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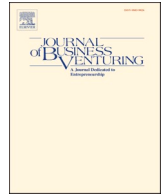
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“I can't get it out of my mind” - Why, how, and when crisis rumination leads entrepreneurs to act and pivot during crises

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ABSTRACT

Why do some entrepreneurs pivot their business models in a crisis, while others are more passive? Integrating Conservation of Resources theory with work on crisis rumination, we developed a micro-level model to explain why entrepreneurs who are under strain due to a crisis, as indicated by experiencing crisis rumination, adopt an active approach – i.e., using active coping and engaging in pivoting. Moreover, prevention-focused entrepreneurs who are habitually more sensitive to losses are especially stimulated by crisis rumination to pivot to prevent (further) resource losses. We tested our model in an experiment and an eight-month longitudinal study with entrepreneurs during an inflation crisis.

Executive summary

Sam replays over and over in his head a tense conversation he had with his co-founder, Jason. He is worried about how to adjust production to deal with the persistently high rate of inflation, which has increased their costs of doing business to unprecedented levels. Similarly, Jason cannot stop thinking about the downward trend in sales in their business caused by customers cutting back spending due to the cost-of-living crisis also caused by the persistently high rate of inflation. Like Sam, he is anxious about the impact on his business and, in turn, his family, because the business is an important source of household income. Although Sam and Jason are aware that their thoughts are excessively intrusive, they cannot prevent themselves from worrying. In short, they are ruminating about the ongoing inflation crisis.

How might entrepreneurs like Sam and Jason react to the inflation crisis? Will they proactively change their business models or will they take a more passive “wait-and-see” approach?

In this article, we report on the development of a micro-level model anchored in psychological stress theories. The model aims to

Abbreviations: CISS, Coping Inventory for Stressful Situations; COR, Conservation of Resources; LSBS, Longitudinal Small Business Survey; ONS, Office for National Statistics; VIF, Variance Inflation Factor.

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explain the reactions of entrepreneurs like Sam and Jason to a crisis and to understand why certain entrepreneurs take a more active or passive approach when navigating a crisis. Specifically, our model integrates the Conservation of Resources (COR) theory with research on crisis rumination and considers that crises are distinct stressors. While everyday stressors are often transient, demanding short-term cognitive attention and resource allocation, crises, such as the inflation crisis that Sam and Jason are experiencing, unfold over several months, necessitating sustained cognitive attention and resource allocation. These crises threaten and deplete entrepreneurs' resources and can trigger crisis rumination or negative repetitive thoughts about a crisis that involve anxiety.

Our model suggests that when entrepreneurs are experiencing higher levels of strain during a crisis, as evidenced by their engagement in crisis rumination, they tend to take a more active approach to the crisis, individually using active coping and pivoting (i. e., fundamentally changing) their business. We suggest that crisis rumination motivates entrepreneurs and supplies them with the necessary energy to take action to mitigate further resource losses. Moreover, the process of strain-induced action is particularly pronounced for entrepreneurs who are inherently more sensitive to threats and losses, such as those with a regulatory focus oriented toward prevention. Our predictions were supported by the results of an experiment and an eight-month longitudinal study conducted with samples of UK entrepreneurs during the 2022 inflation (cost-of-living) crisis.

Our research contributes to the literature on crisis and entrepreneurship by introducing a stress-based micro-level model that explains why and how certain entrepreneurs, experiencing strain during a crisis, will take a more active (vs. a wait-and-see) approach. The study advances emerging research on entrepreneurs' rumination and further enhances understanding of the drivers of pivoting. Our findings also have implications for the regulatory focus theory in entrepreneurship.

1. Introduction

Crises are low-probability, high-impact situations that generate uncertainty and adversity as they unfold (e.g., Pearson and Clair, 1998; Williams et al., 2017). Predicted increases in crises such as health pandemics, natural disasters, global recessions, and inflation (Mithani, 2020; Phan and Wood, 2020) emphasize the need to understand how entrepreneurs navigate them (Batjargal et al., 2023; Shepherd, 2020). This is important because entrepreneurs and small businesses are the backbone of the economy. For instance, in the UK, they account for 99.2 % of the total business sector and provide about 61 % of employment and 51 % of turnover (UK Government, 2022). They are also especially likely to suffer during crises due to resource constraints (e.g., Gorden, 2023; Cumming, 2023). While the Covid-19 pandemic has accelerated research on entrepreneurship during crises, it remains an emerging research area.

The emerging entrepreneurship research shows that entrepreneurs respond to crises in different ways, ranging from acting with agility and changing their entire business model (pivoting, cf. Snihur and Clarysse, 2022) to adopting a "wait-and-see" approach that conserves their business resources (e.g., Thorgren and Williams, 2020; Kuckertz et al., 2020; Manolova et al., 2020; Stephan et al., 2023). This research also indicates that crises are significant personal stressors for entrepreneurs, negatively impacting their well-being (Caliendo et al., 2022; Patel and Rietveld, 2020). Engaging in strategic entrepreneurial actions can help entrepreneurs safeguard their well-being during crises by helping them regain a sense of control and reduce stress (e.g., Stephan et al., 2023; Williams and Shepherd, 2016). Strategic entrepreneurial actions such as pivoting are also argued to help entrepreneurs thrive in crises by enabling them to adapt their business to the changed crisis environment and quickly exploit newly emerging opportunities (Manolova et al., 2020; Miklian and Hoelscher, 2022). However, the strain induced by a crisis is known to increase individuals' cognitive and behavioral rigidity (see the threat-rigidity theory, Staw et al., 1981), thereby inhibiting strategic entrepreneurial actions (Rauch et al., 2018; Stephan, 2018). Thus, existing research cannot explain why and how certain entrepreneurs under strain because of a crisis may take a more active approach.

In this paper, we draw on psychological theory on stress-induced rumination (Nikolova et al., 2021; Nolen-Hoeksema and Morrow, 1991) and integrate it with the Conservation of Resources (COR) theory, which is a motivational stress theory (Hobfoll, 1989; Hobfoll et al., 2018). We aim to develop a theoretical framework that explains why and how certain entrepreneurs adopt a more active approach to navigating an ongoing crisis. Specifically, we consider entrepreneurs who use active coping individually and engage in pivoting in the business as taking an active approach.

Psychological research has documented that stressful events can induce individuals to think and worry about them persistently. Such events trigger rumination, which entails negative repetitive thoughts that often involve negative feelings such as anxiety (Jones et al., 2013; Lyubomirsky and Nolen-Hoeksema, 1993). Rumination prolongs the negative impacts of a stressful event by exacerbating strain, including negative emotions and the physiological stress response (Nolen-Hoeksema and Morrow, 1991; Watkins and Roberts, 2020). Consistent with the findings from psychological research, emerging entrepreneurship research on rumination has also found that such rumination negatively impacts entrepreneurs' well-being (Yang et al., 2021; Wach et al., 2021).¹ This stream of research typically studies entrepreneurs' rumination in response to everyday stressors. In contrast, crises are longer-term stressors that are more pervasive, overwhelming, and entail greater uncertainty than everyday stressors (Doern et al., 2019), requiring long-term cognitive attention and resource expenditure. In turn, rumination about a crisis (crisis rumination for short) can be more intense and enduring than rumination about everyday stressors. For instance, crisis rumination has been found to have more pronounced negative effects on entrepreneurs' well-being than "everyday stressor" rumination (Battisti et al., 2022).

How then may the experience of crisis rumination translate into entrepreneurs adopting a more active approach during crises? COR theory (Hobfoll, 1989; Hobfoll et al., 2018) provides a theoretical scaffold to understand why and how certain entrepreneurs may

¹ Entrepreneurship research has also investigated other types of rumination, e.g., problem-solving pondering, that are affect neutral and do not involve anxiety. We consider this research in more detail in Section 2.2.

respond to the aversive experience of crisis rumination with active coping and pivoting. COR highlights that individuals are sensitive to (the threat of) resource losses and motivated to minimize such losses. They can do so by adopting either a defensive resource-conservation (wait-and-see) approach or an exploration approach in which they “search for alternative survival or adaptation strategies” (Hobfoll et al., 2018: 106), such as active coping and pivoting. The pressure to take action intensifies with the duration and severity of (the threat of) resource loss. Crises present particularly intense threats of resource loss; they cause actual losses for entrepreneurs who tend to be resource constrained (Doern et al., 2019) and for whom the business is part of “who they are” (Cardon et al., 2009). Hence, the longer a crisis lasts, the greater the threat to and strain on entrepreneurs' financial, physical, and psychological resources, which manifests psychologically in entrepreneurs' crisis rumination. Engaging in crisis rumination consumes further psychological resources, increasing the pressure on entrepreneurs to find alternative strategies (for example, active coping and pivoting) to mitigate resource losses and free themselves from crisis rumination.

These processes are likely intensified—that is, crisis rumination is more likely to lead to an active approach (active coping and pivoting)—for entrepreneurs who are habitually more sensitive to threat and resource loss, such as entrepreneurs high in trait prevention (relative to promotion) focus. Trait prevention focus is a self-regulation style characterized by heightened attention to potential losses, loss aversion, and sensitivity to threats (Higgins, 1998; Brockner et al., 2004). While prior research typically links low levels of strain (e.g., Stephan, 2018) and promotion focus (e.g., Kammerlander et al., 2015) to more expansive action by entrepreneurs, we build on COR to propose that during an ongoing crisis, high levels of crisis rumination as an indicator of crisis-induced strain lead entrepreneurs to engage in more active coping and pivoting, especially when they are habitually prevention focused and therefore especially sensitive to the (threat of) resource loss during crisis.

Testing our model, we found support for it across two studies—an experiment and a longitudinal survey—with entrepreneurs running small businesses in the UK during the cost-of-living (inflation) crisis. The UK is an advanced economy that has experienced an especially severe inflation crisis (UK House of Commons, 2023). Inflation began to rise in mid-2021, peaked in October 2022, and was still at 6% to 7% in Fall 2023. The combination of an experiment and a longitudinal study ensures the internal and external validity of our findings.

Our research makes the following contributions. *First*, we advance emerging research on crisis and entrepreneurship (e.g., Batjargal et al., 2023; Belitski et al., 2022; Newman et al., 2022) by leveraging psychological stress theories—COR theory (Hobfoll, 1989) and crisis rumination (Nikolova et al., 2021)—to develop a micro-level model that explains how entrepreneurs navigate crisis with a more active (vs. a more passive wait-and-see) approach. This extends existing research by offering a new explanation and micro-level model to predict and support entrepreneurs' responses to crises. In the context of crisis, our model explains how a stressful experience (captured by crisis rumination) that would typically be expected to lead to more rigidity (Rauch et al., 2018; Staw et al., 1981) can counterintuitively translate into expansive action (pivoting). We further identify the types of entrepreneurs (those with a high prevention focus) for whom this outcome is particularly likely. We also outline and discuss the implications of our findings for COR theory (Hobfoll, 1989).

Second, our study contributes to the emerging research on entrepreneurs' rumination, which focuses on everyday stressors (e.g., Soenen et al., 2019; Wach et al., 2021; Yang et al., 2021; Battisti et al., 2022 for an exception), by establishing rumination as an important micro-level mechanism to capture the psychological impact of macro-level systemic stressors like crises. Further, by theorizing how crisis rumination shapes *entrepreneurial action*, our study expands the scope of research on rumination by linking it to new outcomes (active coping and pivoting). This extends entrepreneurship and recovery research on rumination beyond its focus on well-being (Soenen et al., 2019; Wach et al., 2021; Yang et al., 2021; Wendsche and Lohmann-Haislah, 2017).

Third, our research contributes to the understanding of entrepreneurs' pivoting (Chaparro and Gomes, 2021) by identifying new psychological antecedents of pivoting: the stress-related micro-level processes of crisis rumination and active coping. This complements existing research on pivoting (Chaparro and Gomes, 2021) which has focused on the consequences of pivoting for entrepreneurs' passion, their own and their firm's identity, and stakeholder relationships (Grimes, 2018; Berends et al., 2021; Hampel et al., 2020; McMullen, 2017; Snihur and Clarysse, 2022). Past research also highlights that pivoting can optimize venture performance (Pillai et al., 2020; Kirtley and O'Mahony, 2020). Our study complements this by newly theorizing a psychological stress-related process as a driver of pivoting, that is, pivoting out of necessity to manage entrepreneur strain and mitigate resource losses in a crisis.

Finally, we contribute to research on entrepreneurs' regulatory focus that mainly explores the direct positive effects of promotion focus on strategic entrepreneurial actions and performance (Tumasjan and Braun, 2012; Brockner et al., 2004). Our research offers a stress-based theoretical explanation anchored in COR (Hobfoll et al., 2018) to theorize how prevention focus can help to spur entrepreneurs to action during a crisis by intensifying the effects of crisis rumination. Our findings thus highlight the important moderating effect of prevention focus and of examining entrepreneurs' regulatory focus in relation to the context (i.e., a crisis).

2. Theoretical background and hypotheses

2.1. Crises and stress: A conservation of resources (COR) perspective

Entrepreneurship is a stressful career. Research has documented high levels of specific stressors related to entrepreneurs' work, social relationships, and financial resources (e.g., Cardon et al., 2009; Kollmann et al., 2019; Wach et al., 2021), drawing on theories such as role stress, the challenge and hindrance stress framework, and job demand resources theory (see Lerman et al., 2021; Stephan, 2018 for reviews). More recently, researchers have begun to investigate crises as stressors, focusing on natural disasters (e.g., Williams and Shepherd, 2016) and the Covid-19 pandemic (Caliendo et al., 2022; Stephan et al., 2023). Crises can exacerbate, often for an extended period, the severity of entrepreneurial stressors such as workload, uncertainty, loneliness, and financial constraints. A

particularly useful theory to understand such complex and longer-term stress situations is COR theory.

