

Termination of Nascent Entrepreneurship: The Central Effects of Action Crisis in New Venture Creation

Stela Ivanova
ESCP Business School, London, UK
&
Erno T. Tornikoski
University of Exeter Business School, UK

ABSTRACT

Because current conceptualizations are insufficient with respect to explaining the termination subprocess of nascent entrepreneurship, little is known regarding the liminal space in which the decision between termination and persistence is made. To solve this problem, we apply the *Theory of Action Phases*, extend it using the notion of an *action crisis*, and propose that (i) the extent to which nascent entrepreneurs experience action crises informs the decision between persistence and termination and (ii) the odds of experiencing an action crisis and the temporal length of an action crisis phase depend largely on the goal-directed actions that have previously been taken. We test and find empirical support for our main hypotheses by reference to a harmonized dataset drawn from the Panel Study of Entrepreneurial Dynamics (PSED). These findings contribute to both theoretical and practical advancements in the field of nascent entrepreneurship and research on entrepreneurial action. With respect to research, the inclusion of the notion of action crisis allows us to conceptualize termination as a subprocess of nascent entrepreneurship and to explain decisions between termination and persistence in the context of new venture creation. By taking the time-saving and time-delaying effects of actions into consideration, our study also offers a more nuanced view of entrepreneurial action given that the length of an action crisis is informed by the actions of planning and implementation that have previously been taken. In practical terms, we address some lasting problems that arise in the context of entrepreneurship-focused public policies and provide practical advice for nascent entrepreneurs.

Keywords: Nascent entrepreneurship, Termination, Persistence, Action crisis, Theory of action phases, PSED

1 Introduction

The separation of persistence and termination in nascent entrepreneurship has been a longstanding research objective since the early 2000s (Shane et al., 2003) in the literature on goal striving in general (Brandstätter et al., 2013) and in the literature on nascent entrepreneurship in particular (Shepherd and Gruber, 2021; Wood et al., 2019). To achieve this research objective, scholarship requires both conceptual and empirical insights into the subprocess of new venture creation in which the decision between termination and persistence is made. However, a recent review by Davidsson and Gruenhagen (2021) indicated that despite growing interest in the subprocesses of new venture creation, termination has been explored by only two of the 51 subprocess articles included in the review. This limited attention on new venture termination is somewhat surprising considering the growing interest in studying termination at later stages of the entrepreneurial journey, such as entrepreneurial exit from already established firms (DeTienne, 2010; DeTienne et al., 2015; Leroy et al., 2015; Piva and Rossi-Lamastra, 2016) or exit from entrepreneurship as a career path (Hsu et al., 2016; Morris et al., 2020; Stam et al., 2010). Furthermore, the literature examining termination and persistence in the context of nascent entrepreneurship has tended to consider these alternatives to be mutually exclusive events (Brush et al., 2008; Delmar and Shane, 2004). Accordingly, persistence has usually been treated as a success outcome and termination as a failure outcome (Arora and Nandkumar, 2011), and termination has been explained as the negation of persistence (Davidsson and Gordon, 2012; DeTienne et al., 2008). This approach has been criticized as overly simplistic (Wicker and Davidsson, 2015) in light of the evidence suggesting that persistence decisions can be observed in conditions of underperformance and chronic failure (DeTienne et al., 2008); hence, persistence cannot be equated to success. Moreover, even if persistence has been a positive (success) outcome in some instances, evidence suggests that some factors are positively associated with both success and termination (Yusuf, 2012); hence, by viewing termination as the negation of persistence, we are unable to learn about the unique drivers of termination decisions. Overall, the subprocess of nascent entrepreneurship termination warrants its own theoretical focus.

Because nascent entrepreneurship is goal-directed behavior, in that individuals perform actions directed to the goal of creating a new venture (Frese, 2009), entrepreneurship scholars often employ Gollwitzer's (2012) theory of action phases (TAP) to adopt an action-regulation perspective on nascent entrepreneurship. According to TAP, entry into nascent entrepreneurship begins with the desire to start a business followed by the stages of search, evaluation, choice, refinement, and the implementation of ideas (Davidsson and Gruenhagen, 2021). TAP also distinguishes between goal setting in terms of the formulation of an intention and goal striving in terms of planning and implementation (Gollwitzer, 2012). The compatibility between nascent entrepreneurship and

process-level theorizing offered by TAP renders TAP particularly suitable for examining distinct subprocesses of goal-directed nascent entrepreneurship. In this regard, previous research has used TAP to study the opportunity development subprocess (Delanoë-Gueguen and Fayolle, 2019; Van Gelderen et al., 2015) and to map the active, effortful pursuit of goal attainment from the stage of setting a goal for a new venture to that of taking planning and implementation actions to achieve this goal (Van Gelderen et al., 2018). Simultaneously, the original model proposed by TAP has been criticized as insufficient to explain the termination of goal pursuit (Brandstätter et al., 2013; Ghassemi et al., 2017) and has not yet been applied to study the transition between termination and persistence in the context of new venture creation. In this study, we echo this criticism in the nascent entrepreneurship literature and endorse Brandstätter's inclusion of the notion of *action crisis* in study of nascent entrepreneurship.

An action crisis is characterized by disengagement from goal-directed actions and conflict between the opposing forces pushing towards holding on to or letting go of a personal goal (Brandstätter et al., 2013; Ghassemi et al., 2017; Wrosch et al., 2003). Indeed, nascent entrepreneurship is permeated by phases of action crisis triggered by the unique conditions of uncertainty, limited feedback, and complexity as well as the associated problems and obstacles (Baron et al., 2016; Davidsson and Gordon, 2016; Funken et al., 2020; McMullen and Shepherd, 2006). Furthermore, action crises with respect to highly important goals, such as that of creating a new venture, typically last several months (Herrmann et al., 2014) and may result in persistence, restarting the active pursuit of new venture creation, or termination of that process (Allen et al., 2020; Davidsson and Gordon, 2016). However, the temporal aspect of action crisis, that is, the time spent disengaging from goal-directed actions, has not been observed in sufficient detail due to the limited availability of longitudinal research (Brandstätter et al., 2013; Brandstätter and Herrmann, 2016; Herrmann and Brandstätter, 2013). Because current conceptualizations are insufficient to explain the termination subprocess of nascent entrepreneurship, the main objective of this study is to integrate the decision between persistence and termination into the context of new venture creation by extending TAP with the notion of action crisis.

Our theorizing, intends to demonstrate that considering termination to be a subprocess of nascent entrepreneurship rather than a negation of persistence offers a new way of conceptualizing this phenomenon that incorporates not merely the termination event itself but also the transition phase that precedes it. This transition phase is conceptualized as an action crisis. Accordingly, we propose that the extent to which nascent entrepreneurs experience action crisis, operationalized in terms of the time spent in an action crisis phase, informs their decision between persistence and termination (Brandstätter et al., 2013). Furthermore, we propose that the odds of

experiencing an action crisis and the temporal length of an action crisis phase depend largely on the goal-directed actions that have previously been taken (McMullen and Kier, 2016). That is, an action crisis follows from or interrupts prior planning and implementation actions. We test and find empirical support for the hypotheses of this study using a harmonized longitudinal dataset drawn from the Panel Study of Entrepreneurial Dynamics (PSED).

Our empirical findings contribute to theoretical advancements regarding the termination of nascent entrepreneurship. Most notably, we provide an empirical demonstration of the utility of extending the TAP (Gollwitzer, 2012) by using the notion of action crisis (Brandstätter and Schüler, 2013) to provide a more complete account of the termination subprocess of nascent entrepreneurship (Davidsson and Gruenhagen, 2021). The inclusion of the notion of action crisis accounts for the time in venture creation during which the decision between termination and persistence is made. As action crises can occur on multiple occasions during new venture creation, our study contributes by highlighting an aspect of persistence that has previously been overlooked, namely, the restarting and renewal of venture creation efforts following an action crisis (Davidsson and Gordon, 2016). While previous entrepreneurship literature has considered persistence in terms of the sustainment of venture creation efforts (Hoang and Gimeno, 2010; Shook, 2003; Tietz et al., 2021), our conceptualization relates persistence more closely to resilience (Allen et al., 2020; Youssef and Luthans, 2007) and the lean startup options of pivot and perseverance (Ries, 2011; Shepherd and Gruber, 2021). In addition, our study has implications for entrepreneurial action theory (Chandler et al., 2011; Giménez Roche and Calcei, 2021; Mansoori and Lackéus, 2020). We explore the implications of actions with respect to predicting and informing the termination subprocess of nascent entrepreneurship (Brettel et al., 2012; Furlotti et al., 2020; Wiltbank et al., 2009) and focus on the temporal dynamics associated with specific actions (Lévesque and Stephan, 2019; McMullen and Dimov, 2013). Our study thus incorporates a more nuanced view of entrepreneurial action by taking the time-saving and time-delaying effects of actions into consideration since the length of an action crisis is informed by the actions of planning and implementation that have previously been taken.

2 Theory and hypothesis

2.1 Theory of action phases and action crisis

The theory of action phases (TAP) (Gollwitzer, 2012) conceptualizes the process of goal attainment in terms of a temporal, horizontal path that starts with a person's desires, which inform goal setting, and concludes with an evaluation of the outcome after the goal has been achieved or terminated. (Gollwitzer, 2012, 1990; Heckhausen

and Gollwitzer, 1987). TAP distinguishes among four phases of this process: goal setting, planning, implementation, and evaluation after the goal has been achieved or terminated. These phases are separated by clear boundaries between the deliberative and volitional mindsets (Achtziger and Gollwitzer, 2018). The dominant mindset during each phase is conducive to the specific task that the individual faces during that phase.

From the perspective of TAP, entry into nascent entrepreneurship signals that an individual, a nascent entrepreneur, has decided to pursue the goal of new venture creation (i.e., the individual has completed the task of goal setting during the deliberation phase), following which the entrepreneur starts to plan for and implement this decision by taking volitional actions (Delanoë-Gueguen and Fayolle, 2019). According to this perspective, nascent entrepreneurship is conceptualized as a goal-directed process that entails volitional actions on the part of nascent entrepreneurs that are directed toward the creation of a new venture (Frese, 2009; Van Gelderen et al., 2018).

Various properties of the volitional actions taken during the process of nascent entrepreneurship have been studied in relation to the emergence of a new venture (Lichtenstein et al., 2007; Tornikoski and Newbert, 2007). For example, the number of actions taken is important for nascent entrepreneurs with respect to achieving positive cash flow (Carter et al., 1996). Additionally, the rate, concentration, and timing of actions seem to matter with respect to venture emergence (Hopp and Sonderegger, 2015; Lichtenstein et al., 2007). The performance of a new venture is also influenced by the means versus goals orientation of the early actions taken by the entrepreneur (Furlotti et al., 2020). The outcomes of the actions taken can also be used as success markers (Van Gelderen et al., 2011) to guide nascent entrepreneurs' performance expectations regarding the new venture, which inform persistence (Tietz et al., 2021). However, previous research has found that terminated and emergent new ventures resemble each other in terms of the number and type of actions performed suggesting that something other than actions causes the decision to terminate (Van Gelderen et al., 2011). Hence, a theoretical explanation of new venture creation based on volitional actions, their properties, and outcomes is insufficient to account for how and why termination occurs (Arenius et al., 2017; Carter et al., 1996; Koumbarakis et al., 2020; Shepherd and Gruber, 2021; Yusuf, 2012). Similar observations from various domains of goal pursuit in psychological research have given rise to the proposition that nascent entrepreneurship entails volitional actions as well as phases of doubt and deliberation between the options of persisting and giving up, which have been previously conceptualized in terms of *action crises* (Brandstätter & Schüler, 2013).

