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Citation

A Dynamic Account of Self-Efficacy in Entrepreneurship

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Abstract

We present a dynamic account of self-efficacy in entrepreneurship that integrates social cognitive and control theory. According to our dynamic account, variability in self-efficacy energizes action because it involves self-motivation and discrepancy perception as competing motivational processes. We argue that variability and the average level in self-efficacy nascent entrepreneurs display over time support the enactment of entrepreneurial intentions and predict business ownership. The proposed positive effect of variability further implies an inverted u-shaped relationship between self-efficacy at a single point in time and business ownership. To test these hypotheses, we repeatedly assessed entrepreneurial self-efficacy of nascent African entrepreneurs during a 12-week entrepreneurship training program (total N = 241). Twelve months later, we assessed business ownership (total N = 190). We found that variability and the average level in entrepreneurial self-efficacy participants displayed during the training program were positively related to business ownership. Furthermore, for participants with strong entrepreneurial intentions, we found an inverted u-shaped relationship between entrepreneurial self-efficacy after the training program and business ownership. The study suggests that social cognitive and control theory highlight different facets of self-regulation that both need to be accounted for to explain goal achievement in entrepreneurship.

Keywords: Entrepreneurship, Motivation, Self-Regulation, Venture Creation, Whole Trait Theory

Many people intend to start a new business, but only few accomplish this task. Often the goal of starting a business is not sufficiently strong to compete with other goals or a person is not able to mobilize the willpower to act on his or her intention (van Gelderen, Kautonen, & Fink, 2015). In fact, only 12% to 23% of nascent entrepreneurs—people with the intention to create a new business—eventually succeed in business creation (Reynolds & Curtin, 2008). A major challenge in the field of entrepreneurship is thus to explain why some nascent entrepreneurs are more successful than others in overcoming the gap between intention and action (Frese, 2009; McMullen & Shepherd, 2006).

Success at moving from intention to action and ultimately creating a business depends on the support of self-regulatory processes, among which self-efficacy plays a particularly prominent role (Bandura, 1991; Lord, Diefendorff, Schmidt, & Hall, 2010). According to social cognitive theory, the interplay between self-efficacy and a person's goals results in high performance (Bandura, 2012; Bandura & Locke, 2003). Specifically, the theory holds that self-efficacy leads to higher goals and self-efficacy also strengthens the link between goals and goal achievement. Self-efficacy increases the likelihood of goal achievement because people with high self-efficacy are more motivated and respond better to negative feedback (Bandura, 1991, 2012). Accordingly, nascent entrepreneurs with high self-efficacy should be more likely to overcome the intention to action gap and succeed in creating a new business. Indeed, research has supported these theoretical predictions by showing that nascent entrepreneurs' self-efficacy is positively related to business creation (Rauch & Frese, 2007).

Despite the intuitive appeal of the benefits associated with self-efficacy, a growing number of studies draw from Powers' (1973) control theory and challenge the notion that higher self-efficacy is necessarily better (Vancouver & Purl, 2017). In fact, there may be 'too much of a good thing' regarding self-efficacy (Grant & Schwartz, 2011; Pierce & Aguinis, 2013). For example, self-efficacy can lead to unattainable goals, which negatively affects performance (Baron, Mueller, & Wolfe, 2016). Moreover, once goals are set and a person

strives to achieve a goal, control theory predicts that high self-efficacy results in reduced effort allocation because it signals that less effort is needed for goal accomplishment. Indeed, multiple studies have demonstrated that high self-efficacy can lead to complacency and reduced effort allocation, resulting in a curvilinear relationship between self-efficacy and goal accomplishment (Beck & Schmidt, 2012; Sun, Vancouver, & Weinhardt, 2014).

In this paper, we attempt to integrate the competing lines of theorizing regarding the consequences of self-efficacy for enacting entrepreneurial intentions. Our conceptual starting point is the assumption that social cognitive and control theory are both valid but highlight different facets of self-regulation. Social cognitive theory focuses on self-efficacy as a motivational mechanism that enables a person to self-generate motivation (Bandura, 1997), while control theory focuses on the self-regulatory influence of perceived discrepancies between the current state and a desired future state (Carver & Scheier, 1982; Vancouver, 2005). To integrate these theories, we take into account that self-efficacy is dynamic and varies over time as a person strives to achieve a goal (Bledow, 2013; Peng, Schaubroeck, & Xie, 2015; Sitzmann & Yeo, 2013). According to this dynamic account, variability in self-efficacy enables the integration of discrepancy perception and self-motivation as competing motivational processes that support the enactment of entrepreneurial intentions. Moreover, the proposed positive effect of variability in self-efficacy implies an inverted u-shaped relationship between self-efficacy and goal achievement when a cross-sectional perspective is adopted and self-efficacy is examined at one point in time (see Figure 1).

By presenting a dynamic account of self-efficacy in entrepreneurship, this article contributes to three streams of research. First, it contributes to the entrepreneurship literature and addresses the intention to action gap in entrepreneurship. Specifically, we add to the literature that seeks to answer the question why some nascent entrepreneurs are more likely than others to enact their intentions and succeed in creating a new business. Scholars consider this to be one of the theoretical core questions in entrepreneurship (Frese, 2009; McMullen &

Shepherd, 2006). We study this phenomenon longitudinally in a high stakes context using change in business ownership as the outcome. Our sample consists of nascent entrepreneurs who aspired to start a business in two African countries. In this context, starting a business is one of the few career opportunities available to people who graduate from university because of the adverse labor market conditions (Gielnik & Frese, 2013; Reynolds, 2012).