COR considers that stressful conditions are made up of sequences of stressful events that occur over time (Hobfoll et al., 2018: 105) and which are psychologically straining because they threaten resources, cause actual resource loss, or undermine attempts to gain resources (Hobfoll, 1989: 516). Thus, viewing crises as stressors through the lens of COR helps to understand the nature of crises as high-impact macro-level events (Williams and Shepherd, 2016; Pearson and Clair, 1998) or “collective stress situations[s]” (Doern et al., 2019) that have multiple interlinked and longer-term negative effects on entrepreneurs that unfold over time. Unlike everyday stressors, crises unfold over a longer time period and demand long-term cognitive attention and resource expenditure. For instance, the Covid-19 pandemic, recessions, and inflation crises unfolded over months or years, and it takes many years to deal with the consequences of natural or industrial disasters (e.g., earthquakes or the Chernobyl nuclear disaster). For entrepreneurs, crises are particularly intense and threatening stressors (Stephan et al., 2023; Batjargal et al., 2023) because they are often resource constrained even before a crisis (Doern et al., 2019). Additionally, their businesses typically constitute a significant part of their family incomes (Berrill et al., 2021) and identities (Cardon et al., 2009).

According to COR, all individuals actively seek to create a world that provides them with pleasure and success (Hobfoll, 1989: 516). Achieving these goals requires resources, which are broadly defined by Hobfoll (1989) as comprising physical objects, personal characteristics, conditions, and energies that are valued by individuals or that serve as a means for the attainment of these objects, personal characteristics, conditions, or energies. A situation is not inherently stressful; it becomes so only when a (threat of) resource loss becomes apparent (Hobfoll, 1989). Individuals typically react to stressful situations either by using their residual resources to restore lost resources or obtain new ones, or by withdrawing their efforts to conserve resources (Halbesleben and Buckley, 2004; Kiazad et al., 2014; Ng and Feldman, 2012). The latter aligns with work on threat rigidity (Staw et al., 1981) and theorizing on stress in entrepreneurship (Rauch et al., 2018) that emphasizes resource conservation in response to crises and stressors, consistent with a wait-and-see approach.

COR further posits that “when people’s resources are overstretched or exhausted,” for instance when they have been strained by extended periods of (threats of) resource loss such as during a longer-term ongoing crisis, “individuals enter a defensive mode to preserve the self” (Hobfoll et al., 2018: 106). In this defensive mode, individuals may conserve resources or start to explore and “search for alternative survival or adaptation strategies” (Hobfoll et al., 2018: 106). Thus, according to COR, entrepreneurs may react to crises with either a passive wait-and-see approach or an active approach such as active coping and pivoting. However, COR offers little guidance on why and how certain individuals living through a crisis opt for a particular approach.

In this study, we investigate how entrepreneurs navigate an ongoing prolonged crisis, providing a micro-level model and stress-based theorizing to explain why and how certain entrepreneurs mobilize an active approach (including active coping and, in turn, pivoting of the business). Our starting point is to consider the entrepreneurs’ cognitive-emotional strain reaction to a crisis. We suggest that this strain reaction—the psychological impact of the crisis as a stressor—is reflected in the intensity of entrepreneurs’ crisis rumination. We also theorize the moderating role of prevention focus as a trait reflecting individual differences in sensitivity to (threat of) resource loss. Fig. 1 gives an overview of our theoretical framework.

2.2. Entrepreneurs’ rumination and crisis rumination

Emerging entrepreneurship research on rumination is informed by research on recovery from work stress (Cropley and Zijlstra, 2011; Sonnentag et al., 2021) and thus typically considers *everyday* stressors but not macro-level systemic stressors like crises (Battisti et al., 2022, for an exception). Specifically, existing research distinguishes three types of rumination as stressor-induced psychological states reflecting how people think about their work and work-related stressors (Cropley and Zijlstra, 2011; Querstret and Cropley, 2012). *Affective rumination* entails negative repetitive thoughts about work accompanied by negative emotions. *Detachment* refers to how easy people find it to switch off and not think about work (stressors). *Problem-solving pondering* is an emotionally neutral and more productive form of ruminating that includes reflecting on work-related issues when not at work. Increased affective rumination and

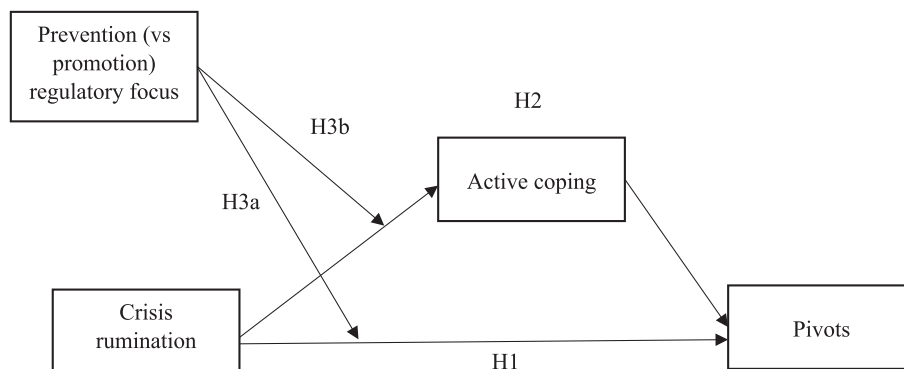


Fig. 1. Research model.

Note. H4 tests a moderated mediation effect combining the predictions of H1, H2 and H3a, H3b.

lack of detachment are typically associated with a low sense of well-being as they prolong the negative effects of work stressors and impair the recovery processes through which individuals restore the psychological resources expended on dealing with work stressors (Junker et al., 2021; Kinnunen et al., 2019; Querstret and Cropley, 2012). Consequently, research on entrepreneurs' rumination has found that affective rumination and lack of detachment negatively impact entrepreneurs' well-being (Wach et al., 2021; Yang et al., 2021; Soenen et al., 2019), while problem-solving pondering has mixed (positive or negative depending on the study) effects on well-being (Wach et al., 2021; Yang et al., 2021) and can enhance entrepreneurs' daily creativity (Weinberger et al., 2018).

Crises as significant and widespread macro stressors over which individuals have little control are typically experienced as “unsolvable and overpowering” because “the stressor exceeds one's capacity to overcome it” (Nikolova et al., 2021: 1169). Therefore, crisis rumination encompasses affective rumination and lack of detachment, including anxiety and worry in the form of anticipatory negative thoughts and emotions about the potential detrimental impacts of the crisis on the individual (Nikolova et al., 2021). As such, crisis rumination may be more intrusive and obsessive than the rumination related to everyday stressors and thus may have more pronounced effects. This supposition was supported in a longitudinal study showing that crisis rumination (about the Covid-19 pandemic) had more pronounced negative effects on entrepreneurs' well-being than their “everyday-stressor” rumination (Battisti et al., 2022). Indeed, entrepreneurs' crisis rumination was found to crowd out the effects of rumination about everyday work stressors (Battisti et al., 2022). This suggests that crisis rumination is an important psychological, micro-level stress mechanism reflecting how under strain entrepreneurs feel by a crisis.

We argue that intense crisis rumination can mobilize entrepreneurs to explore active approaches, including active coping and pivoting. This is because crisis rumination cognitively signals to entrepreneurs that their current situation is problematic (Martin and Tesser, 2006) and that further efforts are required to solve it (Verhaeghen et al., 2005). Moreover, the anxiety associated with crisis rumination can help to energize entrepreneurs' actions (Eysenck and Calvo, 1992). Crisis rumination therefore may have the power to mobilize the search for solutions (e.g., active coping, pivoting) that can mitigate resource losses in a crisis. In the next section, we discuss how entrepreneurs' crisis rumination can lead to pivoting.

2.3. *Entrepreneurs' crisis rumination as a determinant of pivoting*

Pivoting is a relatively new concept in entrepreneurship research (Grimes, 2018; Hampel et al., 2020). In a recent systematic review of pivoting research, Chaparro and Gomes (2021) propose that a change in business model constitutes the essential nature of pivoting. We subscribe to the definition of pivoting proposed by Snihur and Clarysse (2022: 3), who conceptualize pivoting “as a substantive transformation of the company's business model to create or maintain competitive advantage.” According to George and Bock (2011: 99), a business model is a “design of organizational structures to enact a commercial opportunity” that has three general dimensions: resources (e.g., companies' assets and entrepreneurs' skills), transactions (e.g., methods of buying and selling), and values (e.g., profitability and market shares). Hence, building upon the ideas of Snihur and Clarysse (2022) and George and Bock (2011), we conceptualize pivoting as a substantive transformation of a company's business model components (including resources, transactions, and values) to create or maintain competitive advantage.

Most research on pivoting has focused on new venture development (Burnell et al., 2023; Grimes, 2018; Snihur and Clarysse, 2022), but our focus is on the pivoting of an existing business. While pivoting in new venture development involves testing hypotheses about the business model, pivoting in existing businesses involves transformations to a “real entity” (cf. Massa et al., 2017).

Recently, pivoting has been argued to be important for entrepreneurs as they lead their businesses through crises (Morgan et al., 2020), although empirical research has yet to be conducted. In a crisis, entrepreneurs tend to face significant resource losses or even business failure if they do not rearrange their business's resource structures, find new transaction methods, or adjust or find new value propositions. Because of their low resource levels, competitiveness constraints, and low market share, they typically do not have the resource slack to “wait out” crises (Batjargal et al., 2023; Doern et al., 2019). Nevertheless, and as noted in the introduction, research on entrepreneurs and small businesses during crises suggests that only some choose active approaches and make changes to their business, with others remaining more passive.

Building on and integrating COR theory and crisis rumination research, we suggest that entrepreneurs will pivot more when they are under strain due to a crisis, as indicated by higher levels of crisis rumination. Recall that COR suggests that when individuals are enduring ongoing crises in “defensive mode,” they may start to actively search for an adaptation strategy or passively conserve their resources (Hobfoll et al., 2018). We argue that high levels of crisis rumination motivate and energize entrepreneurs to opt for a more active approach by pivoting their business model to adapt it to the changed crisis context.

Rumination is a resource-consuming process that is experienced as aversive, and it can be stopped by “doing something” to remove the source of rumination. Crisis rumination consumes entrepreneurs' cognitive and emotional resources because the entrepreneur is thinking repeatedly about the potential negative impacts of the crisis on their business and themselves, experiencing worry and anxiety while doing so (Battisti et al., 2022). Rumination only ceases and stops draining cognitive and emotional resources when individuals address the discrepancy that gives rise to rumination in the first instance (Wang et al., 2013; Jones et al., 2013). While entrepreneurs have no control over a crisis, engaging in pivoting can help them prevent further resource loss through reasserting their sense of control (a psychological resource) and mitigating resource losses in their business (the more proximal trigger of their rumination). At the same time, the anxiety about potential losses that is part of crisis rumination (Nikolova et al., 2021) can enable pivoting because the function of anxiety is to focus attention on and energize action, including through physiological energy mobilization (Eysenck and Calvo, 1992; Averill, 2015). Thus, pivoting could be a solution for entrepreneurs in a crisis (Shepherd, 2020; Manolova et al., 2020). Indeed, a study during the Covid-19 crisis suggested that entrepreneurs managed to safeguard their well-being by searching for new business opportunities which helped them to “focus their attention on the aspects of their current situation that they can change, thereby regaining

a sense of control” (Stephan et al., 2023: 690). Similarly, Williams and Shepherd (2016) showed that starting a business during a crisis can help victims of disasters cope by strengthening their lost personal agency (a psychological resource) and generating physical resources.

Therefore, we propose that the more entrepreneurs engage in crisis rumination, the more they are motivated and energized to adopt an active approach to address the (threat of) resource losses during a crisis. In other words, crisis rumination leads to the formation and execution of pivoting. Thus,

H1. Entrepreneurs' crisis rumination is positively associated with pivoting.

2.4. *The mediating effect of active coping*

We propose that entrepreneurs' crisis rumination is linked to pivoting their business through the individual-level mechanism of active coping. Active coping, also known as problem-focused or task-oriented coping, describes individuals' thoughts and actions through which they “do something” to alter a stressful situation (Uy et al., 2013: 585). It has both cognitive and behavioral elements (Uy et al., 2013) and is aimed at generating potential solutions to a stressful situation and making and executing a plan of action (Nikolaev et al., 2022; Patzelt and Shepherd, 2011). Entrepreneurship research has started to explore and provide empirical support for the positive effects of active coping on entrepreneurs' well-being (Nikolaev et al., 2022; Uy et al., 2013). However, we still know little about the antecedents of active coping and its consequences for strategic entrepreneurial actions such as pivoting.