Following previous definitions, we conceptualize action crisis as a transitional phase in the termination subprocess, during which entrepreneurs disengage from goal-directed actions and decide between the alternatives

of termination and persistence (Brandstätter et al., 2013; Ghassemi et al., 2017; Wrosch et al., 2003). The inclusion of the notion of action crisis in the study of nascent entrepreneurship reflects evidence drawn from both everyday experience and scientific analysis (Klinger, 1987, 1975), which indicates that terminating the pursuit of important goals, such as the creation of a new venture (Hechavarría et al., 2012), does not occur spontaneously. Particularly in situations in which successful goal attainment is uncertain, the decision to terminate goal pursuit is a result of a lengthy and rather difficult cognitive and affective process that starts with removing oneself from active goal pursuit, an event which occurs well before the individual definitively makes the decision to terminate (Klinger, 1987).

Transitioning to an action crisis phase signifies a shift in individuals' goal-related cognitive orientation, that is, their mindset (Brandstätter & Schüler, 2013). While engaging in the volitional actions of planning and implementation, which are directed toward goal attainment, individuals' dominant mindsets shape their outlooks in favor of the goal (Armor and Taylor, 2003; Brandstatter and Frank, 2002). During an action crisis, on the contrary, this firm cognitive orientation toward goal attainment is attenuated, and a deliberative mindset comes to dominate as the nascent entrepreneur decides between persisting and terminating new venture creation. In addition to a specific cognitive orientation of deliberation, action crisis is also associated with specific physiological and affective experiences (Brandstätter et al., 2013). Namely, action crisis has been found to be accompanied by negative affect and depressive symptoms (Brandstätter et al., 2013; Marion-Jetten et al., 2022).

2.2 Time spent in action crisis and termination

During an action crisis, nascent entrepreneurs are faced with the motivational task of deciding whether to terminate action altogether or to restart/redirect action (Achtziger and Gollwitzer, 2018; Davidsson and Gordon, 2016; Hampel et al., 2020). Therefore, the inclusion of the notion of action crisis allows entrepreneurs to make the decision between termination and persistence.

During phases of action crisis, nascent entrepreneurs can step away from the active process of new venture creation to gain time – time to come up with an alternative path or a solution to a current problem or to regain the energy and motivation required to renew their efforts and persist by taking new actions. Renewing action and persisting with new venture creation is possible when nascent entrepreneurs find it easy to get things done without letting inaction bother them for too long (Brandstätter, 2018). In contrast, for individuals who remain paralyzed and inactive for too long, disengagement from active, effortful pursuit and alienation from the goal only

intensifies over time (Herrmann and Brandstätter, 2013), becoming more likely to result in the termination of goal pursuit (Herrmann and Brandstätter, 2015).

The transition from an action phase of planning or implementation to a phase of action crisis signifies a shift from a volitional to a deliberative cognitive orientation, which is known as a mindset shift (Brandstätter & Schüler, 2013). This mindset shift toward deliberation allows the decision to terminate to emerge as an option alongside the decision to persist (Brandstätter et al., 2013). A deliberative mindset, which deepens in the context of an action crisis, fosters an impartial evaluation of goal desirability and feasibility (Beckmann and Gollwitzer, 1987), for example, by leading to more skeptical goal evaluation (Herrmann and Brandstätter, 2015). A prolonged action crisis entails greater changes in the ways in which individuals evaluate their goal in terms of desirability and feasibility (Herrmann and Brandstätter, 2015, 2013). For example, previous research has found that an action crisis phase lasting 14 weeks leads to devaluations of goal desirability and feasibility (Brandstätter et al., 2013).

As an affective experience, action crisis is conceptualized in terms of an intrapsychic conflict that compromises both psychological and physiological well-being (Brandstätter et al., 2013). The inability to decide between terminating and persisting (retaking action) in a timely fashion has been found to increase negative affect and depressive symptoms (Brandstätter et al., 2013; Marion-Jetten et al., 2022). Similarly, Wrosch and colleagues (e.g. 2003) showed that an individual's inability to decide between termination and persistence, which should be associated with a prolonged action crisis, results in impairments to both health and well-being. In turn, emotional exhaustion and diminished well-being merely increase the likelihood of termination, as suggested by previous-research (Sardeshmukh et al., 2020). Overall, spending a longer time in an action crisis is associated with a higher likelihood of adopting a deliberative mindset and devaluing the goal of new venture creation as well as diminished well-being, ultimately increasing the likelihood of terminating the new venture creation. Accordingly, we propose the following:

Hypothesis 1: *A longer amount of time spent in an action crisis is more likely to result in termination than in persistence in new venture creation.*

Furthermore, as an action crisis is proposed as an extension of TAP (please see Figure 1), it follows from or interrupts prior planning and implementation actions. The experience of an action crisis is largely informed by the distinct cognitive processes that are operative during the stages of planning and implementation that precede an action crisis (McMullen and Kier, 2016). For example, planning has a strong reality orientation with respect to the task of defining specific opportunities to act and outline a course of action, whereas implementation has a narrow focus on information that is useful for goal attainment (Gollwitzer, 1990). Because of these differences in

information processing and decision-making characteristics, we also propose that *planning* and *implementation* affect action crisis differently.

2.3 Planning and action crisis

Engaging in planning is necessary because newly formed goals cannot be implemented immediately, for example, if an individual would like to create a new venture but is currently employed in full-time paid work or if the relevant opportunities to act have not yet become available (Delmar and Shane, 2003; Liao and Gartner, 2006; McCann and Vroom, 2015). In addition, most goals, such as that of creating a new venture, cannot be achieved in a single step. Hence, nascent entrepreneurs tend to plan for which tasks to perform, the ways in which these tasks should be prioritized, and ways of dealing with possible distractions, especially when they are required to perform several tasks simultaneously (Van Gelderen et al., 2018). During the planning stage, nascent entrepreneurs are primarily concerned with concrete, realistic information related to these questions (Gollwitzer, 1990). Accordingly, their attention is focused on the tasks of defining specific opportunities to act and specifying a course of action. By mentally linking an opportunity to act in pursuit of the goal with goal-directed behavior (e.g., ways of seizing opportunities) while planning, nascent entrepreneurs commit to their chosen course of action (Bieleke et al., 2021). However, this commitment comes at the cost of making their goal striving less flexible (Gollwitzer et al., 2008). For instance, individuals might miss good opportunities that they did not take into consideration in their plans (Masicampo and Baumeister, 2012), or their predefined opportunities to act may not be readily available. Hence, nascent entrepreneurs who engage in planning are more likely to experience a phase of action crisis that may force them to interrupt or pause new venture creation to await the emergence of the opportunities for which they have planned. Therefore, we propose the following:

Hypothesis 2a: *Planning increases the likelihood of an action crisis in new venture creation.*

In addition, the TAP suggests that while planning, people do not deliberate and weigh the positive and negative consequences of goal achievement (Gollwitzer, 2012). Instead, planning is characterized by realistic information processing regarding concrete aspects of goal pursuit. Hence, if and when entrepreneurs transition to action crisis after planning, the realistic, concrete-level cognitive orientation that carries over from the planning stage can cause nascent entrepreneurs to remain concerned with questions of when and where to restart their action. This claim is supported by previous research, which has focused on the role of planning during nascent entrepreneurship and has shown that planning is beneficial for identifying critical missing information, anticipating and preparing for various contingencies, and thus making faster decisions in a time of deliberation

(Delmar and Shane, 2003). Similarly, it has been suggested that planning enables nascent entrepreneurs to establish more proximate, concrete objectives against which they are able to judge their progress and undertake corrective actions in a timely manner (Dimov, 2010). Planning also helps nascent entrepreneurs allocate their personal resources more efficiently by outlining the critical tasks that require additional and more timely attention (Tripoli, 1998). Overall, these findings suggest that having previously engaged in planning is likely to accelerate the decision-making process during an action crisis (McMullen and Kier, 2016), as nascent entrepreneurs who plan are faster when considering alternative solutions and less likely to become immobilized for a long period of time. This finding is consistent with research showing that planning does not increase the tenacity of goal striving when working toward the goal becomes unambiguously pointless (Legrand et al., 2017). Therefore, we propose that planning has a time-saving effect on the subsequent phase of action crisis:

Hypothesis 2b: *Planning decreases the time spent in an action crisis in new venture creation.*

2.4 Implementation and action crisis

The task of *implementation*, which is occasionally referred to as the actional phase in the context of TAP, is acting to achieve goal attainment (Gollwitzer, 1990). The cognitive orientation toward action that characterizes this phase is similar to what Csikszentmihalyi (1990) called “flow experience” and Wicklund (1986) labeled “dynamic orientation”. In contrast to planning, when taking implementation actions, the individual does not reflect substantially on the qualities of the goal to be achieved, on his or her capacities to achieve that goal, or on alternative strategies for goal achievement, nor does the individual develop plans regarding when, where, and how to act (Gollwitzer, 1990). Instead, the individual is completely immersed in the actions that he or she is currently taking in swift succession with no pauses (Csikszentmihalyi, 1990). Accordingly, the actional orientation focuses attention only on those aspects of the self and the environment that sustain the current course of action, whereas any potentially disruptive aspects, such as self-reflective thoughts, competing goal intentions, and distractive environmental stimuli, are ignored. Therefore, the actional orientation associated with implementation is characterized by closedmindedness with respect to information that could trigger a re-evaluation of the goal that is being pursued, a re-evaluation of the chosen route toward goal attainment, or any form of self-evaluation. As the actional orientation indicates a cognitive attunement toward cues that guide the course of action toward goal attainment, this orientation enables people to move effectively toward goal attainment (McCrea and Vann, 2018). Applied to the context of nascent entrepreneurship, this cognitive attunement toward sustaining action and

closedmindedness to information that could induce doubt suggests that when taking implementation actions, a nascent entrepreneur is less likely to be interrupted by an action crisis. Therefore, we propose the following:

Hypothesis 3a: *Implementation decreases the likelihood of an action crisis in new venture creation.*

However, as environmental conditions can deteriorate, unexpected obstacles and problems can occur (Davidsson and Gordon, 2016; Engel et al., 2021; Kollmann et al., 2017; Van Gelderen et al., 2011), and nascent entrepreneurs can thus be forced into an action crisis, even amid intense immersion in implementation actions. When entrepreneurs recognize these negative changes, an action crisis can occur and force nascent entrepreneurs to consider whether the expected return is worth the increased exposure to risk. Before such a decision can be made, however, one must become aware of the need to make it (McMullen and Kier, 2016). This awareness can be delayed by the allocation of attention to volitional concerns, which represent the key information processed while engaging in implementation actions. Juxtaposing the decision-making of individuals during implementation with action crises, Nenkov and Gollwitzer (2012) found that individuals in the implementation phase are more self-defensive and refrain from making decisions more fiercely than individuals during a deliberative action crisis phase. Therefore, nascent entrepreneurs who have made a more effortful commitment and performed more implementation actions spend more time on the task of self-justification of their goal, thereby delaying the decision between persistence and termination. Therefore, we propose that implementation has a delaying effect on the following phase of action crisis:

Hypothesis 3b: *Implementation increases the time spent in an action crisis in new venture creation.*

Figure 1 depicts our conceptual model. This model is an adaptation and extension of the TAP model developed by Ahtziger and Gollwitzer (2018, p. 487). It highlights the inclusion of action crisis in the framework of TAP and simultaneously depicts (in solid lines) the relationships hypothesized in our empirical study.