Second, our dynamic account of self-efficacy contributes to the ongoing debate about the motivational consequences of self-efficacy during goal striving and attempts to resolve apparent contradictions. Previous studies in the field of entrepreneurship emphasized the positive consequences of self-efficacy for goal achievement as postulated by social cognitive theory (Hmieleski & Baron, 2008; Rauch & Frese, 2007; Townsend, Busenitz, & Arthurs, 2010). Yet, control theory and research in other domains than entrepreneurship has challenged this notion (Sitzmann & Yeo, 2013; Vancouver, Gullekson, Morse, & Warren, 2014). We attempt to move beyond these contradictions by integrating elements of social cognitive and control theory. The resulting model explains the role of variability in self-efficacy as well as the curvilinear effect of self-efficacy for goal achievement.

Lastly, we contribute to research on intraindividual variability as an important parameter that differentiates people and that is related to behavioral outcomes (Fleeson, Malanos, & Achille, 2002). Recent research has examined the consequences of intraindividual variability in domains other than entrepreneurship, for example in emotional labor and organizational justice, and provided evidence for the important role of intraindividual variability (Beal, Trougakos, Weiss, & Dalal, 2013; Matta, Scott, Colquitt, Koopman, & Passantino, 2017; Scott, Barnes, & Wagner, 2012). This line of research is based on the tenet of whole trait theory that individuals differ in the amount of intraindividual variability in cognitions, emotions, and behavior they display over time (Fleeson & Jayawickreme, 2015; Fleeson et al., 2002). Our study provides evidence that the central tenet of whole trait theory also holds for the motivational construct of self-efficacy. By demonstrating that variability in

self-efficacy has a motivational function for goal achievement, we open new avenues for motivation research and extend theories of motivation.

Entrepreneurial Self-Efficacy and Starting a Business

Entrepreneurial self-efficacy refers to people's confidence in their abilities to perform entrepreneurial tasks and to create a business (Chen, Greene, & Crick, 1998; McGee, Peterson, Mueller, & Sequeira, 2009). According to social cognitive theory, self-efficacy is a motivational mechanism that has two functions for goal achievement: first, it promotes the development of goals and second, it strengthens the link between goals and goal achievement (Bandura, 1991). Regarding the first function, research has provided consistent evidence that entrepreneurial self-efficacy positively influences the development of entrepreneurial goals (Baron et al., 2016; Schlaegel & Koenig, 2014). Regarding the second function, findings are inconclusive. In fact, recent evidence in domains other than entrepreneurship suggests that during goal striving, that is after goals have been formed, self-efficacy can hinder goal achievement (Beck & Schmidt, 2018; Vancouver, Thompson, & Williams, 2001). The focus of the present study is therefore on this second function of self-efficacy. In the following, we review the literature on the role that self-efficacy plays during goal striving before developing hypotheses based on a dynamic account of self-efficacy.

The Motivational Functions of Self-Efficacy

Creating a new business involves a long chain of actions and takes months to complete (Reynolds & Curtin, 2008). Thus, the goal to create a business cannot be carried out at once but requires aspiring entrepreneurs to break down the overall goal into a series of sub-goals and to enact them step-by-step (Frese, 2009; Gielnik, Frese, & Stark, 2015). In line with social cognitive theory, we argue that self-efficacy supports the enactment of sub-goals during goal striving. We use the concept of entrepreneurial intentions to refer to the sub-goals entrepreneurs develop to enact the overall goal of creating a business. Entrepreneurial intentions reflect people's willingness to invest effort into performing entrepreneurial

activities to start a business, such as assembling resources and setting up operational procedures (Gielnik et al., 2014; Zhao, Seibert, & Hills, 2005). When entrepreneurial intentions are formed, behavioral execution is temporarily inhibited to prevent their premature enactment (Goschke & Kuhl, 1993; Kuhl, 2000). When opportunities for enactment are encountered, nascent entrepreneurs need to generate the motivation to retrieve and implement their intentions (Kazen & Kuhl, 2005).

Self-efficacy is a mechanism that enables people to self-generate the motivation to enact their intentions (Bandura, 1991, 2012; Kuhl, 2000). Specifically, once a suitable opportunity to enact an intention is encountered, a person has to self-generate positive affect to overcome behavioral inhibition and to enter a state of high motivation and action orientation (Diekhof & Gruber, 2010; Kazen, Kaschel, & Kuhl, 2008; Kuhl & Kazen, 1999). Self-efficacy supports this process of self-motivation because people can create positive expectations regarding future performance based on memories of relevant past experiences (Bandura, 1997; Baumgartner, Pieters, & Bagozzi, 2008; McAuley & Courneya, 1992; Schutte & Malouff, 2016; Segerstrom & Sephton, 2010). The ability to create positive expectations regarding future performance also buffers against negative emotions and thereby helps to sustain goal striving (Bandura, 1997; Ozer & Bandura, 1990). For example, research has demonstrated that people with high self-efficacy can motivate themselves to show functional behavior and high performance when confronted with negative emotions (Bandura & Cervone, 1983; Lee, Hwang, Hawkins, & Pingree, 2008). In line with the reasoning that self-efficacy enables people to generate the motivation to enact their intentions, research in entrepreneurship has found that nascent entrepreneurs are more likely to start and successfully manage a business when their entrepreneurial self-efficacy is high (Rauch & Frese, 2007).