Drawing on COR theory and crisis rumination research, we suggest that active coping mediates the effect of entrepreneurs' crisis rumination on pivoting. That is, crisis rumination is a driver of active coping, for much the same reasons that crisis rumination is a driver of pivoting. Crisis rumination can motivate and energize entrepreneurs to engage in active coping. It is an aversive process that consumes entrepreneurs' psychological (cognitive and emotional) resources as they repeatedly think and worry about the effects of the crisis, including the (threat of) resource loss for themselves, their family, and their business. Active coping offers a way for the entrepreneur to do something to remedy the situation and prevent further resource loss; that is, they adapt to the crisis. Moreover, the anxiety associated with crisis rumination provides the entrepreneur with the energetic resources to focus their attention, thinking, and action on possible ways to alter the stressful situation. In other words, crisis rumination can help energize efforts to contemplate and execute strategies that help prevent (further) resource losses. Besides evidence that entrepreneurs' anxiety can instigate action (Cacciotti et al., 2016; Foo et al., 2009), there is also evidence that anxiety can increase creative thinking (Dreu et al., 2008) and engagement in innovative work behavior (Montani et al., 2018; Frijda, 1986) which are elements of active coping. In sum, crisis rumination facilitates entrepreneurs' engagement in active coping, i.e., thinking about, searching for, and executing ways of mitigating the impacts of the crisis on themselves and their business.

Active coping is likely to be a driver of entrepreneurs' increased pivot engagement for two reasons. First, it involves thinking about and searching for possible ways to mitigate the impact of the crisis on the entrepreneur and their business, thereby facilitating entrepreneurs' understanding of their environment, business, and capabilities and resources (Pathak and Goltz, 2021; Uy et al., 2013). The result of this cognitive process is more effective judgment of the situation (Foss et al., 2019) and the generation of possible adaptive strategies to the crisis to address the (threat of) resource losses. Second, active coping enables productive actions, such as the generation and execution of a set of strategic steps aimed at addressing the stressful situation (Uy et al., 2013). The result of this behavioral process is the implementation of a well-considered plan of change-effecting actions (Keating et al., 2014), including changes to the business model through pivoting. As such, we propose:

H2. Active coping mediates the effect of entrepreneurs' crisis rumination on pivoting.

2.5. *The moderating effect of entrepreneurs' trait regulatory focus*

Why do some entrepreneurs engage in active coping and pivoting during crisis, while others do not? So far, we have addressed this question to an extent by drawing on COR theory and crisis rumination research to theorize that entrepreneurs who experience more crisis rumination are more motivated and energized to act (i.e., they engage in active coping and pivoting) to prevent further resource losses. However entrepreneurs are not equally motivated to prevent resource losses (Brockner et al., 2004). Some entrepreneurs are habitually sensitive to loss and the threat of loss because their regulatory focus trait is one of prevention. They are more likely to be stimulated by crisis rumination to engage in active coping and pivoting compared with entrepreneurs who have lower sensitivity to losses. Therefore, we investigate entrepreneurs' trait regulatory focus as a moderator in the relationship between crisis rumination and active coping/pivoting.

Regulatory focus theory (Higgins, 1998; Higgins, 1997) proposes that individuals have distinct motivational orientations focused on either prevention or promotion. These orientations determine the nature of individuals' goals and the strategies they use to achieve them. Individuals with a strong trait prevention focus are sensitive to potential losses and threats; they value security and have heightened loss aversion (Higgins, 1997; Higgins, 1998; Brockner et al., 2004; Idson et al., 2000). In contrast, individuals with a strong trait promotion focus are sensitive to gains; they concentrate on achieving growth-related goals, opportunities, and aspirations (Higgins, 1998; Higgins and Tykocinski, 1992). While prevention-focused individuals prioritize loss avoidance and safety, promotion-focused individuals are motivated by aspirations.

Crisis rumination makes (the threat of future) resource losses salient to entrepreneurs. Additionally, crisis rumination consumes entrepreneurs' cognitive and emotional resources; it thus incurs losses of psychological resources. This is why entrepreneurs are motivated and energized to mitigate crisis rumination through engaging in active coping and pivoting. The link between crisis

rumination and such actions should be stronger for prevention- (relative to promotion-) focused entrepreneurs because prevention-focused entrepreneurs are more sensitive to resource losses and more motivated to protect resources. There is evidence that when prevention-focused individuals identify that the default avoidance option requires action, they are more likely to act than promotion-focused individuals (Ciuchta et al., 2016). Conversely, promotion-focused entrepreneurs may decide to wait out the crisis (Scholer and Higgins, 2012) until the most significant uncertainty has passed and growth and gain opportunities become apparent once more.

Therefore, we posit that crisis rumination interacts with entrepreneurs' trait prevention focus to positively affect their active coping and pivoting. This leads to the following moderation hypotheses:

H3a. Entrepreneurs' trait regulatory focus moderates the relationship between entrepreneurs' crisis rumination and pivoting, such that this positive association is strengthened for prevention-focused (relative to promotion-focused) entrepreneurs.

H3b. Entrepreneurs' trait regulatory focus moderates the relationship between entrepreneurs' crisis rumination and active coping, such that this positive association is strengthened for prevention-focused relative to promotion-focused) entrepreneurs.

Taken together, our hypotheses and model (Fig. 1) imply a moderated mediation effect in which the indirect effect of crisis rumination on pivoting through active coping is stronger for entrepreneurs with a high trait prevention focus. Thus,

H4. Entrepreneurs' trait regulatory focus moderates the indirect relationship between entrepreneurs' crisis rumination and pivoting via active coping, such that this positive association is strengthened for prevention-focused entrepreneurs relative to promotion-focused entrepreneurs.

3. Methods

We conducted two complementary studies to test our research framework: an experiment (Study 1) and a longitudinal survey (Study 2), both with UK entrepreneurs. The advantage of the experimental study is its internal validity. Randomly assigning entrepreneurs into treatment (crisis rumination) and control groups and experimentally manipulating crisis rumination helped us establish the causal effect of crisis rumination on active coping and pivoting. However, experiments have limited external validity, and the pivoting actions in Study 1 are necessarily hypothetical instead of actual behaviors. To address these shortcomings, we conducted an eight-month longitudinal field study with a further sample of UK entrepreneurs. Specifically, we measured entrepreneurs' actual crisis ruminations in December 2022 and July 2023, linking the increase/decrease in their levels of crisis rumination to the pivoting actions undertaken by the entrepreneur in this time period. Before presenting the studies in detail, we will elaborate on the context of our study: the UK inflation crisis.

3.1. Empirical setting: The UK inflation crisis

We test our hypotheses in the context of the inflation crisis in the UK, also termed the “cost of living” crisis (ONS, 2023), which was still ongoing at the time of writing in Fall 2023. Inflation is an increase in the prices of goods and services. It reduces the spending power of consumers and businesses while also altering the value and structure of a business's existing resource stocks; this subsequently affects firm performance (Minihan, 1976; Ryans, 1983). The global inflation crisis began in March 2022 in the wake of the Covid-19 pandemic with its high death rates and economic slowdown (Stephan et al., 2023; Torrès et al., 2022), and it was exacerbated by a sharp increase in energy and food prices resulting from Russia's invasion of Ukraine (ONS, 2023). Among the advanced economies, the UK experienced the highest rates of inflation. This is partly because its economy was already suppressed due to Brexit, and because of the government instability and resulting market volatility that occurred in Fall 2022 (Library, 2023). The UK Consumer Price Index (CPI)—a key measure of inflation—increased significantly from mid-2021 and peaked in late 2022, reaching a 40-year high of 11.1 % in October 2022 (ONS, 2022a, 2022b). Although inflation affects all businesses, its effects on smaller firms are particularly adverse because such firms are generally resource constrained (Antcliff et al., 2021; Doern et al., 2019). Inflation is a crisis that puts entrepreneurs who are running small firms into a stressful situation. For instance, in a survey of the UK small business population conducted by the UK's Office for National Statistics (ONS) in July 2022, inflation was the top concern of UK businesses, ranking higher than competition, supply chain disruption, exchange rates, and other issues (ONS, 2022a, 2022b).

3.2. Study 1

3.2.1. Data

To test our hypotheses and the causal effect of crisis rumination on active coping and pivoting, we conducted a scenario experiment in July 2023 in which we manipulated entrepreneurs' crisis rumination.² A power analysis indicated that the minimum sample required was 102 participants ($\alpha = 0.05$, $\beta = 0.80$, $d = 0.50$). We recruited 237 entrepreneurs via Prolific, an established platform for online subject recruitment. Prolific has been used by researchers in fields such as economics (e.g., Marreiros et al., 2017), entrepreneurship (e.g., Zunino et al., 2021), and psychology (e.g., Callan et al., 2017).

The entrepreneurs participating in our study were owner-managers who own and run small and medium-sized businesses in the UK.

² A pilot experiment with 220 entrepreneurs was conducted in July 2022. The results obtained from this pilot experiment are consistent with the main experiment and are available upon request.

Since the UK is a multi-ethnic nation, our sample of entrepreneurs reflected this. We did not restrict the age, gender, education, or entrepreneurial experiences of the participants; therefore, our sample included a wide range of entrepreneurs from different backgrounds who have varied skills and run firms with dissimilar features. This wide variation in participants' backgrounds ensured that we captured the multi-ethnic, multi-background nature of entrepreneurs in the UK (Mickiewicz et al., 2019).

Following experimental research on rumination (Ray et al., 2008), we randomly assigned participants to either the crisis rumination condition, where they were asked to think and write about inflation and its impact on their business, or to the distraction condition, where they were asked to describe their own living room (more details about the manipulation are presented in the next section). After completing the writing task, participants rated their current rumination about inflation and their levels of anxiety as manipulation checks. Participants then rated their active coping and pivot engagement before answering demographic questions and questions related to the control variables.

3.2.2. Variables and estimations

3.2.2.1. Dependent variable: pivoting. The construct of pivoting has no agreed definition or measurement methodology in the extant literature (Chaparro and Gomes, 2021). However, given that it indicates substantial changes in the resource structure, transaction method, or value-offering elements of a company's business model (Snihur and Clarysse, 2022), we followed the well-established UK Longitudinal Small Business Survey (LSBS)³ and measured pivoting using a 4-item scale. Since all elements of a business model are highly integrated in the sense that a change in one element inevitably requires adjustment in the other elements (Cucculelli and Peruzzi, 2020; Ritter and Lettl, 2018), we conceptualized and measured pivoting as "overall business model pivoting." Specifically, we asked participants: "As a business owner, you now need to take some actions in your own business to deal with the inflation situation. How likely are you to: (i) change processes/ways of working or resource re-structuring, (ii) change methods of selling, (iii) change/modify services/products provided, and (iv) change your business model?" The scale ranged from 1 = strongly disagree to 7 = strongly agree. A principal factor analysis confirmed that the four items load on one scale (Eigenvalue factor 1 = 2.067, Eigenvalue factor 2, 3, and 4 are all negative). The scale has strong reliability (Cronbach alpha = 0.826, Raykov reliability = 0.827). High values indicate more pivoting, whereas low values indicate less pivoting and thus are consistent with a more passive wait-and-see approach. Table 1 presents the variable definitions and summary statistics.

3.2.2.2. Independent variable: crisis rumination. We manipulated participants' crisis rumination. To construct the variable crisis rumination, we assigned value 1 to the treatment group and value 0 to the control group. The instructions we gave to the participants were adapted from Ray et al. (2008) and were as follows:

Crisis Rumination (treatment): "We first want you to think about the current inflation situation in the UK. Britain has the highest rate of inflation among advanced economies. After inflation reached a 40-year high of 9.2% in December 2022, it currently stands at 7.9% in May 2023. Please carefully consider inflation from your perspective, turning it over and over in your mind. What does inflation mean for you and your business? We want you to focus on your thoughts and feelings about inflation. Also, try to think about why the inflation situation may have happened and its consequences for you and your business. In the space below please write at least 5 sentences about your thoughts and feelings about inflation and its causes and consequences for you and your business."

Distraction (control): "We first want you to think about your living room. Please describe your living room as you see it in your mind and how you would describe it to someone who has never been there. In the space below please write at least 5 sentences to describe your living room."

3.2.2.3. Mediating variable: active coping. We employed a 6-item scale to measure active coping (Duhachek, 2005). This scale is a refined version of the Coping Inventory for Stressful Situations (CISS) (Endler and Parker, 1990), which is a reliable and valid coping measure that has been extensively used in the literature (Vanstone and Hicks, 2019; Uy et al., 2013). Example items are "Concentrate on the ways the problem could be solved" and "Generate potential solutions" (1 = strongly disagree, 7 = strongly agree). High values indicate more active coping, whereas low values indicate less active coping, reflecting a more passive wait-and-see approach. The scale reliability was high (Cronbach alpha = 0.915, Raykov reliability = 0.922).

3.2.2.4. Moderating variable: Trait regulatory focus (promotion-prevention index). We used a well-established scale (Lockwood et al., 2002) to measure entrepreneurs' trait regulatory focus. Its promotion focus sub-scale has 9 items that have a high reliability (Cronbach alpha = 0.924, Raykov reliability = 0.927); a sample item is "Overall, I am more oriented toward achieving success than preventing failure". The prevention focus sub-scale also has 9 items (Cronbach alpha = 0.877, Raykov reliability = 0.887); a sample item is "I am more oriented toward preventing losses than I am toward achieving gains." We then constructed the variable promotion-prevention index by taking the difference between the two scores. This operationalization is in line with research that shows that promotion and prevention focus are two poles of an underlying trait and thus should be assessed relative to each other (Idson et al., 2000; Baas et al., 2011). The variable had a *positive* value when the promotion score was greater than the prevention score; it had a value of 0 when the two scores were equal and a *negative* value when the promotion score was smaller than the prevention score. Thus, higher values on the

³ More information about the survey is available at: <https://www.enterpriseresearch.ac.uk/our-work/data-sources/the-uk-longitudinal-small-business-survey/>

Table 1
Variable definition and summary statistics.