---Insert Figure 1 about here ---

3 Method

3.1 Sample

Among various projects focusing on nascent entrepreneurship (Carter et al., 1996; Reynolds et al., 2004), the Panel Study of Entrepreneurial Dynamics (PSED) is one of the only publicly available datasets to provide longitudinal data regarding nascent entrepreneurs until the termination of their entrepreneurial efforts. Since 1993, several national PSED studies have been conducted. The dataset that we use in this study represents a harmonization of data collected in Australia (CAUSEE), which began screening in 2007-2008, China (CH-PSED),

which began screening in 2009, Sweden (SE-PSED), which began screening in 1998, and the United States (PSED I and PSED II), which began screening in 1998-2000 for PSED I and 2005-2006 for PSED II. We chose this harmonized dataset featuring five cohorts for three reasons. First, this harmonized dataset file is publicly available on the University of Michigan website (Reynolds, 2016a), thereby ensuring data accessibility and the reproducibility of research findings. Second, the five cohorts used similar procedures to track the nascent entrepreneurship process and to determine whether this process resulted in the emergence of a new venture or the founders decided to terminate their pursuit of new venture creation; simultaneously these cohorts cover diverse contexts (Shim and Davidsson, 2018), as the four countries included represent different continents as well as a variety of cultures, languages, and political systems. Third, preliminary findings have suggested that existing models of action crisis are generalizable across cultures and languages (Marion-Jetten et al., 2022) and that the psychological meaning of volitional action is similar across Western and non-Western cultures (Chatterjee et al., 2018). Therefore, by using this harmonized dataset instead of any individual country dataset, we increase the generalizability of our findings.

Each of the five studies began by screening a random sample of representative adults, asking them whether they were currently trying to start a new business, including any self-employment or selling any goods or services to others, with the aim of identifying nascent entrepreneurs. In total, 179,987 people were screened as part of the data collection efforts across the four countries. For the Australian, Swedish, and the two USA cohorts, the samples were representative of the entire country, whereas the Chinese sample was drawn from eight cities that were selected at random to represent four major regions of the country. The harmonized PSED sample included 3,910 participants. After we followed the recommended data cleaning steps (Reynolds, 2016b) (see Appendix 1 for details), the sample was reduced to 2,536 nascent entrepreneurs, of which 926 reported termination and 750 reported venture emergence. The remaining 860 cases were censored, i.e., we observed neither termination nor emergence.

Missing data regarding some of the independent variables and/or controls left a usable sample size for most study models of $N = 2,242$. We estimated the distributions of basic demographic covariates, such as education, gender, and age, both before and after the exclusion of missing cases. We found no differences between the distributions of the two sets. Furthermore, we estimated the final study model, replacing all missing values with sample means, and found no difference in the size and direction of the uncovered effects. Therefore, we are confident that removing cases with missing variables did not introduce detectable biases to our results.

3.2 Data structure

The data gathered concerning each nascent entrepreneur indicated the history of his or her new venture creation process. The beginning of this history is indicated by the conception date, that is, the date of the first of two actions undertaken by the nascent entrepreneur within a 12-month period (Reynolds and Curtin, 2011). Specifying the start of new venture creation in this way indicates that the nascent entrepreneur has completed the goal-setting phase and transitioned to the volitional phase of nascent entrepreneurship. The conception date is captured by the variable *CPT_MY*. The end of the observed history is signified by the realization of a binary outcome (Dimov, 2010): either the new venture creation attempt is terminated or it leads to the emergence of a venture, which is most frequently operationalized by scholars in terms of reaching profitability (Davidsson and Honig, 2003; Edelman and Yli-Renko, 2010) (see the conceptual model shown in Figure 1). The history of one's new venture creation attempt from conception to termination or venture emergence is divided into phases of action and action crisis. In this way, the data structure allows for multiple iterations of phases of actions and action crises within one venture creation attempt.

An action phase represents a continuous period during which the nascent entrepreneur performs planning and implementation actions; it indicates goal striving according to the TPA (Gollwitzer, 2012). An action crisis phase is a continuous period during which the nascent entrepreneur does not perform any new actions. Each phase of action as well as each phase of action crisis is delineated by a separate observation. Hence, our data have a clustered structure and represent multiple observations per participant. The number of observations is unbalanced across participants, with a maximum number of 20 observations per participant, that is, ten observations of the action crisis phase ($M = 3.87$, $SD = 1.73$) and ten observations of the action phase ($M = 3.87$, $SD = 1.78$). We provide a distribution of the number of action and action crisis phases across participants in Appendix 2.

The time spent in an action phase or an action crisis phase is measured in months. We set two months as the minimum length of time required to delineate an action crisis phase. Previous studies on action crises in the psychology literature related to goal striving have similarly observed action crises by reference to periods of two months (Holding et al., 2022; Kambara et al., 2019). In addition, by specifying the minimum length of time without taking action required for a phase to be coded as an action crisis as two months, we also accommodate any reporting errors regarding the exact time when a specific action was performed. We set an alternative specification of one month as the minimum length of time required to delineate an action crisis phase. We repeated all analyses using this alternative specification. The results are reported in Section 4.2. The average amount of

time spent in an action phase is $M = 1.83$ ($SD = 1.45$), whereas the average time spent in an action crisis phase is $M = 11.95$ ($SD = 14.64$).

In this study, control variables at the individual level are fixed across all within-individual observations – for example, the entrepreneur’s gender and the R&D focus of the new venture. The unique values that represent each within-individual observation are *action phase* (zero if action crisis) and *action crisis time*, which are measured in months. Each action phase is also associated with unique values of the planning and implementation variables. We impute an individual’s planning and implementation values forward for observations of the same individual during the subsequent action crisis phase.

Finally, each phase can result in one of the following outcomes. An action phase can result in the termination of new venture creation efforts, the emergence of a new venture, or an action crisis phase. An action crisis phase can result in persistence, that is, another action phase, the termination of new venture creation efforts, or the emergence of a new venture.

3.3 Main measures

Appendix 3 contains information regarding the measurements of all study variables. Table S2 provides definitions of all variables and refers to the PSED codes for each variable as per the codebook associated with the harmonized dataset. Three of the variables included in Table S2 were constructed based on the dates of events reported in the PSED. Figure S1 in Appendix 3 illustrates these three constructed variables.

Dependent variable. Our dependent variable is a categorical variable ranging from zero to three. Each category represents one of the four possible outcomes: (0) persistence; (1) termination; (2) emergence; and (3) censoring. *Persistence* is conceptualized in terms of renewed effort and the phenomenon of taking action following an action crisis. Persistence can be observed multiple times throughout the new venture creation process. With respect to the five cohorts included in the PSED, a participant indicated termination as a self-report that they had stopped working on the venture. Across the participant’s history of new venture creation, a termination outcome can occur only once. The USA PSED I and CAUSEE cohorts identified termination based on nascent entrepreneurs’ self-reports that they and any potential co-founders had stopped working on the venture. The CH-PSED, SE-PSED, and USA PSED II cohorts identified termination based on nascent entrepreneurs’ self-reports that they had stopped working on the venture; however, their co-founders might still have been working on the venture. Among the USA PSED II participants who terminated, only 8 percent reported that other people were still working on the venture (Yang and del Carmen Triana, 2017). Furthermore, when asked why others were still working on the

venture, the two most popular reasons given by participants were that ‘*they enjoy the work/want to do it*’ and ‘*they are holding out/not ready to give up*’. If the participant reported that they had stopped working on the venture but that others were still doing so, we treated the observation as terminated. *Emergence* is operationalized in terms of reaching profitability, such that “monthly revenues exceed monthly expenses for six out of 12 months; including salaries for the managers” (Hopp and Greene, 2018). Finally, *right-censored* observations refer to situations in which neither emergence nor termination had been achieved at the end of the observation period (Caliendo et al., 2010).

Independent variables. Action crisis. Two variables capture the nature of the phase (action or action crisis) and the length of the phase. A binary variable *action phase* indicates whether a phase represents an action phase (1) or an action crisis phase (0). A second variable, which is labeled *action crisis time*, represents the duration of the action crisis phase; this variable is measured in months and thus represents a count variable. The action crisis time has a value of zero for all observations that indicate action phases.

Planning and implementation. We identified all actions performed during the process of new venture creation (Mueller et al., 2012) and recorded by the PSED. As our observations were limited to actions that appeared in all five original datasets, some planning or implementation actions could have been missing from the list; however, the actions included in the five datasets were likely to be the most important actions (Shim and Davidsson, 2018). We identified 16 actions that could be harmonized among the five cohorts. We constructed planning and implementation variables based on these 16 actions. We improved the temporal representativeness of these variables by summing the number of actions performed during a particular action phase.

Planning. We followed the approach suggested by Dimov (2010) and measured planning as the sum of three indicators indicating whether the nascent entrepreneur: (1) had begun a business plan; (2) had made efforts to define markets to enter; and (3) had developed projected financial statements. Hence, our measure of planning ranged from zero to three, depending on the number of planning actions performed by the nascent entrepreneur during the action phase in question.

Implementation. We summed all remaining 13 actions into one implementation variable. This approach has commonly been applied in previous entrepreneurship research based on PSED data (Crawford et al., 2015; Koumbarakis et al., 2020; Lichtenstein et al., 2007). The 13 actions included development of model, prototype; investment of one’s own money; working full-time (35+ hours a week) on the start-up; organizing the start-up team; hiring an employee; purchase of materials, supplies, and parts; promotion of products or services; leasing or acquiring major assets; listing the venture in a phone book; obtaining supplier credit; acquiring a business

registration number; asking for formal funding; and filing for a patent, copyright, or trademark. As in the case of planning, we measured implementation on a scale ranging from zero to 13 depending on the number of implementation actions performed by the nascent entrepreneur during action phase in question.

3.4 Control variables

Left truncation. In the harmonized PSED, nascent entrepreneurs have been exposed to the risk of terminating their ventures before being included in the study. Thus, the sample features delayed entry and is characterized by left truncation (Yang and Aldrich, 2012). To account for left truncation, we calculated the time spent in new venture creation before the participants were screened in the study and included this value as a control variable in our analyses, which we termed *Screen time* (Hechavarría et al., 2016).

Country. The harmonized PSED dataset combines data from five cohorts (CAUSEE; CH-PSED; SE-PSED; U.S. PSED I and II) and represents nascent entrepreneurship in four different countries (Reynolds, 2016a). We controlled for the country in which the participant was located as indicated by the country phone code of the participant. We included *Australia*, *China*, and *Sweden* in the main models, with the *United States* being the omitted base country.

Industry. We designated a set of control variables indicating the industry in which the new venture is to operate due to potential differences in the actions required by different industries. An industry's turbulence, barriers to entry/exit, and competitive landscape could also impact the outcomes of new venture creation (Brannon et al., 2013), so we included dummy variables for (1) *extractive*, (2) *transforming*, (3) *business-service supplying*, and (4) *consumer-oriented* industries (Hechavarría et al., 2016).