The Role of Perceived Discrepancies

Despite its adaptive function during goal striving, self-efficacy may have negative side-effects that can reduce the likelihood of goal accomplishment. According to control theory,

the positive expectations associated with self-efficacy reduce the perceived discrepancy between the current state and a desired future state. As a result, people may invest less effort and fail to achieve a goal (Vancouver & Kendall, 2006). Specifically, an intention creates a discrepancy between a current state and a desired future state, which people attempt to reduce by allocating resources, such as effort, to a task. The magnitude of the perceived discrepancy influences the amount of effort people invest. The higher the perceived discrepancy, the more effort people invest to achieve their goal (Carver & Scheier, 1990). High self-efficacy, however, signals that a goal is easy to achieve, thus reducing the perceived discrepancy (Klein, 1989). Hence, for any given goal, high self-efficacy is accompanied by low perceived discrepancies and reduced effort allocation.

In support of control theory, multiple studies have found that self-efficacy can indeed reduce the amount of effort people invest in pursuing a goal (Vancouver et al., 2014; Vancouver, Thompson, Tischner, & Putka, 2002; Vancouver & Kendall, 2006). When self-efficacy is high, people underestimate the difficulties involved in goal accomplishment and assume that success can be achieved by investing few resources. Less time and effort is then allocated to activities necessary for goal achievement, such as planning, preparing, and executing a task, which leads to reduced performance (Beck & Schmidt, 2012; Vancouver et al., 2014, 2001). Moreover, when self-efficacy is high, less attention is paid to obstacles or unexpected events that prevent success, which can result in low performance and failure (Vancouver & Kendall, 2006). This phenomenon has been referred to as a complacency effect because high confidence and the absence of self-doubts reduce preparation and effort, and thereby undermine goal accomplishment (Vancouver, More, & Yoder, 2008; Vancouver et al., 2002). Observations consistent with this complacency effect have also been made in the field of entrepreneurship. Koellinger et al. (2007) showed that highly confident nascent entrepreneurs no longer perceived the difficulties and uncertainties involved in entrepreneurship, which resulted in a higher likelihood of failure. Similarly, Gielnik and

colleagues (2014) found that nascent entrepreneurs who perceived lower discrepancies between current and future states were less likely to succeed in becoming a business owner.

In sum, social cognitive theory predicts that entrepreneurial self-efficacy facilitates, while control theory predicts that entrepreneurial self-efficacy undermines the enactment of intentions to start a new business. We suggest that a dynamic account of self-efficacy can help to integrate these competing lines of argument. In the following, we first develop a dynamic account of self-efficacy from a 'longitudinal perspective' that examines the role of variability in self-efficacy. We then derive implications for a 'cross-sectional perspective' that examines self-efficacy at one point in time as a predictor of business ownership.

A Dynamic Account of Self-Efficacy

Our dynamic account of self-efficacy builds on the observation that people's belief in their capabilities is not fixed but variable. For instance, self-efficacy increases when progress is made on a task, while it decreases when difficulties are encountered (Amabile & Kramer, 2011; Sitzmann & Yeo, 2013; Vancouver et al., 2002). Moreover, processes of self-regulation can adjust self-efficacy, for example when people focus on problems, self-efficacy can decline (Sevincer & Oettingen, 2015). In contrast, by adopting an optimistic attitude and convincing oneself that goal achievement is possible, an increase in self-efficacy can be achieved (Latham & Budworth, 2006; Youssef & Luthans, 2007). It is important to note that people differ in the propensity to display variability in self-efficacy and these individual differences appear to be relatively stable over time (Lang, Featherman, & Nesselroade, 1997). Scholars have therefore argued that variability and average level are two facets of self-efficacy that characterize a person and both need to be accounted for (Peng et al., 2015).

We argue that nascent entrepreneurs differ in their average in entrepreneurial self-efficacy as well as the amount of variability they display over time as they move toward the goal of starting a business. We conceptualize variability in self-efficacy as the tendency to display alternations between phases of relatively higher and phases of relatively lower self-

efficacy. While some show little variability around their average level, others show pronounced fluctuations between peaks and troughs. It is important to note that variability and the average of self-efficacy are interrelated facets. As the average of self-efficacy approaches the high or the low end of the self-efficacy continuum, variability decreases and may ultimately approach zero. At any average level of self-efficacy between the two ends of the continuum, there can be variability in self-efficacy.

Our dynamic account of self-efficacy posits that average and variability in self-efficacy support the enactment of entrepreneurial intentions. In line with social cognitive theory, we posit that the tendency to display a high average in self-efficacy is positively related to business ownership because nascent entrepreneurs self-generate the motivation to enact their intentions (Bledow, Schmitt, Frese, & Kuehnel, 2011). The tendency to display variability in self-efficacy, on the other hand, results in phases of reduced self-efficacy during which attention shifts to discrepancies between the current state and a person's goals. Nascent entrepreneurs then detect problems and obstacles, and invest more resources into planning, preparing, and executing actions to overcome these problems and obstacles (Forster & Dannenberg, 2010; Kuhl, 2000). A series of experiments by Oettingen and colleagues provides indirect support for the idea that alternations between phases of high and phases of reduced self-efficacy support goal striving (Kappes & Oettingen, 2011; Oettingen & Mayer, 2002). The studies showed that alternating between positive expectations and a focus on discrepancies led to higher goal commitment and effort than either of these factors alone.

In sum, we argue that nascent entrepreneurs, who show a high average as well as variability in entrepreneurial self-efficacy, capitalize on the motivational benefits of phases of high and phases of reduced self-efficacy. Phases of high self-efficacy, in which a person self-generates motivation, are then interspersed with times when reduced self-efficacy shifts the focus to discrepancies. Variability in entrepreneurial self-efficacy thus adds to the positive effect of average entrepreneurial self-efficacy in predicting business ownership.

Hypothesis 1: Variability and the average in entrepreneurial self-efficacy are positively

related to business ownership.