Variable	Definition	Mean	SD	Mean	SD
		Study 1		Study 2	
Dependent variables					
Pivot	A scale of 4 items (1 = strongly disagree, 7 = strongly agree): (i) change process/ways of working or resource restructuring, (ii) change methods of selling, (iii) change/modify services/products provided, and (iv) change your business model. The scale was adopted from the UK LSBS survey.	4.329	1.322	3.611	1.502
Independent variables					
Crisis rumination (study 1)	A dummy variable indicating the treatment (=1) and control (=0) groups. We randomly assigned participants to either the rumination versus distraction condition. The instruction was adapted from Ray et al., 2008.	0.519	0.501		
Crisis rumination (study 2)	The difference between crisis rumination in period 1 and crisis rumination in period 2, eight months later (period 2 minus period 1). The crisis rumination score in each period is measured using a scale of 7 items (1 = strongly disagree, 7 = strongly agree): (1) I am worried about inflation, (2) Thoughts about the inflation situation disturb my sleep, (3) I am afraid of the consequences of inflation on my family and business, (4) I notice that I think about the inflation situation several times a day, (5) I find it hard to empty my head of thoughts about the inflation situation during my work, (6) Even when I am engaged in recreational activities (e.g., hobbies, sports) I think of the inflation situation. The scale was adopted from Nikolova et al., 2021.			-0.117	1.045
Mediating variables					
Active coping (study 1)	A scale of 6 items which indicates the extent to which an entrepreneur would do the following in the current situation of inflation (1 = strongly disagree, 7 = strongly agree): (1) concentrate on ways the problem could be solved, (2) try to make a plan of action, (3) generate potential solutions, (4) think about the best way to handle things, (5) do what has to be done, and (6) follow a plan to make things better. The scale was adapted from Duhachek, 2005.	5.013	1.265		
Active coping (study 2)	The difference between active coping score in period 1 and active coping score in period 2, eight months later (period 2 minus period 1).			-0.484	1.208
Moderating variable					
Promotion-prevention index	A continuous variable: it takes the values of promotion scores minus prevention scores. The promotion and prevention scores are obtained from two 9-item scales of Lockwood et al., 2002. <i>Promotion focus:</i> (1) In general, I am focused on achieving positive outcomes in my life. (2) I frequently imagine how I will achieve my hopes and aspirations. (3) I often think about the person I would ideally like to be in the future. (4) I typically focus on the success I hope to achieve in the future. (5) I often think about how I will achieve career success. (6) My major goal right now is to achieve my career ambitions. (7) I see myself as someone who is primarily striving to reach my "ideal self" and fulfil my hopes, wishes, and aspirations. (8) I often imagine myself experiencing good things that I hope will happen to me (9) Overall, I am more oriented toward achieving success than preventing failure. <i>Prevention focus:</i> (1) In general, I am focused on preventing negative events in my life, (2) I am anxious that I will fall short of my responsibilities and obligations, (3) I often think about the person I am afraid I might become in the future, (4) I often worry that I will fail to accomplish my career goals, (5) I often imagine myself experiencing bad things that I fear might happen to me, (6) I am more oriented toward preventing losses than I am toward achieving gains, (7) My major goal right now is to avoid becoming a failure, (8) I see myself as someone who is primarily striving to become the self I "ought" to fulfil my duties, responsibilities, and obligations, (9) I frequently think about how I can prevent failures in my life.	1.025	1.526	0.931	1.926

(continued on next page)

Table 1 (continued)

Variable	Definition	Mean	SD	Mean	SD
		Study 1		Study 2	
Manipulation check (study 1 only)					
Rumination manipulation check	A scale of 4 items to measure the level of rumination of participants in the control and the treatment groups. Participants were asked to rate their thinking on four statements (1 = strongly disagree, 7 = strongly agree): (1) I know that what I have written will linger in my mind, (2) I will find myself replaying what I have just mentioned in the essay task, (3) I find it hard to empty my head of thoughts about what I have written, and (4) Negative thoughts about what I have written will linger in my mind. The scale was adopted from Strizhakova et al., 2012 .	2.945	1.549	NA	NA
Anxiety manipulation check	A scale of 4 items to measure the level of anxiety of participants in the control and the treatment groups. Participants were asked to rate "How do you feel now" (1 = strongly disagree, 7 = strongly agree): (1) Nervous (2) Anxious (3) Worried (4) Tense The scale was adopted from Brooks and Schweitzer, 2011 .	2.013	1.280	NA	NA
Control variables					
Firm age	Years since the business establishment	7.814	6.193	11.819	10.007
Firm size (employees)	Number of full-time employees	7.481	29.189	6.729	24.453
Owner age	Age of the business owners	40.464	11.560	46.792	12.578
Owner gender	A dummy variable: value 0 for females, value 1 for males	0.342	0.475	0.424	0.496
Owner education	A category variable: (1) less than high school (the benchmark), (2) high school, (3) two-year college degree or vocational school, (4) three to four-year college degree, (5) graduate degree or PhD	3.827	1.029	3.674	1.043
Owner experience	Years of entrepreneurial experience of the business owner	9.384	7.844	13.667	8.896
White (the benchmark)	A dummy variable: take value 1 if the business owner is white, 0 otherwise	0.886	0.318	0.931	0.255
Asian or Asian British	A dummy variable: take value 1 if the business owner is Asian or Asian British, 0 otherwise	0.034	0.181	0.021	0.143
Black or black British	A dummy variable: take value 1 if the business owner is black or black British, 0 otherwise	0.051	0.220	0.028	0.165
Mixed ethnics	A dummy variable: take value 1 if the business owner is mixed ethnics, 0 otherwise	0.030	0.170	0.021	0.143
Trait rumination	A scale of 4 items (1 = strongly disagree, 7 = strongly agree): (1) I tend to "ruminate" or dwell over things that happen to me for a really long time afterwards, (2) long after an argument or a disagreement is over, my thoughts keep going back to what happened, (3) I always seem to be rehashing in my mind recent things I have said or done; (4) I don't waste time rethinking things that are over and done with (reversed). The scale was adopted from Scott and McIntosh, 1999 .	4.466	1.542	4.372	1.782
Family support	A scale of 4 items (1 = strongly disagree, 7 = strongly agree): (1) there is someone from my family that I could talk to about my business, (2) when I am frustrated by my business, there is someone from my family that could try to understand, (3) there is someone from my family who would offer the following to me (e.g., offering business solutions, providing financial assistance, sharing household chores), (4) There is someone from my family that can give me useful feedback about my ideas concerning my business. The scale was adopted from Powell and Eddleston, 2013 .	4.601	1.791	4.484	2.009
Growth aspiration	The expected increase in the number of full-time employees in the next 3 years compared to the current number (in percentage).	1.584	3.388	1.156	0.933
Changes in revenues	A categorical variable: take value 1 if revenues decrease compared to last year, value 0 if revenues stay mostly stable compared to last year, and 1 if revenues increase compared to last year.	2.089	0.722	2.132	0.606
Prior pivots due to Covid	A dummy variable: take value 1 if the business made pivots due to Covid prior, 0 otherwise.	0.376	0.485	0.465	0.501
Prior pivots due to inflation (study 1 only)	A dummy variable: take value 1 if the business made pivots due to the current inflation, 0 otherwise.	0.225	0.418	NA	NA

Note: A set of 19 industry sectors are included in both studies: forestry, fishing, hunting or agriculture support, real estate, mining, professional or technical services, utilities, management of companies or enterprises, construction, manufacturing, educational services, wholesale trade, health care or social assistance, retail trade, arts entertainment or recreation, transportation or warehousing, accommodation or food services, information, finance or insurance, unclassified establishment, others. Study 1 has 237 entrepreneur participants. Study 2 has 144 entrepreneur participants.

index indicate stronger promotion focus and lower values indicate stronger prevention focus. In a robustness check, we obtained similar findings when we measured trait regulatory focus with a text-mining-based approach. Please see the robustness checks for details.

3.2.2.5. Control variables. As we were conducting the experiment, we assigned participants randomly to the control and treatment groups. Randomization means that there should be no systematic difference between the two groups in terms of common control variables such as demographic differences. To double-check whether the two groups were in fact truly randomized, we conducted a set of two-tail *t*-tests of the differences between the two groups. The statistics reported in Appendix 2 show no differences between the two groups for any of the control variables.

Following good practice for experiments in entrepreneurship research (Grégoire et al., 2019; Williams et al., 2019), we controlled for a set of confounding factors that might influence pivoting. At the individual level, these were *owner age*, *gender*, *education*, *entrepreneurial experience*, and *ethnicity*. These personal characteristics are related to entrepreneurs' human resources, mindsets, and access to external resources (Powell and Eddleston, 2013; Uy et al., 2013; Kolstad and Wiig, 2015), which might impact pivots. Moreover, individuals can also differ in terms of their tendency to engage in rumination. We thus controlled for *trait rumination*, which refers to individuals' stable ruminative tendencies, or the frequency of rumination they typically experience in daily life. We assessed this using an established 4-item scale (Scott and McIntosh, 1999). A sample item is "Long after an argument or a disagreement is over; my thoughts keep going back to what happened" (1 = strongly disagree, 7 = strongly agree). The scale demonstrated high reliability (Cronbach alpha = 0.904, Raykov reliability = 0.909).

At the firm level, we included *firm age*, *firm size* (number of full-time employees), and *industry sector* (19 sectors following the UK LSBS). These factors are likely to influence the capacity and thus the likelihood of a firm engaging in pivoting (Shepherd and Gruber, 2021). Moreover, since the inflation crisis had been ongoing for over a year at the point of our study and because it took place in the aftermath of the Covid-19 crisis, we also controlled for *prior pivots due to inflation* (1 = yes, 0 = no) and *prior pivots due to Covid* (1 = yes, 0 = no). We did this because entrepreneurs may have executed substantial pivots during the pandemic or just before undertaking our study, and they would therefore be less likely to pivot further because of resource constraints. Also, we controlled for *revenue changes compared to last year* (increase, stay stable, decrease) because a decrease in revenues can represent a resource threat which—according to our theorizing—can elicit pivoting (Chaparro and Gomes, 2021). Next, we included *family support*, which can be a source of resources that may facilitate pivots. We used a 4-item scale to measure the emotional and practical support received by the entrepreneurs from their families (Powell and Eddleston, 2013). A sample item is "There is someone from my family who would offer the following to me (e.g., offering business solutions, providing financial assistance, sharing household chores)." The scale is highly reliable in our context (Cronbach alpha = 0.935, Raykov reliability = 0.935). Finally, we included *growth aspiration* (expectations of an increase in the number of employees in the next three years) (Estrin et al., 2013) as a control variable because entrepreneurs with higher growth aspirations are more likely to seek out opportunities (Fuentelsaz et al., 2020) and thus may engage in pivoting. The pairwise correlations of all variables are reported in Appendix 3.

3.2.2.6. Estimation. We estimated the impact of rumination about inflation on pivoting using OLS. The standard errors in all specifications were adjusted to be robust to heteroskedasticity.

3.2.3. Results

3.2.3.1. Manipulation check. We tested whether the randomized crisis rumination manipulation was successful. We asked participants to rate (1 = strongly disagree, 7 = strongly agree) four statements after the writing task (i.e., the crisis rumination manipulation): (i) "I know that what I have written will linger in my mind," (ii) "I will find myself replaying what I have just mentioned in the essay task," (iii) "I find it hard to empty my head of thoughts about what I have written," and (iv) "Negative thoughts about what I have written will linger in my mind." The first three items were adapted from the study of Strizhakova et al. (2012) to capture the levels of rumination; we added the fourth item to specifically ask about *negative* thoughts that are specific to *crisis* rumination. The scale has a strong reliability (Cronbach alpha = 0.924, Raykov reliability = 0.923). The treatment (crisis rumination) group reported significantly more rumination than the control group: $M_{\text{rumination}} = 3.431$; $SD_{\text{rumination}} = 0.145$, $N_{\text{rumination}} = 123$, and $M_{\text{control}} = 2.421$; $SD_{\text{control}} = 0.121$, $N_{\text{control}} = 114$, $p_{\text{value, two tail t-test}} < 0.001$.⁴

3.2.3.2. Hypothesis tests. To test our hypotheses, we first ran a simple regression without control variables; the coefficient of crisis rumination on pivoting is 0.579 (SD = 0.168, p -value = 0.001). This initial finding supports our expectation that crisis rumination positively influences pivoting.

Next, we turned to multiple regression analysis, as reported in Table 2. The Variance Inflation Factor (VIF) statistics of all

⁴ To further check the nature of negative thoughts, we also included a brief anxiety measure just after the rumination manipulation as an additional manipulation check. We adopted the scale by Brooks and Schweitzer (2011) and asked participants "How do you feel now?" and they rated their level of feeling (i) Nervous, (ii) Anxious, (iii) Worried, and (iv) Tense. Recall that our theorizing builds on the notion that crisis rumination is a response to a threat and therefore entails anxious emotions that can energize actions like active coping and pivoting. The treatment (crisis rumination) group reported significantly higher levels of anxiety than the control group: $M_{\text{rumination}} = 2.520$; $SD_{\text{rumination}} = 1.483$, and $M_{\text{control}} = 1.465$; $SD_{\text{control}} = 0.682$, $p_{\text{value, two tail t-test}} < 0.001$.

specifications are <5, indicating no serious heterogeneity issues with our model specifications. The coefficients associated with the variable *crisis rumination* are positive and statistically significant in all specifications where pivoting is the dependent variable (columns 1, 2, 4, 5, and 6). This finding thus confirms the positive impact of crisis rumination on pivoting. In other words, entrepreneurs who ruminate about the inflation crisis are more likely to pivot. Therefore, hypothesis H1 is supported. In terms of the effect size and taking column 1 as the benchmark ($\beta_{Rumination} = 0.525$, $p\text{-value} = 0.008$), the treatment group exhibits higher levels of pivoting than the control group's 0.525 unit in the 7-level scale of pivoting. Crisis rumination explains an additional 3.5 % of the variance in pivoting beyond control variables (i.e., the difference in R^2 between column 2 and the control-variable-only model in column 1: 30.2 %–26.7 %).