Sales of products and services can have an important influence on the outcomes of new venture creation (Hechavarría et al., 2016). As positive performance indicators (Newbert and Tornikoski, 2012), sales may have an adverse effect on the individual's willingness to terminate new venture creation. Nevertheless, making sales does not in itself indicate that a new venture has emerged because some nascent entrepreneurs make their first sale even before they have recognized an entrepreneurial opportunity (Davidsson, 2006). In our analyses, we included a control variable indicating whether the nascent entrepreneur had received any income from sales of products or services (*SALES_AW*).

External funding. The type of funding received by the nascent entrepreneur during new venture creation has a direct effect on the likelihood of venture emergence or termination (Hechavarría et al., 2016). Nascent entrepreneurs who have received funding might have external obligations to funding institutions as well as a larger

safety cushion of resources; hence, they are able to postpone action crises and even termination. Therefore, we also included a binary variable indicating whether the nascent entrepreneur had received any external funding (*GETFNDAW*).

An indicator of *team size* has been used as a proxy for the resources that are available to nascent entrepreneurs (Wezel et al., 2006). Research has shown that team size has a negative effect on termination (Carroll and Hannan, 2000). Therefore, we included team size (*TM_SIZEH*) as a control variable in our models to capture the potential impact of the number of people involved in the new venture creation.

R&D focus in spending tends to result in new products or process efficiencies, creating competitive advantage and enhancing new venture performance (Le et al., 2006); it also influences the speed and type of the actions that new ventures take (Zahra and Bogner, 2000). Therefore, we controlled for the nascent entrepreneur's R&D spending focus (*RD_FOCUS*) with the following question: "Will spending on research and development be a major priority for this (new) business?" A dummy variable that was given a value of one was included in the event of a positive response (zero otherwise) (Muñoz-Bullón et al., 2020).

High-tech. According to Cefis and Marsili (2011), the initiation of a technology-based venture requires a higher level of persistence when facing difficulties and simultaneously entails a higher risk of termination. We included a high-tech variable in our model as a dichotomous variable that was coded as one when an affirmative answer was given to the question "Would you consider this business to be hi-tech?" and zero otherwise (*HI_TECHQ*).

Education. Human capital can affect the outcome of the new venture creation process (Gimeno et al., 1997) and can represent a reason why nascent entrepreneurs behave differently and make different decisions during this process (Brinckmann and Kim, 2015). Therefore, as an important control variable, we included education as a dichotomous variable indicating whether the participants had a university degree (1) or not (0) (*TMI_EDUC*).

Age. Older nascent entrepreneurs are more likely to reach outcomes quicker (Brockhaus and Horwitz, 1986), so we also controlled for the nascent entrepreneurs' age. We followed the suggestions of Hechavarría et al. (2016) and used a series of five binary variables to control for the age of the nascent entrepreneur (18–24, 25–34, 35–44, 45–54, 55–99) (*TMI_AGE*).

Gender. We controlled for the nascent entrepreneur's gender, which was coded as one for men and zero for women (*TMI_SEX*).

4 Results

Table 1 provides descriptive and correlation statistics for all variables used in our hypothesis testing. While our overall sample included 15,408 observations of action and action crisis phases clustered across 2,536 nascent entrepreneurs, each analysis used only a subset of these observations due to a variety of sample restrictions. We implemented robust standard errors clustered at the individual level to account for nonindependence in errors (Froot, 1989). Using clustered robust standard errors allowed us to produce estimates that adequately account for the clustered structure of our data (McNeish et al., 2017)

---Insert Table 1 about here ---

Before we tested our hypotheses, we explored the baseline function of including the action crisis phase as a transition to termination. We found that among the 926 cases of termination, in 804 (87%) cases, nascent entrepreneurs terminated the efforts after a phase of action crisis and that termination followed an action phase in only 122 cases (10.2%). A nonparametric one-sample binomial test of cases of termination revealed that the proportion of termination outcomes following an action crisis was significantly higher than the proportion of termination outcomes following an action phase ($p < 0.001$).

Subsequently, we applied a logit model to examine two of the four categories of our dependent variable, i.e., termination versus emergence, to investigate whether action crises allowed us to distinguish between terminated and emerged ventures meaningfully (see Table 2). In the logit model of termination, we reported the relative effects on the odds ratio (if β is the logit coefficient, then $\exp(\beta)-1$ is the relative effect on the odds ratio.). The results indicate that action crisis increases the odds of termination versus emergence by 79% ($\beta = -1.55$, $SE = 0.16$, $p < 0.001$). This effect is stable when controlling for the number of planning and implementation actions performed. The effects thus reported are negative because the action phase variable is coded as one (the action crisis phase is coded as zero). These results support the inclusion of the notion of action crisis as a transitional phase in the termination subprocess.

---Insert Table 2 about here ---

4.1 Results. Hypothesis testing

Next, we tested Hypothesis 1, i.e., the claim that a longer amount of time spent in an action crisis is positively associated with an increase in the odds of termination versus persistence. The average amount of time spent in an action crisis resulting in termination outcome is $M = 12.01$ ($SD = 13.30$) months, whereas the average amount of time spent in an action crisis following which the nascent entrepreneur restarted action to persist in the process of new venture creation is $M = 7.81$ ($SD = 9.16$), based on standard errors clustered at the individual level. To test our hypothesis, we investigated which nascent entrepreneurs terminated their new venture creation attempts using a multinomial logit model. Table 3 provides the results from multinomial logit model analysis with baseline outcome persistence. The results support Hypothesis 1, as a longer amount of time spent in an action crisis increases the odds of termination versus persistence ($\beta = 0.02$, $SE = 0.0017$, $p < 0.001$). Increasing the amount of time spent in an action crisis by one standard deviation increases the probability of terminating versus persisting by 2 percentage points. This result is robust when controlling for planning and implementation actions. Furthermore, neither planning nor implementation significantly influences the odds of termination versus persistence. This finding supports our baseline assumption that the outcomes of termination and persistence cannot be predicted by reference to the actions previously taken.

---Insert Table 3 about here ---

Subsequently, we tested Hypotheses 2a, 2b, 3a, and 3b (i.e., the hypotheses regarding the effects of planning and implementation on action crises). Our measurement of action crisis time represented an overdispersed count variable ($M = 5.53$, $\sigma^2 = 136.57$) with a substantial number of zero values (i.e., instances in which action phases are assigned a value of zero with respect to the action crisis time variable). The nonnegative integer values of action crisis time represent the number of months spent in an action crisis phase. Several regression techniques facilitate the analysis of dependent variables with this characteristic. William and Greene (1994) proposed using the Vuong test (Vuong, 1989) to select between a zero-inflated negative binomial (ZINB) and a simple negative binomial regression model (NBREG). Despite many previous citations, more recent work by Wilson (2015) has shown that the Vuong test is inappropriate for testing zero inflation. Despite these criticisms, we conducted a Vuong test (Desmarais and Harden, 2013) to confirm our decision between a ZINB and an NBREG. A significant z-test ($z = 21.55$; $p < 0.000$) suggested that the ZINB was preferable to the NBREG. Accordingly, we use information criteria to choose between ZINB and NBREG model specifications. For ZINB,

$LL = 13,559$, $df = 45$, $AIC = 63656.43$, $BIC = 63994.59$; for NBREG, the same statistics are $LL = 13,559$; $df = 23$; $AIC = 64804.9$; $BIC = 64977.74$, thus indicating that ZINB provides a better fit to our data than NBREG. We also tested whether a Poisson model would be preferable for the distribution of a given number of months (Cameron and Trivedi, 2010). A likelihood ratio test (for $\alpha = 0$) suggested that ZINB is significantly better suited than a Poisson regression ($\chi^2 = 0.000$). Overall, in comparison to NBREG and Poisson regression, ZINB exhibits the best model fit statistics.

The ZINB technique combines a logistic model that predicts a binary outcome of zero with a model that predicts the value for all nonzero outcomes. The model thus predicts both the likelihood of an action crisis occurring at all via the logit part of the model and the expected number of months spent in an action crisis via the truncated at zero count part of the model (Cameron and Trivedi, 2010). Additionally, we use robust standard errors in all hypothesis tests to address potential issues of heteroscedasticity and the clustered structure of our data. The results of the ZINB featuring action crisis time as a dependent variable are reported in Table 4.

The logit column is shown Table 4. Model 2 indicates that planning exerts a negative and significant influence on the probability of the action crisis time variable having a value of zero, indicating an action phase. In other words, an increase in the number of planning actions is positively associated with the likelihood of the nascent entrepreneur experiencing an action crisis, that is, taking no actions for a minimum of two months ($\beta = -0.04$, $SE = 0.0079$, $p < 0.001$). An increase of one standard deviation in the number of planning actions increases the odds of experiencing an action crisis by 3.92%. This finding supports Hypothesis 2a. Simultaneously, we find that implementation exerts a positive and significant influence on the probability of the action crisis time variable having a value of zero; hence, an increase in the number of implementation actions is negatively associated with the probability of the nascent entrepreneur experiencing an action crisis ($\beta = 0.04$, $SE = 0.0034$, $p < 0.001$). An increase of one standard deviation in the number of implementation actions, for example, taking two more implementation actions ($SD = 1.96$), leads to a decrease in the odds of experiencing an action crisis of approximately 4%. Accordingly, we find support for H3a.

The negative binomial column for the same model shows that planning negatively and significantly influences action crisis time ($\beta = -0.07$, $SE = 0.02$, $p < 0.01$), thereby supporting H2b. The results also indicate a positive effect of implementation on action crisis time; that is, an increase in the number of implementation actions is associated with an increase in action crisis time ($\beta = 0.02$, $SE = 0.01$, $p = 0.09$). Hence, H3b is also supported. The size of these effects is best interpreted by transforming the coefficients into incidence rate ratios (IRRs). The IRR of planning is 1.07, suggesting that the expected number of months in an action crisis increases by 7% on

average given a one-unit increase in planning actions. The IRR of implementation is 1.02; hence, the number of months in an action crisis decreases by 2% given a two-unit increase in implementation actions.

The estimated coefficients of the control variables shown in Table 4, Model 3, highlight some interesting effects. For example, we find that larger teams tend to spend less time in action crises, as do participants from China and those under the age of 25. In the opposing direction, participants who have received some external validation of their venture by making sales or obtaining external funding tend to spend more time in action crises. The estimated coefficients of the control variables are in line with previous findings (Carroll and Hannan, 2000; Gimmon and Levie, 2010).

---Insert Table 4 about here ---

4.2 Robustness of results

To assess the robustness of the main results, we conducted additional analyses and tests concerning the issue of endogeneity. The issue of endogeneity has received increasing attention in management research (Antonakis et al., 2010). This issue refers to the joint determination of the explanatory variables and the variables being explained, which generally leads to bias and inaccurate predictions (Wooldridge, 2010). Endogeneity is typically caused by selection effects, measurement error, common method variance, simultaneity, and alternate causal explanations that become manifest as omitted variables (Anderson, 2018). We account for the selection effect by controlling for the period of time between conception and screening in the PSED data collection project, as a longer period of time prior to screening would indicate a longer exposure to the risk of termination (Hechavarría et al., 2016; Yang and Aldrich, 2012). The use of longitudinal panel datasets addresses the simultaneity problem by reference to measures of the independent variables: action crisis time, implementation and planning all precede the termination outcome temporally. Finally, the possibility of endogeneity resulting from omitted variables is ruled out by including a number of control variables that are likely to affect both the independent and dependent variables, such as making sales, receiving external funding, or starting a high-tech venture.

