deal with large volumes of data to support their decision making in light of their fast-paced environment.

7. Strengths, limitations and future research

The large sample size used to test our theoretical model heightens the external validity of our research and contributes to its generalizability. Our sample size also represents a strength due to the notorious difficulty of collecting large-scale survey data from healthcare professionals (McLeod *et al.*, 2013), which was also compounded by the Covid-19 pandemic. However, future research would benefit from including other types of professionals, notably physicians, for whom results may differ from nurses. Because our study was conducted with Canadian nurses, the generalizability of our findings to other healthcare systems may prove imperfect. Although the Canadian healthcare system shares strong similarities with other public healthcare systems from countries such as the United Kingdom (Burgess and Radnor, 2012) and Ireland (O'Donovan and McAuliffe, 2020), data from other countries may help account for differences across individuals working in private versus public organizations or individuals working in different socioeconomic contexts. For example, working in public healthcare systems may reduce the barriers for someone to speak up due to the prevalence of unions and job tenure (Morrison, 2011).

Surveys can be vulnerable to self-report bias and low response rates (Donaldson and Grant-Vallone, 2002), though our large representative sample and validation procedure help alleviate this issue. Cross-sectional surveys can also create issues related to common method variance and endogeneity (Guide and Ketokivi, 2015; Podsakoff *et al.*, 2012). While our validation procedure did not reveal any evidence for these two issues, future research could benefit from a longitudinal perspective combined with secondary data. Our study also focused on perceived quality of care as a proxy for individual performance in healthcare. This measure could be complemented with secondary data on quality of care and patient satisfaction. Also, while quality of care represents an important dimension of performance, it is not the only one (Bodenheimer and Sinsky, 2014; Nundy *et al.*, 2022), and future research may want to broaden the scope and assess other measures of individual performance such as accessibility or efficiency.

Our study focused on creativity and spontaneity as determinants of individual-level agility. Future research could explore other previously identified antecedents of employee agility (Salmen and Festing, 2022). Also, because our study was done at the individual level, our findings are not extended to the unit or team level. Since recent OM research has highlighted the importance of team-level factors in the development of dynamic capabilities (van Dun and Wilderom, 2021), additional contingency factors related to the organization or department could be added as moderators to our model. Future research could also be done through a multi-level lens by looking at how individual behaviors contribute to team-level agility or how team-level agility contributes to individual behaviors. These new data could prove interesting, especially in light of recent findings suggesting that team efficacy may have improved during the pandemic (Hoff and Neff, 2023; Klonek *et al.*, 2022), and may also shed light on the post-pandemic "new normal" of healthcare organizations.

IVTs are part of the wider nomological network that studies how organizations innovate and learn (Edmondson and Lei, 2014). Thus, future research on how organizations can develop and sustain agile capabilities could also focus on other cognitive and behavioral constructs that relate to IVTs, such as leadership behaviors, commitment or trust. For example, a recent study has linked lean implementation with psychological safety and learning within teams (Fenner *et al.*, 2023). Though psychological safety was not included in our conceptual model, evidence suggests that IVTs are related to it (Edmondson and Lei, 2014). Thus, we suggest that future

research could include this concept because it may also prove important to explain individual cognitions and behaviors that lead to agility.

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