Regarding the mediating effect of active coping (H2), we first followed Baron and Kenny (1986) to test whether there are significant relationships between the dependent variable, the mediator, and the independent variable. Then, we employed the approach proposed by Hayes and Rockwood (2020) to test the significance of the pathway of the indirect effect. This method uses a seemingly unrelated regression and bootstrapped approach and is able to yield bias-corrected standard errors and an accelerated confidence interval for the indirect effects.

First, we tested the following: (i) the significance of the independent variable on the dependent variable (column 2); (ii) the significance of the independent variable on the mediator (column 3); and (iii) the significance of the mediator on the dependent variable

Table 2
Study 1 (experiment) regression results.

	(1)	(2)	(3)	(4)	(5)	(6)	(7)
	Pivot	Pivot	Active coping	Pivot	Pivot	Pivot (H3a)	Active coping (H3b)
Crisis rumination		0.525*** (0.107)	0.440*** (0.032)		0.372** (0.109)	1.228*** (0.188)	2.784*** (0.419)
Active coping				0.375*** (0.019)	0.348*** (0.018)		
Promotion-prevention index × Crisis rumination						-0.174** (0.041)	-0.543*** (0.096)
Promotion-prevention index						0.436*** (0.046)	0.662*** (0.088)
Firm age	-0.014 (0.009)	-0.015 (0.008)	-0.011 (0.011)	-0.010 (0.008)	-0.011 (0.008)	-0.010 (0.007)	-0.007 (0.010)
Firm size (log employees)	0.290*** (0.018)	0.267*** (0.017)	0.171** (0.046)	0.219*** (0.010)	0.208*** (0.009)	0.227*** (0.019)	0.125* (0.050)
Owner age	-0.006 (0.005)	-0.005 (0.005)	0.012** (0.003)	-0.010 (0.005)	-0.009 (0.005)	0.003 (0.006)	0.020*** (0.002)
Owner gender	-0.319*** (0.055)	-0.342*** (0.051)	0.113 (0.068)	-0.369*** (0.050)	-0.382*** (0.044)	-0.298*** (0.042)	0.165** (0.041)
Owner education	0.113** (0.032)	0.097** (0.027)	-0.058* (0.021)	0.129** (0.029)	0.117*** (0.025)	0.121*** (0.024)	-0.048** (0.015)
Owner experiences (log)	0.112 (0.058)	0.154** (0.049)	0.116* (0.054)	0.082 (0.069)	0.114 (0.061)	0.080 (0.042)	0.030 (0.064)
Asian or Asian British	0.044 (0.068)	-0.174* (0.079)	0.848*** (0.154)	-0.342** (0.082)	-0.469** (0.115)	-0.312* (0.130)	0.786*** (0.107)
Black or black British	-0.098 (0.111)	-0.045 (0.127)	-0.028 (0.164)	-0.071 (0.061)	-0.035 (0.076)	-0.021 (0.116)	-0.026 (0.155)
Mixed ethnicity	0.049 (0.139)	0.121 (0.142)	-0.638*** (0.026)	0.311* (0.139)	0.343* (0.141)	0.264 (0.128)	-0.416*** (0.035)
Trait rumination	0.136* (0.054)	0.147** (0.052)	0.002 (0.018)	0.139* (0.051)	0.146** (0.050)	0.084* (0.036)	-0.066*** (0.008)
Family support	0.111*** (0.011)	0.104*** (0.010)	0.049 (0.061)	0.091*** (0.014)	0.087*** (0.014)	0.081*** (0.004)	0.028 (0.045)
Growth aspiration	0.055*** (0.005)	0.054*** (0.004)	0.040** (0.012)	0.040** (0.009)	0.040*** (0.007)	0.043*** (0.007)	0.035** (0.009)
Revenue changes	0.166** (0.053)	0.136** (0.047)	-0.159* (0.066)	0.216** (0.069)	0.191** (0.066)	0.101* (0.045)	-0.179* (0.080)
Prior pivots due to Covid	0.183 (0.117)	0.184 (0.102)	-0.071 (0.040)	0.210 (0.099)	0.209* (0.090)	0.198* (0.078)	-0.049 (0.042)
Prior pivots due to inflation	0.419** (0.101)	0.482*** (0.082)	0.405 (0.281)	0.287 (0.175)	0.342 (0.161)	0.438** (0.112)	0.314 (0.218)
Constant	2.741** (0.741)	2.464*** (0.525)	4.360*** (0.807)	1.021* (0.453)	0.948* (0.373)	0.816 (0.784)	1.817 (1.351)
Observations	237	237	237	237	237	237	237
R-squared	0.267	0.302	0.179	0.375	0.392	0.344	0.271

Note: The dependent variable is pivot in columns 1, 3, 4, 5 and 6. The dependent variable is active coping in columns 2 and 7. The estimator is robust OLS. The promotion-prevention focus index is promotion value minus prevention value. A full set of 19 industry sectors are included in all specifications. The figures reported in parentheses are heteroskedasticity robust standard errors. * indicates significance at 10 %, ** significance at 5 %, and *** significance at 1 %.

(column 4). The results from these tests reveal that crisis rumination is positively associated with active coping and pivoting, and also that active coping is positively associated with pivoting. Moreover, the effect of crisis rumination on pivoting reduces when the mediator (active coping) is added into the model ($\beta_{\text{Rumination}} = 0.525$ in column 2 and $\beta_{\text{Rumination}} = 0.372$ in column 5). As suggested by Baron and Kenny (1986), these findings indicate the existence of a mediation effect. Next, we conducted a path analysis using the method of Hayes and Rockwood (2020) to formally test the significance of the mediating effect. The results, presented in Table 3, show that 29.2 % of the effect of crisis rumination on pivoting is mediated by active coping, and the ratio of indirect effect to direct effect is 0.412. Moreover, the Sobel-Goodman mediation tests ($\beta = 0.153$; $p\text{-value} < 0.001$), the percentile confidence interval = [0.040, 0.303], the bias-corrected confidence interval = [0.044, 0.322], and the bias-corrected and accelerated confidence interval = [0.039, 0.322] support the existence and significance of the indirect effect. Therefore, we conclude that active coping mediates the effect of crisis rumination on pivoting, supporting H2.

Next, we turned to the moderating effect of trait regulatory focus (H3a, H3b). We tested the moderating effect of trait regulatory focus (the promotion-prevention index) on the relationship between crisis rumination and pivoting (H3a). Table 2, column 6 shows the regression results. The coefficient associated with the interaction term between rumination and the promotion-prevention index is negative and statistically significant ($\beta_{\text{Rumination} \times \text{Promotion-prevention index}} = -0.174$, $p\text{-value} = 0.013$). This finding indicates that the positive impact of rumination on pivoting is stronger for entrepreneurs with greater prevention focus than for entrepreneurs with greater promotion focus. As can be seen in Fig. 2, on average an increase in rumination about inflation boosts entrepreneurs' pivoting; this positive relationship is stronger when entrepreneurs are more prevention focused than when they are more promotion focused (the slope of the solid line is steeper than that of the dashed line). Therefore, hypothesis H3a is supported.

We then the moderating effect of trait regulatory focus (the promotion-prevention index) on the relationship between crisis rumination and active coping (H3b). The results are presented in Table 2, column 7. Again, the coefficient associated with the interaction term between rumination and the promotion-prevention index is negative and statistically significant ($\beta_{\text{Rumination} \times \text{Promotion-prevention index}} = -0.543$, $p\text{-value} = 0.005$). This finding indicates that the positive impact of crisis rumination on active coping is stronger for more prevention-focused entrepreneurs than for more promotion-focused entrepreneurs. Fig. 3 shows that an increase in crisis rumination about inflation boosts active coping, and that this positive relationship is stronger when entrepreneurs are more prevention focused than when they are more promotion focused (the slope of the solid line is steeper than that of the dashed line). As such, hypothesis H3b is supported.

Finally, we tested the moderated mediating effect of trait regulatory focus on the relationship between crisis rumination and pivoting via active coping (H4). We employed Hayes' model 8, bootstrapping the samples 5000 times to obtain reliable confidence intervals. We employed the Davidson and MacKinnon (1993) approach to obtain heteroskedasticity-consistent standard errors. Table 4 presents the results. The index of moderated mediation is -0.154 ($SE = 0.071$, $LLCI = -0.312$, $ULCI = -0.031$), consistent with the negative moderating effect on the relationship between rumination and pivoting. Table 4 reports that when the promotion-prevention index is higher (indicating more promotion focus than prevention focus), the effect size of crisis rumination on pivoting via active coping is smaller ($\beta_{\text{Rumination}} = 0.104$, $SE = 0.054$, $LLCI = 0.012$, $ULCI = 0.228$); however, when the promotion-prevention index is smaller (indicating more prevention focus than promotion focus), the effect size of crisis rumination on pivoting via active coping is higher ($\beta_{\text{Rumination}} = 0.244$, $SE = 0.095$, $LLCI = 0.079$, $ULCI = 0.447$). These findings thus lend support to hypothesis H4.

Table 3
Path analysis of the indirect effect (study 1).

	Coefficients	Z-statistics
Panel A: Indirect, direct, and total effects		
Total effect	0.525***	4.924
Direct effect	0.372***	3.404
Indirect effect	0.153***	11.323
The proportion of total effect that is mediated	29.2 %	
Ratio of indirect effect to direct effect	0.412	
Panel B: Sobel-Goodman mediation tests		
Sobel	0.153***	11.323
Aroian	0.153***	11.313
Goodman	0.153***	11.333
Panel C: Test of the indirect effects		
Observed coefficient (bootstrap SD)	Bias	95 % confidence interval
0.156**(0.069)	0.002	[0.040, 0.303] (P) [0.044, 0.322] (BC) [0.039, 0.322] (BCa)

Note: (P) indicates percentile CI, (BC) indicates biased corrected CI, (BCa) indicates biased corrected and accelerated CI. * indicates significance at 10 %, ** significance at 5 %, and *** significance at 1 %.

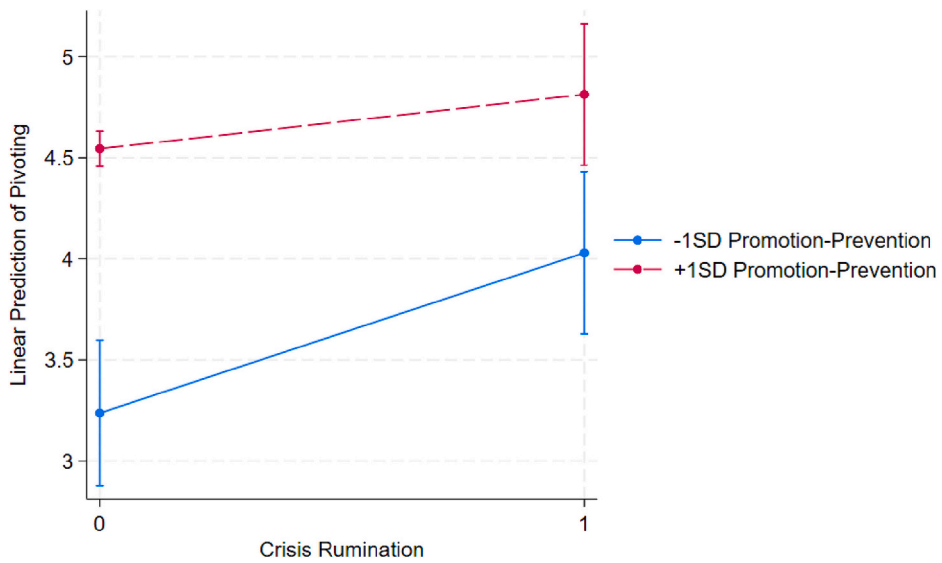


Fig. 2. Moderating effect of regulatory focus on pivoting (study 1).

Note: Solid line indicates higher trait *prevention* focus-1SD Promotion-Prevention index is one standard deviation below the mean of Promotion-Prevention Index variable, indicating that trait prevention focus is greater than trait promotion focus. Dashed line indicates higher trait *promotion* focus, specifically, +1SD Promotion-Prevention index is one standard deviation above the mean of Promotion-Prevention Index variable, indicating that trait promotion focus is greater than trait prevention focus.