In addition, we conducted two robustness tests. First, we conducted all analyses reported in Section 4.1 with an alternative operationalization of action crises. Instead of a minimum of two months, we measured an action crisis in terms of a phase in which no action was taken over a minimum period of one month. This approach led to an increase in the number of observations as well as to changes in the values of the following variables: action phase, action crisis time, persistence, implementation and planning. Tables S3 and S4 in Appendix 4 show all results from the multinomial logistic and the ZINB regression. All hypotheses with the exception of Hypothesis

3b are supported. Unlike the main results, these analyses do not indicate a significant effect of implementation on the number of months spent in an action crisis.

Second, as suggested by Wooldridge (2010), we conducted an augmented regression test (the Durbin–Wu–Hausman test) to investigate the endogeneity of the action crisis time variable in the model with respect to predicting the outcome in terms of termination versus persistence. To accomplish this task, we included the residuals of action crisis time as a function of the exogenous variables of planning and implementation in the multinomial logistic regression model. After including the residual, the main effect of action crisis time remained significant, whereas the effect of the residual did not. The result of the Hausman test ($\chi^2= 2.47, p = 0.12$) confirmed the *exogeneity* of the action crisis time variable.

5 Discussion

The purpose of this study is to enhance our knowledge of the termination subprocess of nascent entrepreneurship by integrating the decision between persistence and termination into the context of new venture creation by way of an extension of TAP with the notion of action crisis. Our empirical evidence suggests that (i) a more extensive action crisis leads to increased odds of terminating versus persisting in the context of new venture creation; (ii) prior planning and implementation actions inform action crises in different ways; (iii) an increase in the number of planning actions increases the likelihood of experiencing action crises but decreases the duration of action crises; and (iv) an increase in the number of implementation actions decreases the likelihood of experiencing action crises but increases the duration of action crises. By presenting these empirical findings, we make important contributions to the field of nascent entrepreneurship in terms of both research and practice. With respect to research, we extend TAP by reference to the notion of action crisis, which allows us to conceptualize termination as a subprocess of nascent entrepreneurship and to explain decisions between termination and persistence in the context of new venture creation. By taking the time-saving and time-delaying effects of actions into consideration, our study also offers a more nuanced view of entrepreneurial action. In practical terms, we address some lasting problems that arise in the context of entrepreneurship-focused public policies and provide practical advice for nascent entrepreneurs.

5.1 Theoretical implications

Our study makes several important contributions to the nascent entrepreneurship literature (Brush et al., 2008; Greene and Hopp, 2017; Hechavarría et al., 2016) and more particularly to the current action-based conceptualization of new venture creation (Gielnik et al., 2015). Most notably, our study extends TAP by reference to the notion of action crisis, which is a novel theoretical and practical phenomenon in (nascent) entrepreneurship literature. With this contribution, our understanding of the events that occur during nascent entrepreneurship, especially during the termination subprocess, is expanded to better reflect the lived experiences of nascent entrepreneurs. Indeed, by proposing the inclusion of the notion of action crisis as a transitional phase of the termination subprocess, we are better able to account for the decision between termination and persistence that many founders must make (Davidsson and Gruenhagen, 2021). The difficult decision between resuming one's efforts to achieve persistence and terminating one's new venture creation efforts entirely is resolved during a phase of action crisis. Whether nascent entrepreneurs decide to persist or terminate following a particular phase of action crisis is a function of the time spent within the action crisis. Central to our reasoning is therefore Klinger's (1987) notion that persistence and termination are not discrete and mutually exclusive states that follow an all-or-nothing pattern but rather two endpoints along a continuum of increasing experience of action crisis over time.

Our theoretical contribution with respect to extending TAP is also in line with other closely related concepts and theories. While the current entrepreneurship literature considers persistence to be a way of sustaining venture creation efforts (Hoang and Gimeno, 2010; Shook, 2003; Tietz et al., 2021), our study addresses an unaccounted aspect of persistence, namely the restarting and renewal of venture creation efforts following an action crisis (Davidsson and Gordon, 2016). Distinguishing between different aspects of persistence is important to understand when persistence is associated with positive or negative consequences (Holland and Shepherd, 2013). For example, resilience and escalation of commitment both involve persistence; nevertheless, resilience is viewed as a strength, while escalation of commitment is understood as a form of bias that leads to "throwing good money after bad" (Guler, 2007). Our conceptualization of persistence as bouncing back from an action crisis is more closely related to persistence in terms of resilience (Allen et al., 2020; Youssef and Luthans, 2007) as well as to the lean startup options of pivot and perseverance (Ries, 2011; Shepherd and Gruber, 2021).

Furthermore, our finding that nascent entrepreneurs are more likely to terminate rather than persist in new venture creation after a longer period of action crisis also contributes to the real options logic of "fail fast, fail cheaply" (McGrath, 1999). According to our results, failing fast(er) could be facilitated by shortening the

phase of action crisis, and we make a first step toward understanding the factors that influence the temporal extension of action crises. In this way, our findings support the lean startup proposition that the decision to terminate is informed by the length of the startup's runway, which refers to "the amount of time remaining in which a startup must either achieve lift-off or fail" (Ries, 2011). As time plays a central role in real options theory, we believe that the findings of our study can provide important insights into the levers that are available to entrepreneurs to limit sunk costs (Reilly et al., 2016). The amount of time it takes nascent entrepreneurs to decide to terminate their new venture creation efforts may have further implications for both founders and potential shareholders, such as lenders, employees, customers, and suppliers (Arora and Nandkumar, 2011; Balcaen et al., 2011). Therefore, shortening the action crisis phase can not only improve the likelihood of persistence but also result in lower sunk costs in the case of termination (Reynolds, 2016b). A longer phase of action crisis, on the other hand, can consume scarce personal resources that could be directed to the pursuit of other endeavors (DeTienne, 2010; Wrosch et al., 2003), such as starting other entrepreneurial projects (Hayward et al., 2010; Hessels et al., 2011; Hsu et al., 2017; Ucbasaran et al., 2013). Our findings suggest that the length of the action crisis is informed by the actions of planning and implementation that have previously been taken, but further research is necessary to investigate the antecedents of action crisis and the factors that influence the duration of this phase.

Finally, our study has implications for entrepreneurial action theory (Chandler et al., 2011; Giménez Roche and Calcei, 2021; Mansoori and Lackéus, 2020). In the broader context of the entrepreneurial action framework, some recent theoretical paradigms, such as effectuation (Sarasvathy, 2001), bricolage (Baker and Nelson, 2005), and opportunity creation (Alvarez and Barney, 2007), have raised doubts regarding the need to take planning actions and instead advocated for experimentation and a "make do" approach (e.g. Perry et al., 2012). Our results indicating that planning increases the odds of action crisis but shortens the duration of action crisis address the important discussion regarding whether nascent entrepreneurs should or should not engage in planning (Burke et al., 2010; Greene and Hopp, 2017). Previous research has suggested that writing a business plan is a costly use of time (Burke et al., 2010). We disentangle this argument by explaining the source of the potential time-delaying effects of planning—namely, in the higher likelihood of experiencing action crisis as nascent entrepreneurs wait for the planned opportunities for which they have planned to arise – and we simultaneously highlight the potential time-saving effects of planning resulting from a decrease in the time spent in an action crisis. Furthermore, we find that an increase in the number of implementation actions leads to decreased odds of experiencing an action crisis as well as prolonged time spent in an action crisis. Hence,

implementation also has potential time-saving effects, as nascent entrepreneurs experiencing the momentum or flow associated with taking action are less likely to be interrupted by action crises, while simultaneously, implementation has a potential time-delaying effect because goal attainment bias and action orientation lead to delayed decision-making during action crises (Arkes and Blumer, 1985; McMullen and Kier, 2016). However, the significance of the effect of implementation on the number of months spent in action crisis decreases with a decrease of the minimum amount of time spent in action crisis from two months to one month. This finding could indicate a potential boundary condition for the effect of implementation on the number of months spent in action crisis. The goal attainment bias and action orientation of implementation actions that lead to prolonged action crisis might not activate immediately, producing a delayed effect that becomes significant after the second month of action crisis. Similar delayed effects of implementation actions like resource mobilization for example provide a realistic representation of the process of creating a new venture (Lomi et al., 2010). Hence, the effect of implementation on the time spent in action crisis should be interpreted with caution, and future empirical research can explore potential boundary conditions for this effect. Overall, our results increase our understanding of the temporal dynamics associated with the actions taken during new venture creation (Lévesque and Stephan, 2019; McMullen and Dimov, 2013) and clear a path for new avenues of research to investigate the time-saving and time-delaying effects of actions.

5.2 Practical implications

The findings of this study enable nascent entrepreneurs to navigate the complex landscape of new venture creation and the related behaviors and decisions more effectively. In cases of doubt, nascent entrepreneurs should engage in planning and should attempt to preserve their implementation momentum by undertaking as many actions as possible without pausing for long intervals. Being aware that long action crisis phases are more likely to result in termination could also motivate nascent entrepreneurs to pay closer attention to these phases and encourage them to seek opportunities for action renewal more quickly. The length of time that nascent entrepreneurs spend in phases of action crisis can have important implications for the ultimate outcomes of their endeavors and possible further implications for their well-being (Carver and Scheier, 2005), mental and physical health (Miller and Wrosch, 2007), and future entrepreneurial pursuits (Hayward et al., 2010; Hessels et al., 2011; Hsu et al., 2017; Ucbasaran et al., 2013). Although more research on the consequences of action crisis is necessary to explore these implications, we believe that nascent entrepreneurs should monitor their progress and increase their awareness both of the actions they take and of the time they spend in action crises.

During a time when entrepreneurship is receiving increasing support from public policy, business incubators, entrepreneurial centers, and private financiers (Thompson et al., 2012), the emphasis is on the task of ensuring that new venture creation efforts remain alive. However, support providers should question whether they are helping nascent entrepreneurs push through inevitable difficulties or creating the ‘living dead’ by prolonging entrepreneurs’ periods of action crisis. Thus, we propose that more attention should be given to the task of encouraging persistence, operationalized in terms of action renewal and restart after periods of action crisis. Furthermore, we encourage policy-makers and supporting organizations to pay closer attention to the temporal aspect of the new venture creation as well as to monitor both the phases of action and action crisis. The latter might convey important information regarding the outcome of termination; thus, investors and support providers should question and investigate long periods of action crisis more closely.

5.3 Limitations and conclusions

We acknowledge some limitations of our study that future researchers should address. First, we consider action crisis in terms of disengagement from action without being able to observe the affective, cognitive, and physiological correlates of action crisis directly (Ghassemi et al., 2017). Despite the fact that our theoretical argumentation builds on previous action crisis research and suggests that the deliberative mindset and reduced well-being associated with action crisis intensify over time, further research is necessary to explore the actual affective, cognitive, and physiological experiences of action crisis and their role in making decisions between termination and persistence. More research is necessary to expand our understanding of the events that occur during an action crisis to include the full range of experiences and interactions. In addition, it would also be interesting to explore the process patterns and sequences of events surrounding an action crisis to address topics such as *when an action crisis is more or less likely to occur* or *whether the outcome of an action crisis depends on when in the new venture creation process entrepreneurs experience action crisis*. These factors could also have interesting cumulative effects, such that every time an action crisis occurs, the entrepreneur finds it increasingly difficult to persist. Overall, we believe that the topic of action crisis deserves further investigation.