Hypothesis 1 specified the implication of our dynamic account of self-efficacy from a

longitudinal perspective that examines alternations between phases with high self-efficacy

and phases with reduced self-efficacy. We next specify two implications of our dynamic

account for a cross-sectional perspective that takes a 'snap-shot' and focuses on the level of

entrepreneurial self-efficacy people display at one point in time. First, we argue that the

positive effect of variability on goal achievement implies an inverted u-shaped relationship

between self-efficacy at one point in time and goal achievement. Second, we argue that

variability in self-efficacy is negatively related to exceeding the tipping point of this inverted

u-shaped relationship.

According to our dynamic account of self-efficacy, self-motivation and discrepancy

perception are necessary for goal achievement; however, both motivational processes are

competing. We therefore argue that, when assessed at one point in time, the level of

entrepreneurial self-efficacy associated with the highest likelihood of becoming a business

owner falls below 100% confidence. A person who displays a high level of entrepreneurial

self-efficacy that falls below 100% confidence is able to generate the motivation to enact

intentions, while still perceiving discrepancies to prevent complacency and reduced resource

allocation. It follows that the action energizing effect of self-motivation and discrepancy

perception reaches an optimum for business ownership at some point below 100% confidence.

Based on self-efficacy research as well as the broader psychological literature, we argue

that the range, in which the point estimate of an optimum of self-efficacy lies, is relatively

high. For example, Vancouver et al.'s (2014) research provides a starting point for an

approximation of the range within which this optimum may lie. They produced an

experimental condition of high self-efficacy by giving students inflated feedback about their

performance in solving anagrams. Specifically, the students in the inflated condition received

feedback between 66% and 100% of goal accomplishment, which negatively influenced their performance. These results suggest that self-efficacy exerts negative effects in the range between 66% and 100%. The broader psychological literature suggests that the optimum is close to the high end of the continuum because factors with a negative valence, such as perceived discrepancies and failure experiences, have disproportionally stronger psychological consequences than factors with a positive valence, such as optimistic expectations and success experiences (Baumeister, Bratslavsky, Finkenauer, & Vohs, 2001; Bledow, Carette, Kuehnel, & Bister, 2017; Fredrickson, 2013). Accordingly, even minor discrepancies in the expectation to reach a goal may be sufficient to energize action, while high self-efficacy is needed to generate and sustain the motivation to start a business. We therefore argue that the optimum of self-efficacy lies above 66% and below 100%.

In support of our argument, research in other domains than entrepreneurship has demonstrated that the relationship between self-efficacy and goal achievement follows an inverted u-shape and has an optimum below 100% (Beck & Schmidt, 2012, 2018; Sun et al., 2014; Vancouver et al., 2008). At this optimum, the motivational forces of self-motivation and discrepancy perception presumably reach a balance that results in the highest likelihood of becoming a business owner. We thus hypothesize that entrepreneurial self-efficacy increases the likelihood of becoming a business owner up to a tipping point; beyond this tipping point, the effect of entrepreneurial self-efficacy becomes maladaptive.

Hypothesis 2: There is an inverted u-shaped relationship between entrepreneurial self-efficacy and business ownership; the tipping point of the inverted u-shaped relationship lies between 66% and 100%.

The hypothesized positive effect of variability in self-efficacy on business ownership (Hypothesis 1) and the hypothesized optimum below 100% confidence (Hypothesis 2) are functionally equivalent for goal achievement. Variability in self-efficacy and a high level of self-efficacy below 100% both characterize nascent entrepreneurs, who self-generate

motivation and perceive discrepancies. Moreover, variability and level are two interrelated facets of a person's self-efficacy. Specifically, we next argue that variability in self-efficacy reduces the likelihood that nascent entrepreneurs exceed the optimum in self-efficacy.

When people display variability in self-efficacy, they reevaluate and adjust their competency beliefs in the face of difficulties, prompting them to perceive discrepancies between their current state and their goals. By contrast, when variability is low, people are less sensitive to external or internal cues and may fail to perceive discrepancies (Peng et al., 2015). Variability in self-efficacy may be particularly important for preventing overly high self-efficacy among nascent entrepreneurs, who oftentimes lean toward inflated self-assessments of their capabilities. Nascent entrepreneurs tend to be overly confident regarding success, underestimating the demands of creating a business and the likelihood of failure (Cooper, Woo, & Dunkelberg, 1988; Dawson & Henley, 2013; Koellinger et al., 2007; Simon & Shrader, 2012). However, when nascent entrepreneurs show variability in self-efficacy, they perceive discrepancies, which prevent them from forming an inflated belief in their capabilities. Consequently, they less likely exceed the tipping point of the inverted u-shaped relationship between entrepreneurial self-efficacy and business ownership.

Hypothesis 3: Variability in entrepreneurial self-efficacy is negatively related to exceeding the tipping point of the inverted u-shaped relationship between entrepreneurial self-efficacy and business ownership.

Finally, for a precise test of our dynamic account of self-efficacy in entrepreneurship, it is important to isolate the effect of self-efficacy during goal striving, that is after people have developed strong entrepreneurial intentions. Both social cognitive and control theory expect that the positive motivational consequences of self-efficacy prevail when people lack strong entrepreneurial intentions and have not yet entered a phase of goal striving. In this case, self-efficacy supports the development of intentions so that people may eventually enter a phase of goal striving. Moreover, as long as there are no intentions that need to be enacted, the action

energizing effect of perceived discrepancies for the enactment of intentions is not relevant. Accordingly, we expect a positive linear effect of self-efficacy when entrepreneurial intentions are weak. However, social cognitive and control theory depart regarding the motivational consequences of self-efficacy after strong entrepreneurial intentions have been developed. Social cognitive theory assumes positive consequences, whereas control theory assumes negative consequences (Bandura, 1997; Vancouver et al., 2001).