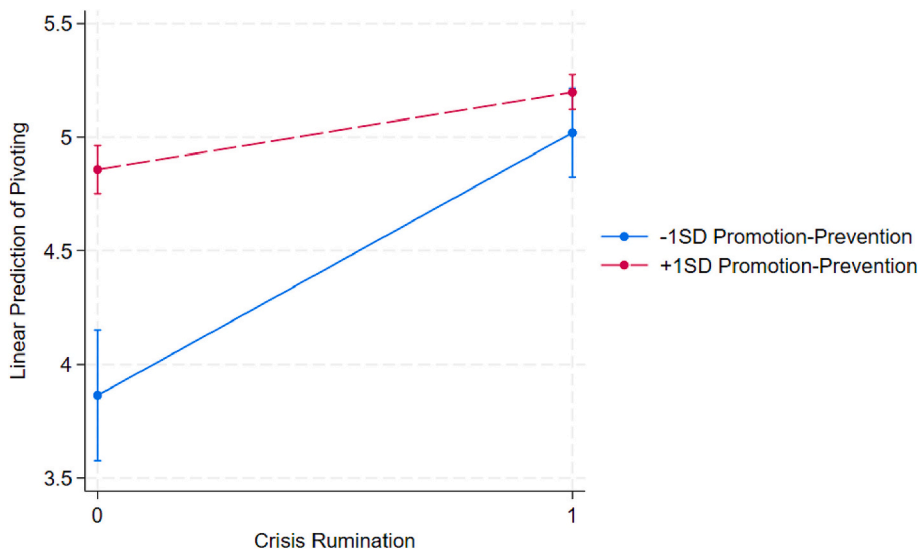


Fig. 3. Moderating effect of regulatory focus on active coping (study 1).

Note: Solid line indicates higher trait *prevention* focus-1SD Promotion-Prevention index is one standard deviation below the mean of Promotion-Prevention Index variable, indicating that trait prevention focus is greater than trait promotion focus. Dashed line indicates higher trait *promotion* focus, specifically, +1SD Promotion-Prevention index is one standard deviation above the mean of Promotion-Prevention Index variable, indicating that trait promotion focus is greater than trait prevention focus.

Table 4
Moderated mediating effect of regulatory focus (study 1).

Moderated mediating relationships	Effect	Bootstrapped SE	Bootstrapped lower-level CI	Bootstrapped upper-level CI
Index of moderated mediation	-0.154	0.069	-0.303	-0.036
One -1SD below the mean of the promotion-prevention index (indicating more prevention focus than promotion focus)	0.244	0.095	0.079	0.447
One +1SD above the mean of the promotion-prevention index (indicating more promotion focus than prevention focus)	0.104	0.054	0.012	0.228

Note: SD indicates standard deviation, SE indicates standard errors, CI indicates confident intervals. The results are calculated using Hayes' model 8.

3.3. Study 2

Study 2 is a longitudinal field study of UK entrepreneurs that was conducted during the UK inflation crisis.

3.3.1. Data

In December 2022, we surveyed 319 entrepreneurs recruited through Prolific.⁵ In the survey, entrepreneurs rated their ruminative thoughts about the inflation crisis (crisis rumination), active coping, pivoting, and questions related to the same set of control variables as in Study 1. In July 2023, eight months after the first survey, we contacted the entrepreneurs again and asked them to participate in a follow-up survey. Nearly half of the 319 entrepreneurs (144 = 45 %) took part in this second-wave survey, which asked entrepreneurs to rate their crisis rumination, active coping, and pivoting actions during the last eight months, as well as their regulatory focus.

3.3.2. Variables and estimation

3.3.2.1. Dependent variable: Pivoting. We measured the actual pivots that the entrepreneurs had conducted between the two surveys. We asked entrepreneurs, "In the last 8 months, to what extent did you take the following actions to help your business deal with the inflation situation?". The four items of pivoting used in this study (0 = strongly disagree, 7 = strongly agree) are identical to those of Study 1. A principal factor analysis confirmed that the four items load on one scale (Eigenvalue factor 1 = 2.411, Eigenvalue factor 2, 3, and 4 are all negative), and the scale has strong reliability (Cronbach alpha = 0.871, Raykov reliability = 0.871). As before, high values indicate more pivoting whereas low values indicate less pivoting, consistent with a more passive wait-and-see approach. [Table 1](#) presents the variable definitions and summary statistics.

3.3.2.2. Independent variable of interest: Crisis rumination. We employed and adapted the Covid-19 crisis rumination scale developed and validated by [Nikolova et al. \(2021\)](#) to measure entrepreneurs' rumination about the inflation crisis. Consistent with the theorizing of the construct, the scale has six items, three of which measure the levels of repetitive thoughts about inflation. A sample question is "Even when I am engaged in recreational activities (e.g., hobbies, sports) I think of the inflation situation". The other three items measure levels of associated negative feelings (i.e., anxiety) (e.g., "I am afraid of the consequences of inflation on my family and business"). Our measure of crisis rumination is the difference between participants' crisis rumination measured in December 2022 and their crisis rumination measured in July 2023. This method of calculation allows us to observe within-subject changes in crisis rumination over time. Specifically, $M_{\text{rumination period}_1} = 3.642$, $SD_{\text{rumination period}_1} = 1.249$, Cronbach alpha_{rumination period_1} = 0.886, Raykov reliability_{rumination period_1} = 0.897; and $M_{\text{rumination period}_2} = 3.525$, $SD_{\text{rumination period}_2} = 1.338$, Cronbach alpha_{rumination period_2} = 0.903, Raykov reliability_{rumination period_2} = 0.911. The mean value of the variable is -0.117 (SD = 1.045), which indicates that on average, entrepreneurs ruminated less about inflation as the crisis evolved.

3.3.2.3. Mediating variable: Active coping. Consistent with Study 1, we employed a 6-item scale to measure active coping strategies ([Duhachek, 2005](#)) in both December 2022 and July 2023. Specifically, $M_{\text{active coping period}_1} = 5.052$, $SD_{\text{active coping period}_1} = 1.042$, Cronbach alpha_{active coping period_1} = 0.925, Raykov reliability_{active coping period_1} = 0.930; meanwhile, $M_{\text{active coping period}_2} = 4.567$, $SD_{\text{active coping period}_2} = 1.428$, Cronbach alpha_{active coping period_2} = 0.942, Raykov reliability_{active coping period_2} = 0.950. The mean value of the active coping variable is -0.485 (SD = 1.208), indicating that entrepreneurs adopted less active coping as time went on and the inflation crisis persisted.

3.3.2.4. Moderating variable: Trait regulatory focus (promotion-prevention index). We measured entrepreneurs' trait regulatory focus in the second-wave survey because trait regulatory focus is relatively stable over time.⁶ We employed the scale from [Lockwood et al. \(2002\)](#) which captures individuals' chronic trait regulatory focus. Consistent with Study 1, we employed two 9-item scales to assess promotion and prevention regulatory focus (Cronbach alpha_{promotion} = 0.861, Raykov reliability_{promotion} = 0.863; Cronbach

⁵ A pilot survey of 293 entrepreneurs was conducted in July 2022. The results obtained from the pilot are consistent with the main study and are available upon request.

⁶ In a robustness check (Appendix 7), we measured trait regulatory focus in period 1 using a text-mining method.

$\alpha_{\text{prevention}} = 0.915$, Raykov reliability_{prevention} = 0.923). We then took the difference between the promotion and prevention focus scores to create the promotion-prevention index. In a robustness check, we assessed trait regulatory focus using a text-mining based measure *during the first survey* in December 2022 and obtained similar findings. Please see the robustness check section for details. Prior management research used the text-mining approach to measure trait regulatory focus over time (Gamache et al., 2015; Mount and Baer, 2022). This suggests that it is unlikely that our results would change if regulatory focus were assessed earlier or later in our study.

3.3.2.5. *Control variables.* To ensure consistency, we employed the same set of control variables as in Study 1, except for controlling for prior pivots due to inflation. We excluded this control variable because our dependent variable measured pivots conducted by entrepreneurs between December 2022 and July 2023 as well as those conducted prior to December 2022. All variables were assessed with established scales (see the description of Study 1) and have high reliability (Cronbach alpha and Raykov reliability were always 0.85 or higher). The pairwise correlations of all variables are reported in Appendix 3.

3.3.2.6. *Estimation.* As with Study 1, we estimated the impact of crisis rumination on pivoting using OLS regressions. The standard errors in all specifications were adjusted to be robust to heteroskedasticity.

3.3.3. *Results*

The regression results are reported in Table 5. The VIF test statistics are smaller than 5, indicating that multicollinearity should not

Table 5
Study 2 (longitudinal survey) regression results.

	(1)	(2)	(3)	(4)	(5)	(6)	(7)
	Pivot	Pivot	Active coping	Pivot	Pivot	Pivot (H3a)	Active coping (H3b)
Crisis rumination		0.272*** (0.016)	0.453*** (0.030)		0.130*** (0.010)	0.351*** (0.013)	0.481*** (0.010)
Active coping				0.361*** (0.023)	0.314*** (0.019)		
Promotion-prevention index × Crisis rumination						-0.014** (0.003)	-0.035*** (0.005)
Promotion-prevention index						0.055** (0.015)	-0.065 (0.030)
Firm age	-0.008 (0.006)	-0.008 (0.006)	-0.000 (0.002)	-0.008 (0.007)	-0.008 (0.007)	0.002 (0.001)	-0.001 (0.002)
Firm size (log employees)	0.164*** (0.014)	0.159*** (0.011)	0.046*** (0.006)	0.144*** (0.014)	0.145*** (0.013)	0.143*** (0.018)	0.050* (0.017)
Owner age	-0.026* (0.008)	-0.024** (0.006)	0.009 (0.006)	-0.028** (0.009)	-0.027** (0.008)	-0.029** (0.007)	0.009** (0.002)
Owner gender	-0.353*** (0.050)	-0.435*** (0.067)	-0.106 (0.095)	-0.364*** (0.035)	-0.401*** (0.067)	-0.564*** (0.082)	-0.029 (0.073)
Owner education	-0.058 (0.053)	-0.074 (0.075)	-0.080 (0.063)	-0.039 (0.055)	-0.049 (0.064)	0.005 (0.016)	-0.042* (0.017)
Owner experiences (log)	0.019 (0.013)	0.022 (0.011)	-0.014 (0.008)	0.026 (0.014)	0.027 (0.013)	0.009 (0.008)	-0.014* (0.005)
Asian or Asian British	0.913*** (0.144)	0.869*** (0.121)	0.634*** (0.094)	0.658** (0.147)	0.670** (0.131)	0.997*** (0.021)	0.639*** (0.040)
Black or black British	1.696*** (0.192)	1.670*** (0.148)	0.136 (0.258)	1.631*** (0.078)	1.627*** (0.071)	1.784*** (0.056)	0.201* (0.064)
Mixed ethnicity	-1.356*** (0.100)	-1.227*** (0.125)	0.314*** (0.037)	-1.392*** (0.114)	-1.326*** (0.124)	-1.004*** (0.099)	0.177 (0.094)
Trait rumination	-0.041 (0.031)	-0.059 (0.049)	0.037 (0.023)	-0.065 (0.044)	-0.071 (0.051)	-0.012 (0.030)	0.031*** (0.004)
Family support	0.059 (0.032)	0.065 (0.031)	0.072 (0.049)	0.037 (0.018)	0.043 (0.019)	0.047** (0.014)	0.082*** (0.004)
Growth aspiration	0.050 (0.156)	0.084 (0.140)	0.123 (0.081)	0.026 (0.131)	0.046 (0.127)	0.072 (0.041)	0.109*** (0.009)
Revenue changes	0.260 (0.240)	0.286 (0.245)	0.127 (0.219)	0.230 (0.164)	0.246 (0.177)	0.243*** (0.039)	0.069 (0.042)
Prior pivots due to Covid	0.872*** (0.124)	0.897*** (0.132)	0.534*** (0.040)	0.694** (0.127)	0.729** (0.129)	0.951*** (0.178)	0.521*** (0.062)
Constant	3.465** (0.725)	3.418** (1.000)	-1.619 (0.969)	4.020*** (0.603)	3.927** (0.754)	5.147*** (0.320)	-1.618*** (0.061)
Observations	144	144	144	144	144	144	144
R-squared	0.293	0.327	0.248	0.368	0.375	0.444	0.256

Note: The dependent variable is pivot in columns 1, 3, 4, 5 and 6. The dependent variable is active coping in columns 2 and 7. The estimator is robust OLS. The promotion-prevention focus index is promotion value minus prevention value. A full set of 19 industry sectors are included in all specifications. The figures reported in parentheses are heteroskedasticity robust standard errors. * indicates significance at 10 %, ** significance at 5 %, and *** significance at 1 %.

be an issue in any of the specifications. Column 1 presents the model with control variables only. Columns 2–5 examine the direct effect of crisis rumination on pivoting (H1) and the mediating effect of active coping (H2). Columns 6 and 7 test the moderating effects of regulatory focus on pivoting (H3a) and active coping (H3b).

The results replicate the findings of our experimental study; specifically, the coefficients of crisis rumination are positive and statistically significant in all specifications where pivoting is the dependent variable (columns 2, 4, 5, and 6), again supporting H1. In terms of the effect size, we take column 1 as the benchmark, and when crisis rumination increases by one point on a 7-point Likert scale during the study period (from December 2022 to July 2023), the level of pivots increases by 0.272 points on a 7-point Likert scale, holding all else constant. Similar to Study 1, crisis rumination explains an additional 3.4 % of the variation in pivoting beyond the control variables (i.e., R2 of column 2 minus column 1: 32.7 %–29.3 %).