Second, our observations of planning and implementation are limited in two ways. First, we are only able to observe whether planning or implementation actions have been completed and are thus unable to track the amount of time and resources invested in action realization. In addition, the completion of each particular action could lead to more or less favorable outcomes (Kuechle et al., 2016). For example, once financial projections have been created, the resulting outcome could be (i) positive, (ii) negative or (iii) ambiguous. Unfortunately, the PSED

datasets do not contain information regarding the results of undertaking specific actions. Such information would be important to explore the question of when performing planning and implementation actions is more or less beneficial with respect to reducing the length of the action crisis phase in further detail. Taking these two limitations into account, future research should investigate additional properties of planning and implementation, such as the number of hours or resources invested in completing each action and the results obtained by completing each action. This investigation can be carried out by conducting in-depth periodic and regular interviews with nascent entrepreneurs.

Third, we report significant country effects on the odds of experiencing an action crisis as well as on the time spent in an action crisis in the ZINB. However, the harmonized PSED includes data from four countries that was collected by different research institutions over different periods, starting in the 1990s and continuing until the early 2000s. Hence, the country effects that we find could be the result of cross-country differences, differences among various periods of data collection, or even differences in the associated sample sizes. Because the current literature on action crisis remains in its infancy and, hence, country effects have not yet been determined, in our study, we lack sufficient theoretical justification for exploring cross-country differences in the effects of action crisis on outcomes related to termination and persistence. We encourage future scholarly work to focus on potential country, time, and sample size differences when using the harmonized PSED to improve the methodology of our study and its main findings.

Notwithstanding these limitations, we believe that our study can contribute meaningfully to the production of a more complete and realistic understanding of the termination subprocess of nascent entrepreneurship. Given that termination occurs frequently in the context of new venture creation but is not well understood, our study is both timely and important. Moreover, we echo the appeal of Shepherd and Gruber (2021) to entrepreneurship researchers to avoid perpetuating the antifailure bias in future founders. Finally, our use of the harmonized PSED dataset represents a more comprehensive and representative approach than has been the norm in previous studies conducted in this area. As a result, we believe that our empirical results, which support our hypotheses, have important implications for academics, practitioners, and policy-makers. At the very least, we hope to have enriched the emerging literature regarding the importance of action crisis in the context of nascent entrepreneurship.

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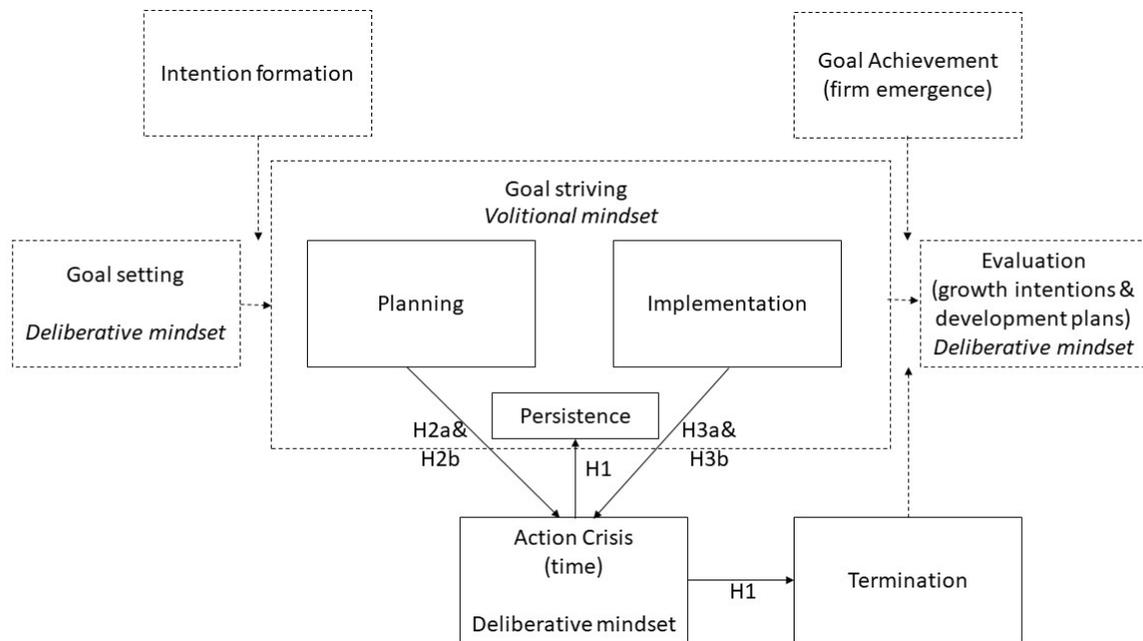
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Figures and tables

Figure 1. Conceptual model based on Achtzinger & Gollwitzer (2018)



*Dashed lines map the conceptual model of the theory of action phases and highlight the explicit inclusion of action crisis as well as the novel conceptualization of persistence in terms of restarting and renewing goal striving (i.e., actions aimed at venture creation) following an action crisis.

** Solid lines outline the constructs and hypotheses subject to empirical investigation in this study.

Table 1. Descriptive Statistics, Means, Standard Deviations, and Correlations

Variable	Mean	Std. Dev.	1.	2.	3.	4.	5.	6.	7.	8.	9.	10.	11.	12.	13.	14.
1. Team size	1.77	0.10	1.00													
2. Australia	0.17	0.38	0.03***	1.00												
3. Sweden	0.14	0.35	0.03***	-0.19***	1.00											
4. China	0.09	0.29	0.04***	-0.14***	-0.13***	1.00										
5. United States	0.59	0.49	-0.07***	-0.56***	-0.49***	-0.38***	1.00									
6. Extract indust	0.13	0.33	0.03***	0.05***	-0.00	0.03***	-0.06***	1.00								
7. Bus serv indust	0.12	0.32	0.07***	-0.02**	0.03***	-0.06***	0.03***	-0.13***	1.00							
8. Transform indust	0.33	0.47	0.00	-0.09***	-0.10***	0.02**	0.12***	-0.26***	0.10***	1.00						
9. Consum indust	0.45	0.50	-0.04***	-0.06***	0.11***	-0.03**	-0.02*	-0.33***	-0.32***	-0.61***	1.00					
10. Screen time	22.30	21.96	0.02	-0.02**	-0.03***	-0.07***	0.08***	0.07***	0.01	-0.03***	-0.03***	1.00				
11. Age 18 to 24	0.08	0.27	0.03***	-0.07***	-0.09***	0.19***	0.01	-0.06***	0.05***	0.02**	0.03***	-0.08***	1.00			
12. Age 25 to 34	0.25	0.43	0.03***	-0.06***	0.13***	0.15***	-0.13***	-0.05***	0.05***	0.02**	-0.00	-0.05***	-0.17***	1.00		
13. Age 35 to 44	0.28	0.45	-0.03***	0.05***	0.09***	-0.10***	-0.05***	0.00	-0.04***	0.00	-0.00	0.03***	-0.18***	-0.36***	1.00	
14. Age 45 to 54	0.24	0.43	-0.04***	0.01	-0.09***	-0.11***	0.11***	0.01	-0.07***	-0.01	0.02*	0.01	-0.17***	-0.32***	-0.35***	1.00
15. Age 55+	0.15	0.36	0.02**	0.05***	-0.10***	-0.08***	0.07***	0.08***	0.03***	-0.04***	-0.04***	0.07***	-0.13***	-0.25***	-0.26***	-0.24***
16. Education	0.18	0.38	0.06***	0.00	0.06***	-0.10***	0.02*	-0.01	0.01	-0.08***	0.08***	0.04***	-0.12***	-0.09***	0.02*	0.04***
17. Gender	0.61	0.49	0.11***	-0.04***	0.07***	0.09***	-0.07***	0.04***	0.11***	0.01	-0.07***	0.03**	0.07***	0.04***	-0.05***	-0.06***
18. High tech	0.32	0.47	0.08***	0.03***	-0.01	0.10***	-0.07***	-0.01	0.15***	-0.03***	0.02**	0.07***	0.06***	-0.00	-0.00	-0.03***
19. RD focus	0.35	0.48	0.09***	0.14***	0.03**	0.11***	-0.17***	0.03***	0.02*	-0.02*	0.01	0.08***	0.04***	0.04***	-0.01	0.02*
20. Sales	0.40	0.49	-0.06***	0.02**	-0.12***	-0.18***	0.17***	-0.00	0.02*	0.02**	-0.02*	0.05***	-0.03***	-0.05***	0.01	0.02**
21. External funding	0.08	0.27	0.05***	0.04***	-0.07***	-0.04***	0.05***	0.04***	0.04***	0.01	-0.05***	-0.01	-0.01	-0.01	-0.02*	0.01
22. Action phase	0.51	0.50	-0.00	0.00	-0.00	0.01	-0.01	-0.00	-0.00	0.00	0.00	-0.02	0.00	0.00	0.00	-0.00
23. Implementation	2.03	1.96	0.04***	-0.01	-0.04***	0.02**	0.02*	-0.00	-0.02*	0.02**	-0.00	-0.17***	0.00	-0.01	0.03***	-0.01
24. Planning	0.71	0.88	0.02*	0.01	0.05***	0.08***	-0.10***	-0.02*	-0.01	-0.00	0.02	-0.17***	0.01	0.02	0.01	-0.01
25. Action crisis time	5.53	11.68	-0.02**	0.01	-0.01	-0.07***	0.04***	0.02	-0.00	-0.01	-0.01	0.13***	-0.04***	-0.03***	0.01	0.01
26. Persistence	0.54	0.50	-0.01	0.01	-0.01	-0.03***	0.02	0.00	-0.00	-0.01	0.00	0.00	-0.01	0.00	-0.00	0.00
27. Termination	.06	0.24	-0.01	-0.02*	-0.00	0.01	0.01	-0.01	-0.00	0.03***	-0.02*	-0.09***	0.02**	-0.00	-0.01	0.01
28. Emergence	.05	0.22	0.01	0.01	0.03***	0.05***	-0.06***	-0.01	-0.00	0.00	0.01	-0.06***	0.00	0.01	0.02*	-0.01

* $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$

Table 1. Continued

Variable	15.	16.	17.	18.	19.	20.	21.	22.	23.	24.	25.	26.	27.	28.
1. Team size														
2. Australia														
3. Sweden														
4. China														
5. United States														
6. Extract indust														
7. Bus serv indust														
8. Transform indust														
9. Consum indust														
10. Screen time														
11. Age 18 to 24														
12. Age 25 to 34														
13. Age 35 to 44														
14. Age 45 to 54														
15. Age 55+	1.00													
16. Education	0.12***	1.00												
17. Gender	0.03***	0.03**	1.00											
18. High tech	-0.00	0.06***	0.13***	1.00										
19. RD focus	-0.08***	0.05***	0.04***	0.27***	1.00									
20. Sales	0.04***	-0.00	-0.07***	-0.06***	-0.10***	1.00								
21. External funding	0.04***	0.01	-0.01	-0.04***	-0.06***	0.18***	1.00							
22. Action phase	-0.00	-0.00	0.00	-0.00	-0.00	-0.07***	-0.04***	1.00						
23. Implementation	-0.02	-0.01	-0.00	-0.01	-0.03***	0.13***	0.11***	0.02**	1.00					
24. Planning	-0.03***	0.00	0.00	0.00	-0.01	-0.09***	-0.02**	0.01	0.34***	1.00				
25. Action crisis time	0.03***	0.02*	-0.01	-0.00	-0.01	0.17***	0.10***	-0.49***	-0.00	--0.05**	1.00			
26. Persistence	0.01	0.01	-0.01	0.01	0.01	-0.02	0.00	0.850***	-0.02*	-0.03***	-0.21***	1.00		
27. Termination	-0.01	-0.03***	-0.01	-0.03***	-0.03**	0.04***	0.04***	-0.19***	0.03***	0.01	0.14***	-0.28***	1.00	
28. Emergence	-0.02*	0.01	0.02*	0.00	-0.02*	0.14**	0.08***	-0.08**	0.10***	0.02**	0.02***	-0.25***	-0.06***	1.00

* $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$

Table 2. Results from logistic regression for termination versus emergence

Logit. Dependent Variable: Termination versus Emergence.