In line with social cognitive theory, we argue that self-efficacy is positively related to the enactment of intentions because people self-generate motivation during goal striving. When strong entrepreneurial intentions are present but self-efficacy is not sufficiently high, goal accomplishment is unlikely as people do not generate the motivation to act on their intentions. Likewise, and in line with control theory, we argue that the likelihood of goal accomplishment declines when strong intentions are present and self-efficacy reaches its maximum because people perceive no discrepancies and invest insufficient effort to achieve their goals. Accordingly, when strong intentions to start a business are present, the positive effect of self-efficacy on business ownership increases until a tipping point, and then declines. In conclusion, we expect that entrepreneurial intentions serve as a boundary condition and moderate the relationship between entrepreneurial self-efficacy and business ownership.

Hypothesis 4: Entrepreneurial intentions moderate the relationship between entrepreneurial self-efficacy and business ownership such that there is an inverted u-shaped relationship when entrepreneurial intentions are strong and a positive relationship when entrepreneurial intentions are weak.

Method

Setting and Sample of the Study

Our research questions call for repeated measures to assess variability in self-efficacy as well as a longer time frame that allows participants to start a business. We therefore used a research design with a baseline measurement (T1) and two subsequent assessment periods

(see Figure 1). Assessment period I included a 12-week repeated measurement design (W1-W12), followed by assessment period II, which involved a 12-month longitudinal design with two measurements (T2-T3). In assessment period I, we employed a repeated measurement approach with weekly data collections over 12 weeks (W1-W12) to assess variability and average in entrepreneurial self-efficacy. Measuring self-efficacy over 12 weeks to determine people's variability is in line with previous studies on within-person variability in management and entrepreneurship research (Scott et al., 2012; Uy, Foo, & Ilies, 2015). We used assessment period II (T2-T3) to take a snapshot of participants' entrepreneurial self-efficacy in the month after assessment period I (T2) and to determine whether participants had successfully created a business 12 months after assessment period I (T3). The study complied with the ethics guidelines of APA and the European Federation of Psychologists' Associations and was exempt from full review by the research ethics committee.

We used an entrepreneurship training program as an opportunity for data collection. The program was voluntary and free of charge. Using a voluntary training program fulfilled two purposes: First, we wanted to include participants who had the intention to engage in entrepreneurship. Second, our research design required the combination of two different timeframes (12 weeks and 12 months) and high commitment of participants. The setting of the entrepreneurship training program allowed us to repeatedly measure participants' entrepreneurial self-efficacy while they engaged in entrepreneurial goal striving. The training program was implemented at two universities in East Africa (Tanzania and Rwanda). At both universities, we informed students about the opportunity to take part in the entrepreneurship training program through brochures and announcements in lectures and seminars. The training program was an action-oriented entrepreneurship training program spanning a period of 12 weeks with weekly sessions (Frese, Gielnik, & Mensmann, 2016; Gielnik, Frese, Kahara-Kawuki, et al., 2015). The participants received a certificate upon successful completion.

As part of the training program, participants launched and managed a micro business. Participants started different types of businesses, such as providing printing services and selling electronic devices, food, or beverages. During the program, they actively engaged in the entrepreneurial process by preparing, starting, and operating a business in the local business environment. Participants acquired the necessary equipment and raw materials, identified their target market, and eventually made the first sale. In the last session, we declared the program to be over. We asked participants to conclude the micro businesses they had started for training purposes to dispel any obligation to continue running the business because of the request we had made at the beginning of the training program.

Baseline survey (T1). Students interested in taking part in the entrepreneurship training program completed and submitted an application form and the baseline questionnaire (T1). We used the baseline survey to measure the participants' demographic background and the control variables. In total, we received 771 applications (from 362 students in Tanzania and 409 students in Rwanda). Our capacities allowed us to train approximately 220 students at each university. We randomly selected 220 students in Tanzania and 206 in Rwanda from the list of applications, for a total of 426 training participants. The students studied at the following schools or colleges: Business and Economics (68.3%), Social Science (13.9%), Engineering and Technology (7.4%), Education (4.9%), Natural and Applied Sciences (3.6%), and Law (0.6%). Most of students were in the third year of their studies (34.2%). The remaining students were in the first year (19.7%), second year (26.8%), and fourth year (19.2%). The students were on average 23.6 years old and 74.6% of the students were male.

Assessment period I (W1-W12). We collected data during the 12 weeks of the training program. The students completed a weekly questionnaire after each training session (W1-W12). We used the weekly questionnaires to assess the average and variability in entrepreneurial self-efficacy over time. We collected between 231 and 346 questionnaires per week. On average, the students completed 7.68 questionnaires (median = 9). Of the 426

students selected for the training program, 273 students attended at least eight sessions and 280 students attended the last session of the training program. Analyses did not show evidence for systematic attrition. We conducted interviews with the participants who dropped out to identify their reasons for discontinuing with the training program. The main reasons were lack of time and incompatibility of the training schedule with the participants' university schedule.