Regarding the mediating effect of active coping, columns 2 and 3 of Table 5 indicate that crisis rumination is positively associated with active coping and that active coping, in turn, is positively associated with pivoting. When we included both variables in one model (column 4), the coefficient of crisis rumination reduces in size ($\beta_{\text{Rumination}} = 0.272$ in column 1 and $\beta_{\text{Rumination}} = 0.130$ in column 4). This finding indicates the existence of a mediating effect of active coping. The path analysis in Table 6 shows that 52.3 % of the effect of rumination about inflation on pivot is mediated by active coping, and the ratio of indirect effect to direct effect is 1.097. Moreover, the Sobel-Goodman mediation tests ($\beta = 0.142$, $p\text{-value} < 0.001$), the percentile confidence interval = [0.086, 0.299], the bias-corrected confidence interval = [0.094, 0.319], and the bias-corrected and accelerated confidence interval = [0.095, 0.320] support H2 in that there is a significant indirect effect of crisis rumination on pivots via active coping.

Turning to the moderating effect of trait regulatory focus (H3a, H3b), the results in column 6 show that the coefficient of the interaction term between rumination and the promotion-prevention index is negative and statistically significant ($\beta_{\text{Rumination} \times \text{Promotion-prevention index}} = -0.174$, $p\text{-value} = 0.012$), supporting H3a. To illustrate the moderating effect, we present the marginal effects in Fig. 4, which was compiled using the results from Table 3, column 6. On average, an increase in crisis rumination boosts entrepreneurs' engagement in pivoting. As Fig. 3 illustrates, this positive relationship is stronger when entrepreneurs are more prevention focused than when they are more promotion focused (the slope of the solid line is steeper than the dashed line).

Next, we tested the moderating effect of trait regulatory focus (the promotion-prevention index) on the relationship between crisis rumination and active coping (H3b). Column 7, Table 5 shows that the coefficient associated with the interaction term between rumination and the promotion-prevention index is negative and statistically significant ($\beta_{\text{Rumination} \times \text{Promotion-prevention index}} = -0.035$, $p\text{-value} = 0.006$). We illustrate this moderating effect in Fig. 5, which shows that an increase in crisis rumination generally boosts active coping, and that this positive relationship is stronger when entrepreneurs are more prevention focused than when they are more promotion focused. As such, hypothesis H3b is supported.

Finally, to test the moderated mediating effect of the promotion-prevention focus index on the relationship between crisis rumination and pivoting via active coping (H4), we employed Hayes' model 8, as in Study 1. Table 7 presents the results. The index of moderated mediation is -0.025 (SE = 0.024, LLCI = -0.076 , ULCI = -0.002). When the promotion-prevention index is higher (indicating stronger promotion focus), the size of the effect of crisis rumination on pivoting via active coping is smaller ($\beta_{\text{Rumination}} = 0.192$, SE = 0.061, LLCI = 0.096, ULCI = 0.295); in comparison, when the promotion-prevention index is smaller (indicating stronger prevention focus), the size of the effect of crisis rumination on pivoting via active coping is higher ($\beta_{\text{Rumination}} = 0.239$, SE = 0.086, LLCI = 0.119, ULCI = 0.401). These findings support H4.

Table 6
Path analysis of the indirect effect (study 2).

	Coefficients	Z-statistics
Panel A: Indirect, direct, and total effects		
Total effect	0.272***	17.215
Direct effect	0.130***	13.389
Indirect effect	0.142***	11.221
Proportion of total effect that is mediated	52.3 %	
Ratio of indirect effect to direct effect	1.097	
Panel B: Sobel-Goodman mediation tests		
Sobel	0.142***	11.221
Aroian	0.142***	11.210
Goodman	0.142***	11.232
Panel C: Test of the indirect effects		
Observed coefficient (bootstrap SD)	Bias	95 % confidence interval
0.186*** (0.054)	-0.002	[0.086, 0.299] (P) [0.094, 0.319] (BC) [0.095, 0.320] (BCa)

Note: (P) indicates percentile CI, (BC) indicates biased corrected CI, (BCa) indicates biased corrected and accelerated CI. * indicates significance at 10 %, ** significance at 5 %, and *** significance at 1 %.

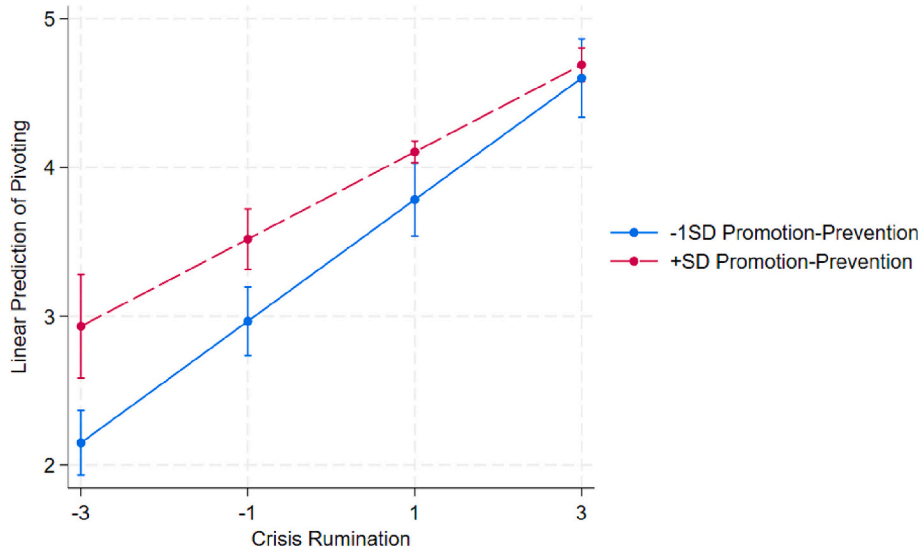


Fig. 4. Moderating effect of regulatory focus on pivoting (study 2).

Note: Solid line indicates higher trait *prevention* focus-1SD Promotion-Prevention index is one standard deviation below the mean of Promotion-Prevention Index variable, indicating that trait prevention focus is greater than trait promotion focus. Dashed line indicates higher trait *promotion* focus, specifically, +1SD Promotion-Prevention index is one standard deviation above the mean of Promotion-Prevention Index variable, indicating that trait promotion focus is greater than trait prevention focus.

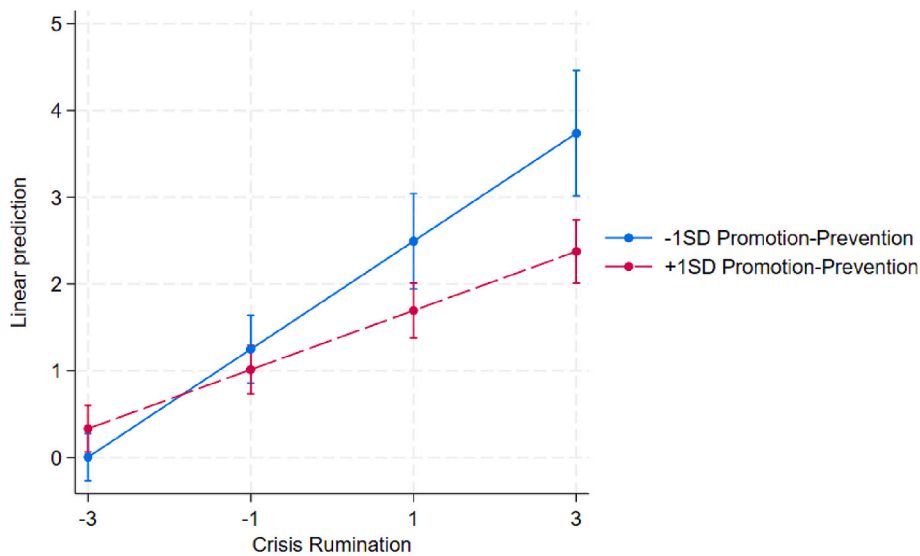


Fig. 5. Moderating effect of regulatory focus on active coping (study 2).

Note: Solid line indicates higher trait *prevention* focus-1SD Promotion-Prevention index is one standard deviation below the mean of Promotion-Prevention Index variable, indicating that trait prevention focus is greater than trait promotion focus. Dashed line indicates higher trait *promotion* focus, specifically, +1SD Promotion-Prevention index is one standard deviation above the mean of Promotion-Prevention Index variable, indicating that trait promotion focus is greater than trait prevention focus.

3.4. Robustness checks

We conducted five robustness checks to ensure that our findings were not driven by specific measurement and model specifications. First, for the longitudinal study (Study 2), we employed crisis rumination and active coping from period 1 as control variables in a regression that used crisis rumination and active coping from period 2 to explain the variations of pivots in period 2. This setting was designed to check whether our results were driven by the difference model. Second, we employed the Gaussian Copula approach (Eckert and Hohberger, 2022) to control for potential endogeneity related to missing variables in Study 2. Third, we applied a multi-

Table 7
Moderated mediating effect of regulatory focus (study 2).

Moderated mediating relationships	Effect	Bootstrapped SE	Bootstrapped lower-level CI	Bootstrapped upper-level CI
Index of moderated mediation	-0.025	0.024	-0.076	-0.002
One -SD below the mean of the promotion-prevention index (indicating more prevention focus than promotion focus)	0.239	0.086	0.119	0.401
One +SD above the mean of the promotion-prevention index (indicating more promotion focus than prevention focus)	0.192	0.061	0.096	0.295

Note: SD indicates standard deviation, SE indicates standard errors, CI indicates confident intervals. The results are calculated using Hayes' model 8.

modeling approach to test whether our findings were driven by knife-edge model specifications or if they are robust to different sets of control variables. Fourth, we used an alternative measure of entrepreneurs' trait regulatory focus: a text-mining approach (Gamache et al., 2015; Kashmiri et al., 2019). Fifth, we examined the role played by anxiety in mediating the relationship between crisis rumination and pivoting. The detailed empirical settings and the results of these additional tests are presented in Appendix 4–8. The findings obtained from these tests are highly consistent with the results presented in the main text.

4. Discussion

Why do some entrepreneurs take action and pivot their business model in a crisis, while others are more passive, opting to take a wait-and-see approach? By integrating COR theory with research on crisis rumination, we developed a micro-level model that explains why entrepreneurs adopt a more active approach to a crisis (i.e., they employ active coping individually and pivot their business) as they become more strained by it (indicated by crisis rumination). Crisis rumination motivates and energizes entrepreneurs to act, helping them to mitigate further resource losses. This strain-based process is intensified for entrepreneurs who are inherently more sensitive to threats and losses, such as those whose trait regulatory focus is oriented to prevention. We found support for our predictions in an experiment and an eight-month longitudinal study, both of which were conducted with samples of UK entrepreneurs during the inflation (cost-of-living) crisis that started in 2022.

4.1. Enhancing research on crisis and entrepreneurship through a stress-based micro-level model

We drew on stress theories—COR theory (Hobfoll et al., 2018) and crisis rumination (Nikolova et al., 2021)—to generate a micro-level model that contributes a new theoretical explanation to research on crisis and entrepreneurship (Batjargal et al., 2023; Battisti et al., 2022; Newman et al., 2022). It explains why and how certain entrepreneurs respond to crises with a more active (vs a more passive) approach. While research on crisis and entrepreneurship has been accelerated by the global Covid-19 crisis, such research has mostly documented the ways in which entrepreneurs and businesses have reacted to crises and has studied how crises negatively affect entrepreneurs' well-being (e.g., for an overview, Batjargal et al., 2023; Belitski et al., 2022; Newman et al., 2022). Theoretical explanations and empirical tests of *why* we see entrepreneurs reacting to crises in diverse ways are still rare (Stephan et al., 2023), and accounts that connect individuals' experience of strain with their business-related actions are rarer still (for an exception, see Williams and Shepherd, 2016). Thus, we offer a new stress-based explanation and rigorous empirical tests that enhance understanding of how entrepreneurs navigate crises through action.

Our model not only advances research on entrepreneurship and crisis but also has broader implications for COR theory (Hobfoll et al., 2018). Recall that COR's desperation principle (i.e., how people act under conditions of significant and sustained adversity) has, until recently, been associated with a passive and defensive reaction that seeks to conserve resources (e.g., Chen et al., 2015; Holmgreen et al., 2017). Similarly, research on entrepreneurs' stress (Rauch et al., 2018) and the threat-rigidity theory (Staw et al., 1981) characterizes the responses of individuals to sustained strain and crisis as more passive and involving only narrow actions. Indeed, in a recent overview of COR, Hobfoll et al. (2018) discuss as seemingly counterintuitive the possibility that individuals under sustained strain may be forced to engage in exploration to find ways in which they can adapt to a stressful situation and prevent further resource losses. However, COR offers no guidance for when, how, and why individuals may react passively or adopt a more active explorative approach. Our model offers one such explanation by integrating crisis rumination (Nikolova et al., 2021) as a key mechanism and prevention regulatory focus (Higgins, 1998) as a moderator into COR theorizing.

4.2. Advancing emerging research on entrepreneurs' rumination

Our study advances emerging research on entrepreneurs' rumination in two ways. It considers rumination in response to crisis as a distinct stressor and it newly links rumination to entrepreneurial action (active coping, pivoting).