	Model 1		Model 2	
	<i>Coeff</i>	<i>SE</i>	<i>Coeff</i>	<i>SE</i>
Action phase			-1.55***	(0.16)
Implementation	-0.08***	(0.03)	-0.06**	(0.03)
Planning	0.01	(0.07)	0.03	(0.07)
Team size	-0.09	(0.06)	-0.12*	(0.06)
Australia	-0.65***	(0.15)	-0.64***	(0.16)
Sweden	-0.90***	(0.17)	-0.87***	(0.17)
China	-1.22***	(0.27)	-1.16***	(0.28)
Extractive industry	0.07	(0.27)	0.11	(0.28)
Business service industry	-0.10	(0.22)	-0.05	(0.22)
Transforming industry	0.00	(0.21)	0.08	(0.22)
Consumer industry	-0.31	(0.22)	-0.20	(0.23)
Screen time	-0.00	(0.00)	-0.00	(0.00)
Age 18 to 24	0.11	(0.26)	0.12	(0.28)
Age 25 to 34	-0.22	(0.20)	-0.16	(0.21)
Age 35 to 44	-0.35*	(0.19)	-0.29	(0.19)
Age 45 to 54	-0.11	(0.19)	-0.15	(0.20)
Education	-0.37**	(0.15)	-0.33**	(0.16)
Gender	-0.18	(0.12)	-0.11	(0.12)
High tech	-0.25*	(0.14)	-0.29**	(0.14)
RD focus	0.17	(0.13)	0.05	(0.14)
Sales	-1.10***	(0.13)	-1.39***	(0.14)
External funding	-0.24	(0.16)	-0.32**	(0.16)
Constant	2.19***	(0.31)	2.62***	(0.32)
<i>N</i>	1479		1479	

Standard errors in parentheses. Robust standard errors clustered at the individual level.

* $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$

Note: Action phase is a binary variable that is coded as 1 for the action phase and 0 for the action crisis phase

Note: The omitted base categories are United States for the country and Age 55+ for age

Table 3. Results from the multinomial logistic regression for termination versus persistence

Dependent Variable: Termination versus Persistence.

	Model 1		Model 2	
	<i>Coeff</i>	<i>SE</i>	<i>Coeff</i>	<i>SE</i>
Action crisis time			0.02***	(0.00)
Implementation	0.01	(0.02)	0.02	(0.02)
Planning	-0.08*	(0.05)	-0.08	(0.05)
Team size	-0.06	(0.04)	-0.06	(0.04)
Australia	-0.14	(0.10)	-0.16	(0.11)
Sweden	0.34***	(0.10)	0.33***	(0.10)
China	0.02	(0.20)	0.08	(0.20)
Extractive industry	-0.13	(0.16)	-0.15	(0.16)
Business service industry	-0.14	(0.13)	-0.14	(0.13)
Transforming industry	0.06	(0.13)	0.07	(0.13)
Consumer industry	-0.21	(0.13)	-0.21	(0.13)
Screen time	-0.03***	(0.00)	-0.03***	(0.00)
Age 18 to 24	0.15	(0.14)	0.23	(0.15)
Age 25 to 34	-0.01	(0.12)	0.02	(0.12)
Age 35 to 44	-0.01	(0.12)	0.01	(0.12)
Age 45 to 54	0.13	(0.11)	0.15	(0.12)
Education	-0.25**	(0.10)	-0.28***	(0.10)
Gender	-0.02	(0.07)	-0.02	(0.07)
High tech	-0.06	(0.08)	-0.07	(0.08)
RD focus	-0.09	(0.08)	-0.09	(0.08)
Sales	0.50***	(0.07)	0.37***	(0.08)
External funding	0.60***	(0.12)	0.48***	(0.13)
Constant	-1.23***	(0.02)	-1.32***	(0.19)
<i>N</i>	13817.00		13817.00	

Standard errors in parentheses. Robust standard errors clustered at the individual level.

* $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$

Note: The omitted base categories are United States for the country and Age 55+ for age

Table 4. Results of the zero inflated negative binomial regression

ZINB. Dependent Variable: Action Crisis Time.

	Model 1				Model 2				Model 3			
	Negative binomial: Number of months		Logit: Probability of action		Negative binomial: Number of months		Logit: Probability of action		Negative binomial: Number of months		Logit: Probability of action	
	<i>Coeff</i>	<i>SE</i>	<i>Coeff</i>	<i>SE</i>	<i>Coeff</i>	<i>SE</i>	<i>Coeff</i>	<i>SE</i>	<i>Coeff</i>	<i>SE</i>	<i>Coeff</i>	<i>SE</i>
Implementation	0.03***	(0.01)	0.03***	(0.00)					0.02*	(0.01)	0.04***	(0.00)
Planning	-0.17***	(0.02)	-0.05***	(0.01)					-0.07***	(0.02)	-0.04***	(0.01)
Team size					-0.03*	(0.02)	-0.02***	(0.01)	-0.03*	(0.02)	-0.02***	(0.01)
Australia					0.04	(0.05)	0.02	(0.01)	0.04	(0.05)	0.03*	(0.01)
Sweden					-0.09*	(0.05)	-0.05***	(0.02)	-0.08	(0.05)	-0.04**	(0.02)
China					-0.30***	(0.07)	-0.12***	(0.03)	-0.29***	(0.07)	-0.12***	(0.03)
Extractive industry					-0.03	(0.08)	0.02	(0.02)	-0.03	(0.08)	0.01	(0.02)
Business service industry					-0.06	(0.06)	0.02	(0.02)	-0.07	(0.06)	0.03	(0.02)
Transforming industry					-0.06	(0.07)	0.01	(0.02)	-0.06	(0.07)	0.01	(0.02)
Consumer industry					-0.04	(0.07)	0.02	(0.02)	-0.04	(0.07)	0.01	(0.02)
Screen time					0.01***	(0.00)	0.00***	(0.00)	0.01***	(0.00)	0.00***	(0.00)
Age 18 to 24					-0.19***	(0.06)	-0.05**	(0.02)	-0.19***	(0.06)	-0.05**	(0.02)
Age 25 to 34					-0.08	(0.05)	-0.01	(0.02)	-0.07	(0.05)	-0.01	(0.02)
Age 35 to 44					-0.07	(0.05)	0.00	(0.02)	-0.07	(0.05)	-0.00	(0.02)
Age 45 to 54					-0.04	(0.05)	-0.01	(0.01)	-0.04	(0.05)	-0.01	(0.01)
Education					0.00	(0.04)	0.01	(0.01)	0.01	(0.04)	0.01	(0.01)
Gender					0.03	(0.03)	0.01	(0.01)	0.03	(0.03)	0.01	(0.01)
High tech					-0.00	(0.04)	-0.02	(0.01)	0.00	(0.04)	-0.02	(0.01)
RD focus					-0.00	(0.03)	-0.05***	(0.01)	-0.00	(0.03)	-0.05***	(0.01)
Sales					0.53***	(0.03)	-0.22***	(0.02)	0.51***	(0.03)	-0.24***	(0.02)
External funding					0.35***	(0.06)	-0.14***	(0.03)	0.34***	(0.06)	-0.16***	(0.03)
Alpha			0.32***	(0.03)			0.09***	(0.03)			-0.12***	(0.03)
Constant	2.32***	(0.02)	-0.31***	(0.02)	1.92***	(0.09)	-0.09***	(0.03)	1.94***	(0.09)	0.09***	(0.03)
<i>N</i>		15408.00				13817.00				13817.00		

Standard errors in parentheses. Robust standard errors clustered at individual level. * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$

Appendices

Appendix 1

The harmonized PSED dataset contains a variable *CASEKEEP*, which offers researchers an indication of cases that should be retained for statistical analysis. In accordance with the *CASEKEEP* variable, first, we removed 413 participants because they were unavailable for follow-up interviews, and we were thus unable to observe key outcome variables such as termination and emergence. We removed an additional 579 participants because they reported undertaking fewer than three actions during the period of observation. We assumed that such ‘dilettante dreamers’ (Davidsson & Gordon, 2012; Parker & Belghitar, 2006), ‘hobbyists’ (Reynolds & Curtin, 2008) or ‘dabblers’ (Carter et al., 1996) did not devote time and effort to the task of establishing their venture and that they were ‘never really very likely to amount to anything’ (Parker & Belghitar, 2006, p. 96); including such an inactive group of participants may have led to misleading results and model misspecification. We further removed 51 participants because they had more than 12-month gaps between any two actions they had undertaken, once again indicating low levels of commitment. We removed five more participants because their reported dates of termination were earlier than their ventures’ conception dates. (We measured conception date in terms of the date of the first action of two actions undertaken by the entrepreneur over a 12-month period [Reynolds & Curtin, 2011]). We removed an additional 38 participants because they reported terminating their venture creation attempts before being screened into the PSED study (in any of the cohorts), thus suggesting that their responses were entirely retrospective. Finally, we removed 33 more participants because the conception date of their venture was more than 10 years prior to the initial data collection point. In these cases, we questioned the accuracy of the information provided by the participants (LeBrasseur et al., 2003; Yang & Aldrich, 2012).