Assessment period II (T2-T3). The second assessment period began with a measurement in the month after the training program (T2), and it ended with a measurement 12 months after the training program (T3). We used the measurement at T2 to assess participants' entrepreneurial self-efficacy after the training program. We used the measurement at T3 to assess business ownership one year after the training program. It is important to note that the period between T2 and T3 was not part of the training program and thus captures participants' autonomous entrepreneurial goal-striving. We collected data from 306 students at T2 and from 219 students at T3. We tested whether respondents and non-respondents at T2 and T3 differed significantly in the control or main variables that were measured at T1 and T2. The respondents at T2 were more senior in terms of year of study than the non-respondents ($t = 2.62$, $p = .010$) and they had weaker entrepreneurial intentions ($t = 2.31$, $p = .022$). At T3, there were more male participants in the group of respondents than in the group of non-respondents ($t = 3.02$, $p = .003$). Furthermore, non-respondents at T3 showed higher entrepreneurial self-efficacy at T2 ($t = 3.68$, $p < .001$) and a higher average in entrepreneurial self-efficacy across the 12 weeks of the training program ($t = 3.94$, $p < .001$) compared to respondents. Because of missing values, we could perform our analyses with a sample size of N = 241 when predicting measures entrepreneurial self-efficacy at T2 and a sample size of N = 190 when predicting business ownership at T3.

Measures

Entrepreneurial self-efficacy. We measured entrepreneurial self-efficacy before (T1) and after the training program (T2). At both measurement waves, we used 12 items, which referred to participants' confidence to perform entrepreneurial tasks. Specifically, the items asked "How confident are you that you can" followed by 12 entrepreneurial tasks (e.g., "start a business", "identify business opportunities", or "find financial capital for starting a business"). The items have been developed in a context similar to the present study (Gielnik, Frese, Kahara-Kawuki, et al., 2015). We measured participants' entrepreneurial self-efficacy using a 5-point scale with anchors ranging from 20% to 100% confidence. We computed the mean across the 12 items to form our measure of entrepreneurial self-efficacy. The internal consistency of the scale was Cronbach's Alpha = .93 at T1 and .92 at T2.

Variability and average in entrepreneurial self-efficacy. We measured entrepreneurial self-efficacy during the 12 weeks of the training program by using four out of the 12 items used before and after the training program. Using a reduced number of items in multiple repeated measurements is appropriate to reduce participants' burden (Uy, Foo, & Aguinis, 2010). We asked respondents "How confident are you that you can" followed by four entrepreneurial tasks ("start a business", "become self-employed", "overcome problems when starting a business", and "manage a business well"). Participants responded to the items on a 5-point scale with anchors ranging from 20% to 100%. The internal consistency of the scale was good with Cronbach's Alphas ranging between .80 and .91 during the 12 weeks of the training program. Participants completed the items after each training session. Based on the weekly measurements of entrepreneurial self-efficacy, we computed variability and average in entrepreneurial self-efficacy for each participant. We used the standard deviation across the 12 measurements as our measure of variability in entrepreneurial self-efficacy. Using the standard deviation as a measure of intraindividual variability is justified because it captures the range and amplitude of people's different states across time. Specifically, a larger standard deviation reflects the extreme levels that participants experience over time and the

deviations from their average level (Houben, Van Den Noortgate, & Kuppens, 2015). Research has shown that the standard deviation is among the most effective indices for operationalizing intraindividual variability (Cole, Bedeian, Hirschfeld, & Vogel, 2011; Dalal, Bhave, & Fiset, 2014). Accordingly, it has been frequently used by studies in psychology and management to assess intraindividual variability (e.g., Matta et al., 2017; Scott et al., 2012).

We also used alternative approaches toward operationalizing variability in entrepreneurial self-efficacy to provide evidence for the robustness of our findings independent of the operationalization of variability. We used the amplitude (i.e., the difference between personal maximum and minimum values across the twelve weeks), the greatest positive deviation from the personal mean (i.e., personal maximum value minus personal mean), the greatest negative deviation from the personal mean (i.e., personal mean minus personal minimum value), and the mean squared successive difference (MSSD; i.e., the mean of squared differences of values at t+1 and t). The MSSD captures changes from one episode to the next instead of changes over the total period of time (Houben et al., 2015; von Neumann, Kent, Bellinson, & Hart, 1941).

Entrepreneurial intentions. We measured entrepreneurial intentions before (T1) and after the training program (T2). We used five items based on Ajzen (1991) and Gollwitzer (1999). The items asked participants to indicate whether they intended to perform entrepreneurial activities in the next six months ("Within the next six months, do you intend to"). The five entrepreneurial activities were "discuss a business idea with business professionals", "organize a start-up team or look for partners", "do market research for a business idea", "look for equipment or a location for a business", and "work on a business plan for a business idea". We used a 5-point Likert scale ranging from "Not at all" to "Very much" to measure participants' degree of intending to perform each activity. We computed the mean across the five items for our scale of entrepreneurial intentions. The internal consistency of the scale was Cronbach's Alpha = .87 at T1 and .85 at T2.

Business ownership. We asked participants before the training program (T1), at the end of the training program (T2), and one year after the training program (T3) whether they were currently the owner of a business ("Are you currently the owner of a business?"). We coded participants' responses as 1 ("yes") and 0 ("no"). If participants answer was 'yes', we validated the answer by asking for the business' main product or service, sales level, profits, and number of employees. Business ownership at T1 measures whether participants had already created a business before the training program. Business ownership at T2 captures whether participants had successfully started a micro business during the training program. Business ownership at T3 measures whether participants were business owners one year after the training program and serves as the dependent variable of our study. We controlled for business ownership at T2 in our statistical analyses and thus predicted change in business ownership between T2 and T3 as an operationalization of whether participants had become a business owner after the training program. This operationalization differentiates participants who sustained the micro business they had started during the training program or created a new business after the training program from participants who did neither.