First, by focusing on crisis and crisis rumination, our study complements emerging entrepreneurship research on rumination which considers everyday stressors (Wach et al., 2021; Yang et al., 2021) but not macro-level systemic stressors like crises (for an exception, see Battisti et al., 2022). The focus on everyday stressors aligns with the broader research on stress recovery at work (Cropley and Zijlstra, 2011; Sonnentag et al., 2021) that informs entrepreneurship research on rumination, as well as research on stress and entrepreneurship more generally (Cardon and Patel, 2015; Rauch et al., 2018). However, crises present unique stressors characterized

by greater magnitude, duration, uncertainty, and uncontrollability, which lead to distinct experiences and prolonged strain as indicated by crisis rumination (Nikolova et al., 2021). These distinct experiences are likely to require specific response strategies that are still not well understood (Ahmed et al., 2022; Williams and Shepherd, 2016; Shepherd, 2020; Stephan et al., 2023). Our study underscores the importance of considering specifically crisis rumination to understand the psychological (cognitive, emotional) impact of crisis in future research. Crisis rumination is an important concept for comprehending systematic macro-level crises and also personal crises, such as illness or the loss of a loved one; these crises have similar features to macro-level crises (uncontrollability and overwhelmingness) but have received even less attention in entrepreneurship research (Doern et al., 2019).

Second, by theorizing (anchored in COR) and testing how crisis rumination shapes entrepreneurial action, our study expands the emerging entrepreneurship research on rumination (Battisti et al., 2022; Soenen et al., 2019; Wach et al., 2021; Weinberger et al., 2018; Yang et al., 2021) by linking it to new important outcomes (active coping, pivoting). Specifically, our study offers a novel and complementary perspective to existing research by charting how crisis rumination—an aversive experience—can elicit personal active coping and enhance business pivoting. In contrast, existing research on entrepreneurs' rumination has, with one exception (Weinberger et al., 2018), focused on documenting the (negative) effects of rumination on entrepreneurs' well-being (Battisti et al., 2022; Soenen et al., 2019; Wach et al., 2021; Yang et al., 2021). By linking rumination and entrepreneurial action, our study also responds to more general calls in recovery research to go beyond well-being and consider and clarify relationships with performance outcomes (Sonentag et al., 2021; Wendsche and Lohmann-Haislah, 2017).

Moreover, we contribute to research on entrepreneurs' rumination by shedding light on the “functionality” of affective forms of rumination and lack of detachment, both of which combine in crisis rumination, for entrepreneurial action. Our review of the emerging entrepreneurship research on rumination indicated that different types of rumination have different effects on well-being. However, only (Weinberger et al., 2018) give attention to the performance-related outcomes of rumination, showing that problem-solving pondering supports the daily creativity of entrepreneurs but that affective rumination does not. We therefore urge future research on rumination in entrepreneurship to carefully consider the different forms of rumination—*affective rumination* and *lack of detachment*, *problem-solving pondering*, as well as *trait rumination* (our control variable)—to understand how they might influence performance-related outcomes.

4.3. Extending our understanding of pivoting

This study contributes to research on entrepreneurs' pivoting (Chaparro and Gomes, 2021) by newly identifying rumination and active coping as psychological antecedents of this important strategic entrepreneurial action. Prior research on pivoting has highlighted the psychological consequences of pivoting for entrepreneurs' identity (Grimes, 2018) and passion (McMullen, 2017). Other studies have identified stakeholders as a source of resistance to pivoting (Snihur and Clarysse, 2022; Berends et al., 2021). One study (Burnell et al., 2023) examined drivers of pivoting, finding that factors that enhance breadth of experience (entrepreneurial experience, startup mentoring, and larger team size) can enable pivoting. Anchored in COR, our research extends such work by newly theorizing stress-related micro-processes (rumination, active coping) as driving forces of pivoting. This is important because the specific antecedents of pivoting—other than the need or desire to make the venture more competitive and factors relating to breath of experience—are poorly understood (Chaparro and Gomes, 2021). Indeed, our study and theorizing specifically highlight a psychological stress-related process as a driver of pivoting, that is, pivoting out of necessity to survive and manage entrepreneurs' strain in a crisis. This complements the dominant positive perspective in which pivoting is a way to optimize venture performance and to thrive (Ries, 2011; Pillai et al., 2020; Kirtley and O'Mahony, 2020). Our paper paves the way for future research to explore rumination that might follow from other crises; such as the loss of co-founders' passion (McMullen, 2017) or the loss of key resource providers (e.g., Hampel et al., 2020; McDonald and Gao, 2019). In these situations, pivoting as an active coping strategy might counterintuitively lead to a negative pivoting spiral that eventually could compromise venture survival. We hope future research can shed light on such possible dark sides of rumination-triggered pivoting.

Further, existing research on pivoting mainly considers pivoting during venture creation (Chaparro and Gomes, 2021). This study extends research into pivoting by considering the pivoting of existing businesses. As economies seek out new sources of productivity and are dominated by small businesses that are typically entrepreneur led (OECD, 2017), we encourage more research to be conducted on pivoting by existing businesses. Specifically, we call for research on the antecedents of pivoting by these businesses. For instance, is the strain of a crisis required to stimulate the entrepreneurs leading these businesses to make changes to their business model, or are there other, perhaps more positive, psychological drivers?

At the same time, we caution that while pivoting is often presented as “good” and functional, including in crises (Morgan et al., 2020), more robust empirical evidence is needed on the longer-term effects of pivoting for firm survival and performance.

4.4. Implications for regulatory focus theory in entrepreneurship: Trait prevention focus can support entrepreneurial action

Our research contributes to the literature on entrepreneurs' regulatory focus. This literature typically focuses on promotion focus and suggests that promotion-focused entrepreneurs are the “winner-takes-all” of entrepreneurship, whereas entrepreneurs with a prevention focus are disadvantaged in terms of their responses to environmental dynamics (Hmieleski and Baron, 2008; Brockner et al., 2004). We complement this research by offering a stress-based explanation (drawing on COR theory, Hobfoll et al., 2018) to theorize that the sensitivity to losses that is embedded in a prevention focus has an important *enabling* effect in a crisis context to mobilize entrepreneurial action. Specifically, in our study, a prevention (relative to promotion) focus strengthened the effect of crisis rumination on entrepreneurs' action (both active coping and pivoting).

In the context of a crisis, inaction can perpetuate the loss of psychological resources due to ongoing rumination, leading to still further resource losses (e.g., income) by the business. Therefore, our model provides a nuanced understanding of when prevention-focused entrepreneurs will take action to minimize resource losses (Ciuchta et al., 2016). By examining the moderating effect of regulatory focus on the relationship between rumination and entrepreneurial action, our research subscribes to a strand of literature that explores how prevention self-regulation can influence entrepreneurs' actions (Baas et al., 2011; Ciuchta et al., 2016), especially during a crisis. Our theoretical account newly integrates arguments from COR with a prevention (relative to promotion) focus to emphasize stress-based processes. Finally, by studying self-regulatory focus in the context of a crisis, our research complements the extant literature which investigates the importance of entrepreneurs' regulatory focus for their daily entrepreneurial behaviors (Tumasjan and Braun, 2012; Kammerlander et al., 2015).

4.5. Practical implications

Our first practical implication is that crisis rumination can be conducive to pivoting; entrepreneurs should therefore treat crisis rumination as an element of their strategizing when they are dealing with stressful situations like inflation. Since crisis rumination provides entrepreneurs with insights into the relevance of a stressful event for their business, it can help to spur entrepreneurs to generate solutions for the stressful situation and to act upon these. Prior research counsels entrepreneurs to avoid rumination since it is associated with negative affect and inhibits stress recovery (Williamson et al., 2021), but in a crisis it may not be possible for entrepreneurs to avoid ruminating about the crisis. Therefore, it may be useful for entrepreneurs to acknowledge crisis rumination as a natural part of their crisis response and consider how it may shape their decisions and actions like pivoting during a crisis. When rumination is acknowledged and expected in the face of negative events/crises, it can be managed and leveraged to generate the cognitive and energetic resources that help produce entrepreneurial action (active coping and pivoting).

Second, while our findings suggest that the psychological strain involved in crisis rumination helps to support entrepreneurial action, we also caution that entrepreneurs should be aware of the potential negative impacts of crisis rumination on their well-being and mental health (Wach et al., 2021). There is much scope to develop and offer well-being and mental health support to entrepreneurs who ruminate intensely about a crisis. Such support could take different forms, including accelerators, tech transfer office, government entrepreneur support agencies and mentors facilitating access to professional coaches, talking therapies, or self-guided online resources. Mentors, coaches, and board members providing guidance to entrepreneurs amid crises should actively assist them in recognizing their crisis rumination patterns, as these can significantly influence their coping mechanisms and decision-making processes during a crisis. Therefore, we highlight that acknowledging the pros and cons of crisis rumination is essential to leverage it effectively for decision-making and action.

Third, when entrepreneurs ruminate during a crisis, they are more prone to engaging in active coping strategies, particularly those with a high prevention focus. It is crucial for these entrepreneurs to understand their natural tendencies in thought and action during crisis. Entrepreneurs leaning toward prevention focus can harness their repetitive thoughts to thoroughly analyze the stressful situation. Yet these entrepreneurs should also be aware of their proclivity toward action and that action (e.g. pivoting) could also have negative outcomes. Thus, to enhance the quality of their decision-making, they should reflect on the potential impact of their actions on the venture's stage of development, potential stakeholders, or the co-founder's commitment. They may also seek advice from more promotion-focused co-founders, mentors, or advisors to fully consider all action options. Therefore, we recommend that entrepreneurs cultivate self-awareness regarding their personal regulatory foci to leverage crisis rumination to its full potential.

4.6. Limitations and future research

As with all studies, the current study has limitations that also provide opportunities for future research. First, participants recruited from Prolific may share some unobservable characteristics (e.g., an interest in answering survey questions for academic purposes). We suggest future research addresses these sampling limitations and further explores the effect of rumination on entrepreneurs' actions by using another sampling approach, such as using other platforms and contexts to collect data.

Second, we found that active coping mediated the relationship between crisis rumination and pivoting; however, we also found that the indirect effect of active coping was partial and the effect sizes were relatively small. Future research could therefore examine other mediators such as risk attitudes (Block et al., 2015) to provide a nuanced understanding of why crisis rumination enhances pivoting. Future research should also take into account the temporal component of crisis rumination by examining how long it might take an entrepreneur who is ruminating about a stressful event to pivot.

Third, crisis rumination might influence other decisions and behaviors of entrepreneurs. For example, crisis rumination is a resource-intensive process, and entrepreneurs may seek to alleviate this strain by resorting to actions that minimize resource losses. Consequently, entrepreneurs might be inclined to engage in unethical pro-organizational behavior—actions perceived as unethical by societal standards but undertaken with the intention of securing benefits for the organization (Lee et al., 2019). Additionally, crisis rumination might enhance a sense of loss of control that can lead to dysfunctional behaviors to regain a sense of control (Cutright, 2012). Research indicates that in response to a perceived loss of control, individuals may attempt to regain a sense of control by accumulating personal possessions (Cutright et al., 2013) or even hoarding personal possessions (Hartl et al., 2005). Consequently, crisis rumination may influence entrepreneurs' investment decisions, potentially increasing expenditure of resources for peripheral or even non-businesses purposes. Both unethical pro-organizational behavior and investment decisions play pivotal roles in shaping the landscape of entrepreneurship (Guarana et al., 2022; Tacke et al., 2023). As such, future research stands to gain valuable insights by delving into these outcomes of crisis rumination while enhancing understanding of the destructive side of entrepreneurship (Shepherd,

2019).

Fourth, while our research has explored the influence of entrepreneurs' personality traits, specifically prevention focus, on the impact of crisis rumination on pivoting decisions, future research should consider venture team dynamics and composition. The venture team comprises individuals primarily responsible for strategic decision-making in the venture (Lazar et al., 2020). Given that venture teams, particularly those in new ventures, are often characterized by their small size and intensive collaboration among members, the team context is likely to exert a considerable influence on the decision-making dynamics of its individual members (Lazar et al., 2020; Tacke et al., 2023). Therefore, we encourage future research to explore crisis rumination in the context of venture teams and how it may shape entrepreneurs' pivoting.

Finally, following the recent literature, we acknowledge that while pivoting is likely to be an important entrepreneurial strategic decision in times of crisis (Manolova et al., 2020; Paeleman et al., 2024) and might bring about positive outcomes (Kirtley and O'Mahony, 2020; Pillai et al., 2020), it comes with costs and might also lead to failures. As such, future research should explore more systematically the outcomes of pivoting in relation to crisis rumination.

5. Conclusion

Entrepreneurs' responses to crises can vary, with some proactively taking steps to adapt and others more inclined to adopt a wait-and-see approach. In this study, we have introduced and tested a micro-level model that integrates COR theory with insights from research on crisis rumination. Our stress-based theoretical model aims to elucidate how and why certain entrepreneurs actively cope and pivot their business in response to a crisis. Our results, derived from an experiment and a longitudinal survey, indicate that entrepreneurs are more likely to engage in active coping and pivot their businesses when they experience higher levels of crisis rumination. This stress-induced response is particularly likely to translate into entrepreneurial action for entrepreneurs who have a trait regulatory focus geared toward loss prevention (vs. promotion).

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CRediT authorship contribution statement

Bach Nguyen: Writing – review & editing, Writing – original draft, Methodology, Formal analysis, Conceptualization. **Hai-Anh Tran:** Writing – review & editing, Writing – original draft, Methodology, Formal analysis, Conceptualization. **Ute Stephan:** Writing – review & editing, Writing – original draft, Methodology, Conceptualization. **Ha Nguyen Van:** Writing – review & editing, Resources. **Pham Thi Hoang Anh:** Writing – review & editing, Resources.

Declaration of competing interest

There is no conflict among co-authors in this paper.

Data availability

Data will be made available on request.

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Appendix A. Supplementary data

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