Appendix 2

Table S1. Distribution of the number of action phases and action crisis phases across participants

Number of action phases	Number of action crisis phases											Total
	0	1	2	3	4	5	6	7	8	9	10	
1	106	264	3	0	0	0	0	0	0	0	0	373
2	0	107	547	5	0	0	0	0	0	0	0	659
3	0	0	96	523	10	0	0	0	0	0	0	629
4	0	0	0	54	345	7	0	0	0	0	0	406
5	0	0	0	0	35	220	0	0	0	0	0	255
6	0	0	0	0	0	11	110	1	0	0	0	122
7	0	0	0	0	0	0	7	49	2	0	0	58
8	0	0	0	0	0	0	0	1	22	0	0	23
9	0	0	0	0	0	0	0	0	1	9	0	10
10	0	0	0	0	0	0	0	0	0	0	1	1
Total	106	371	646	582	390	238	117	51	25	9	1	2536

Total *N* of participants = 2,536

Total *N* of phases = 15,408

Appendix 3

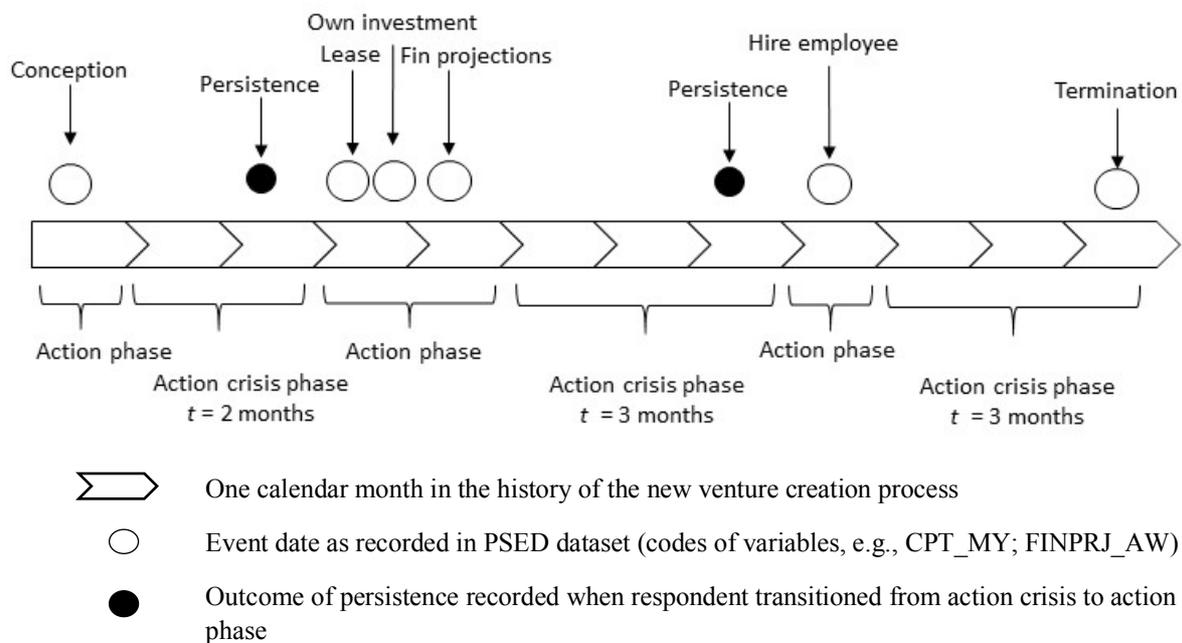
Table S2. Variable Measures

Variable	PSED Item code	Definition
1. Team size	<i>TM_SIZEH</i>	Total number of people on the team
2. Australia	PROJECT (Unique cohort code CAUSEE)	Country of data collection
3. Sweden	PROJECT (Unique cohort code SE PSED)	Country of data collection
4. China	PROJECT (Unique cohort code CH PSED)	Country of data collection
5. United States	PROJECT (Unique cohort codes; US PSED I & II)	Country of data collection
6. Extract indust	SECTOR_20C_US;	Manufacturing; agriculture; forestry; fishery
7. Bus serv indust	SECTOR_17C_AU;	Finance and insurance, real estate; information (computer/IT)
8. Transform indust	SECTOR_08C_SE;	Wholesale, retail; information (computer/IT); transportation; construction
9. Consum indust	SECTOR_15C_CH	Educational services, accommodation and food services, professional services; health and social services; administrative services; consumer services; arts and entertainment
10. Screen time	SC_DATE – CPT_MY	Months of lag from conception to screening interview in start-up characteristics
11. Age 18 to 24	<i>TMI_AGE</i>	Dummy variable for respondents between the ages of 18 and 24
12. Age 25 to 34		Dummy variable for respondents between the ages of 25 and 34
13. Age 35 to 44		Dummy variable for respondents between the ages of 35 and 44
14. Age 45 to 54		Dummy variable for respondents between the ages of 45 and 54
15. Age 55+		Dummy variable for respondents above the age of 55
16. Education	<i>TMI_EDUC</i>	Educational attainment in terms of university degree
17. Gender	<i>TMI_SEX</i>	Sex of respondent
18. High tech	<i>HI_TECHQ</i>	
19. R&D focus	<i>RD_FOCUS</i>	Dichotomous variable (1 = yes) indicating whether R&D was a major spending priority
20. Sales	<i>SALES_AW</i>	First income from sales received
21. External funding	<i>GETFNDAW</i>	Obtained initial funding
22. Action phase	Please refer to Figure S1	A period of consecutive months in which actions (planning and/or implementation) were performed (e.g., LEASE_AW). Binary variable: 1 = action phase, 0 = action crisis
23. Implementation	<i>LEASE_AW</i> <i>PURCHAAW</i> <i>PATENTAW</i> <i>PROMOTAW</i> <i>MODEL_AW</i> <i>SUTEAMAW</i> <i>PHLISTAW</i> <i>SUPCRDAW</i> <i>FTWK_AW1</i> <i>EIN__AW</i> <i>HIRE__AW</i> <i>ASKFNDAW</i> <i>ONINVAW1</i>	Sum of 13 indicators indicating whether the nascent entrepreneur had performed each of the implementation actions harmonized among the 5 data collection cohorts
24. Planning	<i>BUSPLNAW</i> <i>DFNMKTAW</i>	Sum of three indicators indicating whether the nascent entrepreneur (1) had begun to implement a business plan; (2) had

	<i>FINPRJAW</i>	made efforts to define market opportunities; and (3) had developed projected financial statements
25. Action crisis time	Please refer to Figure S1	A period of time measured in months in which no planning or implementation actions were taken.
26. Persistence	Please refer to Figure S1	Outcome status based on transition from action crisis to action phase
27. Termination	SU_QUIT	Outcome status based on respondent self-reports and the month and year they stopped working on the venture
28. Emergence	SU_NEWF	Outcome status based on respondent self-reports and the month and year revenue first exceeded expenses

The graph shown below demonstrates the ways in which we used the data collected and recorded in the PSED dataset to construct the variables of interest, namely, *action phase*, *action crisis time* and *persistence*. The graph shows the history of one respondent’s attempt at new venture creation that resulted in termination 12 months after conception. In our dataset, this respondent’s data are represented by six observations, including three observations of *action phases*, in which the actions of conception, own investment, leasing, financial projections, and hiring employees were performed, and three observations of *action crisis*, which ranged from two to three months in length. Finally, the graph indicates that two of the action crises resulted in the outcome of persistence, as the respondent moved from a period when no actions were taken to a month in which new actions were performed.

Figure S1. Constructing study variables from PSED event dates



Appendix 4

Table S3. Results of the multinomial logistic regression for termination versus persistence

Dependent Variable: Termination versus Persistence.

	Model 1		Model 2	
	<i>Coeff</i>	<i>SE</i>	<i>Coeff</i>	<i>SE</i>
Action crisis time			0.03***	(0.00)
Implementation	-0.05*	(0.02)	-0.05*	(0.03)
Planning	-0.13**	(0.05)	-0.11**	(0.05)
Team size	-0.05	(0.04)	-0.05	(0.04)
Australia	-0.20**	(0.10)	-0.22**	(0.11)
Sweden	0.38***	(0.10)	0.36***	(0.10)
China	0.01	(0.20)	0.08	(0.20)
Extractive industry	-0.16	(0.15)	-0.17	(0.16)
Business service industry	-0.16	(0.12)	-0.14	(0.13)
Transforming industry	0.03	(0.12)	0.05	(0.13)
Consumer industry	-0.24*	(0.13)	-0.24*	(0.13)
Screen time	-0.03***	(0.00)	-0.03***	(0.00)
Age 18 to 24	0.11	(0.15)	0.21	(0.15)
Age 25 to 34	-0.04	(0.12)	0.00	(0.12)
Age 35 to 44	-0.08	(0.11)	-0.05	(0.12)
Age 45 to 54	0.08	(0.11)	0.11	(0.12)
Education	-0.30***	(0.10)	-0.34***	(0.10)
Gender	-0.03	(0.07)	-0.03	(0.07)
High tech	-0.06	(0.08)	-0.08	(0.08)
RD focus	-0.06	(0.08)	-0.06	(0.08)
Sales	0.61***	(0.07)	0.44***	(0.08)
External funding	0.60***	(0.12)	0.44***	(0.13)
Constant	-1.38***	(0.18)	-1.50***	(0.19)
<i>N</i>	16838.00		16838.00	

Standard errors in parentheses. Robust standard errors clustered at the individual level.

* $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$

Note: The omitted base categories are United States for the country and Age 55+ for age

Table S4. Results of the zero inflated negative binomial regression

ZINB. Dependent Variable: Action Crisis Time.

	Model 1				Model 2				Model 3			
	Negative binomial: Number of months		Logit: Probability of action		Negative binomial: Number of months		Logit: Probability of action		Negative binomial: Number of months		Logit: Probability of action	
	<i>Coeff</i>	<i>SE</i>	<i>Coeff</i>	<i>SE</i>	<i>Coeff</i>	<i>SE</i>	<i>Coeff</i>	<i>SE</i>	<i>Coeff</i>	<i>SE</i>	<i>Coeff</i>	<i>SE</i>
Implementation	0.02*	(0.01)	0.14***	(0.03)					0.01	(0.01)	0.05***	(0.01)
Planning	-0.21***	(0.03)	-1.09***	(0.25)					-0.10***	(0.03)	-0.18***	(0.03)
Team size					-0.03	(0.02)	-0.04**	(0.02)	-0.03	(0.02)	-0.04**	(0.02)
Australia					0.02	(0.06)	0.01	(0.05)	0.02	(0.06)	0.02	(0.05)
Sweden					-0.08	(0.06)	-0.20***	(0.08)	-0.06	(0.06)	-0.16**	(0.07)
China					-0.36***	(0.08)	-0.76***	(0.22)	-0.33***	(0.08)	-0.64***	(0.18)
Extractive industry					-0.09	(0.09)	-0.04	(0.08)	-0.09	(0.09)	-0.04	(0.08)
Business service industry					-0.10	(0.07)	-0.04	(0.07)	-0.11	(0.07)	-0.03	(0.07)
Transforming industry					-0.13*	(0.08)	-0.10	(0.07)	-0.13*	(0.07)	-0.11	(0.07)
Consumer industry					-0.11	(0.08)	-0.10	(0.08)	-0.12	(0.08)	-0.09	(0.07)
Screen time					0.01***	(0.00)	0.01***	(0.00)	0.01***	(0.00)	0.01***	(0.00)
Age 18 to 24					-0.19**	(0.08)	-0.17**	(0.08)	-0.20***	(0.08)	-0.17**	(0.08)
Age 25 to 34					-0.09	(0.06)	-0.07	(0.05)	-0.09	(0.06)	-0.07	(0.05)
Age 35 to 44					-0.12**	(0.06)	-0.09*	(0.05)	-0.11**	(0.06)	-0.08*	(0.05)
Age 45 to 54					-0.07	(0.05)	-0.05	(0.05)	-0.07	(0.05)	-0.05	(0.05)
Education					-0.04	(0.05)	-0.04	(0.04)	-0.04	(0.05)	-0.04	(0.04)
Gender					0.02	(0.04)	-0.00	(0.03)	0.02	(0.04)	-0.00	(0.03)
High tech					0.00	(0.04)	-0.02	(0.04)	0.00	(0.04)	-0.02	(0.04)
RD focus					0.03	(0.04)	-0.05	(0.04)	0.03	(0.04)	-0.05	(0.04)
Sales					0.70***	(0.04)	-0.01	(0.04)	0.69***	(0.04)	-0.05	(0.04)
External funding					0.42***	(0.07)	-0.06	(0.06)	0.42***	(0.07)	-0.09	(0.06)
Alpha			1.43***	(0.03)			1.04***	(0.05)			1.03***	(0.05)
Constant	1.66***	(0.03)	-2.80***	(0.27)	1.33***	(0.10)	-1.32***	(0.15)	1.40***	(0.11)	-1.25***	(0.14)
<i>N</i>		18790.00				16838.00				16838.00		

Standard errors in parentheses. Robust standard errors clustered at individual level. * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$