Control variables. We controlled for gender because previous research provided evidence for a gender gap in entrepreneurship (Klapper & Parker, 2011). We controlled for year of studies to account for the time until graduating from university. We measured gender (0 = female, 1 = male) and year of studies in the baseline questionnaire at T1. We included a dummy variable for university (0 = Tanzania, 1 = Rwanda) to control for differences in the students' likelihood to engage in entrepreneurship in the two countries (Frese et al., 2016).

Results

Table 1 displays the means, standard deviations, and correlations. Entrepreneurial self-efficacy was higher at T2 ($M = 4.38$) than at T1 ($M = 4.05$) and entrepreneurial intentions were higher at T2 ($M = 4.46$) than at T1 ($M = 4.12$). Paired t-tests showed that both differences were significant ($t = 9.00$, $p < .001$ and $t = 7.01$, $p < .001$), suggesting that the

training program increased participants' confidence in their entrepreneurial skills and their entrepreneurial intentions. Moreover, entrepreneurial self-efficacy and entrepreneurial intentions showed lower standard deviations at T2 than at T1. The lower standard deviations suggest potential range restrictions, producing a downward bias of the estimated regression coefficients (Hunter, Schmidt, & Le, 2006).

At T1 the rate of business owners among participants was 7%, and at T2 the rate was 47%. Analyses of participants' answers about the businesses they owned showed that the increase between T1 and T2 was due to the micro businesses participants had started during the training program and decided to continue after the training program. We asked participants to conclude these businesses at the end of the training program, and the decision to continue with the businesses was therefore of participants' own free will. Note that when participants decided to continue the micro-businesses, they still had to engage in entrepreneurial goal-striving and invest resources between T2 and T3 in order to develop the micro businesses into full-fledged businesses that continued to operate one year after the training program. One year after the training program (T3), the rate of business owners among participants was 52%.

The average of entrepreneurial self-efficacy aggregated across the 12 weeks of the training program (W1-W12) was positively correlated with entrepreneurial self-efficacy at T1 ($r = .53$, $p < .001$) and at T2 ($r = .60$, $p < .001$) supporting the reliability and conceptual relatedness of our measures before, during, and after the program. Entrepreneurial self-efficacy at T2 was significantly correlated with business ownership at T3 ($r = .30$, $p < .001$), suggesting a positive effect of entrepreneurial self-efficacy on business ownership. Furthermore, we found a negative relationship between variability and average in entrepreneurial self-efficacy ($r = -.43$, $p < .001$). A higher average was thus related to lower variability.

We next estimated the within-person variance in entrepreneurial self-efficacy across the 12 weeks of the training program (W1-W12) by calculating a null model with a random intercept for participants. The analyses revealed that 46% of the variance in entrepreneurial self-efficacy was within-person variance. This is in line with findings that about half of the variance in motivational variables resides within persons (N. P. Podsakoff, Spoelma, Chawla, & Gabriel, 2019). Moreover, we observed substantial individual differences in intraindividual variability in entrepreneurial self-efficacy ($M = 0.33$, $SD = .20$, range $= 0.00–0.96$). Figure 2 illustrates different patterns of participants' entrepreneurial self-efficacy over the 12 weeks of the training program. Panel A shows three representative participants with high variability and high, medium, or low average entrepreneurial self-efficacy. Panel B shows three representative participants with low variability and high, medium, or low average entrepreneurial self-efficacy. We note that a low average in entrepreneurial self-efficacy corresponds to a value of approximately 4 on a 5-point scale. We thus do not use the term low in an absolute sense, but only to describe participants relative to other participants in our sample.

We calculated a series of confirmatory factor analyses to provide evidence for the discriminant validity of our measures. Specifically, we tested whether entrepreneurial self-efficacy and entrepreneurial intentions at T1 and T2, respectively, were independent factors. The four-factor solution showed a statistically better model fit than any two-factor solution or one-factor solution based on the different possible combinations of the four factors (all Chi-squared differences > 845.27, all p's $< .001$). Moreover, we computed 12 separate models with the four indicators of each week loading on one factor of entrepreneurial self-efficacy. All 12 models showed a good model fit (all CFI's $> .96$, all TLI's $> .91$, all SRMR's $< .04$). The full results are available in the online supplement.

Tests of Hypotheses

We grand-mean centered all independent variables before running the regression analyses, which implies that we used contrast coding for the dichotomous independent variables. Hypothesis 1 states that variability and average in entrepreneurial self-efficacy are positively related to business ownership. We computed logistic regression analyses with business ownership one year after the training program (T3) as dependent variable and variability and average in entrepreneurial self-efficacy (W1-W12) as independent variables. Note that we included business ownership at T2 as a control variable to model change in business ownership. Table 2 presents the results. In Model 1, we included the control variables. In Model 2, we entered variability and average in entrepreneurial self-efficacy as predictor variables. The results showed that average in entrepreneurial self-efficacy had a positive and significant effect on business ownership at T3 ($B = 1.12$, $p = .015$). A one unit increase in the average in entrepreneurial self-efficacy increases the odds of becoming a business owner by a factor of 3.07. Furthermore, variability in entrepreneurial self-efficacy had a positive and significant effect on business ownership at T3 ($B = 2.13$, $p = .025$). A one unit increase in variability in entrepreneurial self-efficacy increases the odds of becoming a business owner by a factor of 8.38. The results suggest that variability in entrepreneurial self-efficacy explained variance in business ownership beyond the positive effect of average entrepreneurial self-efficacy. The finding thus provided support for Hypothesis 1.

Hypothesis 2 states that the relationship between entrepreneurial self-efficacy and business ownership follows an inverted u-shape and that the tipping point lies above 66% entrepreneurial self-efficacy. In Model 3, we entered entrepreneurial self-efficacy and entrepreneurial self-efficacy squared as a term for the curvilinear effect into the equation. We found a significant main effect of entrepreneurial self-efficacy at T2 on business ownership at T3 ($B = 1.11$, $p = .024$). A one unit increase in entrepreneurial self-efficacy increased the odds of becoming a business owner by a factor of 3.04. The effect of entrepreneurial self-efficacy squared was negative and significant ($B = -2.20$, $p = .040$) such that a one unit increase

decreased the odds of becoming a business owner by a factor of 9.09 (the inverse of 0.11).

The negative coefficient of the squared term indicates that the relationship between

entrepreneurial self-efficacy and business ownership followed an inverted u-shape (see Figure

3). The findings thus supported Hypothesis 2. Calculating the first order derivate revealed that

the inflection point (or local maximum) was at a value of 4.65 for entrepreneurial self-efficacy

(on the 5-point scale or 93.0% confidence based on the anchors of the scale). Furthermore, the

effect of variability on business ownership became non-significant when including the

curvilinear effect in the equation ($B = 1.21$, $p = .23$). This finding suggests that there is an

overlap in the variance explained by variability and the curvilinear effect, providing support

for the assumption that variability and the curvilinear effect are functionally equivalent.

Hypothesis 3 posits a negative relationship between variability in entrepreneurial self-

efficacy and the extent to which nascent entrepreneurs exceed the tipping point of the

curvilinear effect of self-efficacy on business ownership. To test Hypothesis 3, we used the

local maximum of 4.65 (or 93.0%, respectively) as an estimation of the tipping point. Based

on the local maximum, we computed the extent to which participants exceeded the local

maximum of 4.65. We label the resulting variable *overshooting* in entrepreneurial self-

efficacy. Given the maximum value of 5.00 (=100%) for entrepreneurial self-efficacy, the

values for overshooting ranged between 0.00 and 0.35. Overshooting thus operationalizes the

extent to which entrepreneurial self-efficacy measured after the training program exceeded the

level that was optimal for becoming a business owner. Table 3 displays the results of

regression models that predict overshooting in entrepreneurial self-efficacy after the training

program (T2) with average and variability in entrepreneurial self-efficacy during the training

program (W1-W12) as predictors. Model 1 included only the control variables. In Model 2,

variability in entrepreneurial self-efficacy (W1-W12) had a negative and significant effect on

overshooting ($B = -0.16$, $p < .001$), providing support for Hypothesis 3. The results show that

nascent entrepreneurs who display variability in entrepreneurial self-efficacy were less likely

to exceed the level of entrepreneurial self-efficacy that was optimal for becoming a business owner.

As additional analyses, we examined whether variability in entrepreneurial self-efficacy was particularly relevant for nascent entrepreneurs, who displayed a high average in entrepreneurial self-efficacy during the training program. We added the interaction effect of variability and average in entrepreneurial self-efficacy in Model 3. The interaction effect was negative and significant ($B = -0.33$, $p < .001$). Figure 4 illustrates the negative effect of variability on overshooting contingent on average in entrepreneurial self-efficacy. According to simple slope analyses the effect of variability in entrepreneurial self-efficacy on overshooting was negative and significant ($B = -0.23$, $p < .001$) for one standard deviation above the mean in average entrepreneurial self-efficacy. For one standard deviation below the mean, the effect of variability on overshooting was non-significant ($B = 0.05$, $p = .354$). The results demonstrate that the negative effect of variability on overshooting in self-efficacy is stronger, the higher nascent entrepreneurs' average self-efficacy.

Finally, we tested Hypothesis 4, which states that entrepreneurial intentions serve as a boundary condition for the curvilinear relationship between entrepreneurial self-efficacy and business ownership. To test Hypothesis 4, we entered entrepreneurial intentions and the respective interaction terms into the model predicting business ownership at T3 (Table 2). The interaction term between entrepreneurial self-efficacy squared and entrepreneurial intentions was negative and significant ($B = -2.26$, $p = .046$). To display the interaction (see Figure 5), we predicted the probabilities of business ownership along the values of entrepreneurial self-efficacy for high and low values in entrepreneurial intentions (one standard deviation above and below the mean for strong and weak entrepreneurial intentions respectively). For weak entrepreneurial intentions, there was a positive relationship between entrepreneurial self-efficacy and business ownership without a tipping point. For strong entrepreneurial intentions, the likelihood of becoming a business owner reached a peak and then declined. After

accounting for the moderation effect of entrepreneurial intentions, the first order derivate showed that the inflection point was at a value of 4.48 for entrepreneurial self-efficacy (89.6% confidence).These results support Hypothesis 4 and show that entrepreneurial intentions serve as a boundary condition for the inverted u-shaped relationship. As supplementary analyses, we reran our test of Hypothesis 3 based on the inflection point for entrepreneurial self-efficacy when the moderating effect of entrepreneurial intentions is taken into account (89.6% instead of 93.0%). Results remained the same: Variability in entrepreneurial self-efficacy (W1-W12) had a negative and significant effect on overshooting (B = -0.24, $p < .001$) and the interaction effect between variability and average in entrepreneurial self-efficacy was also negative and significant (B = -0.47, $p < .001$).

Robustness Checks

We performed several robustness checks to validate our findings (see the online supplement for the tables with the full results). First, we used the amplitude, greatest positive deviation and greatest negative deviation from the personal average, and MSSD as alternative approaches of operationalizing variability in entrepreneurial self-efficacy. We computed regression analyses using the same control variables as in the main analyses. Overall, results were consistent with the findings that used the standard deviation as a measure of variability. Specifically, when using the amplitude as a measure of variability, we found a positive and significant effect on business ownership at T3 (B = 0.72, $p = .035$). The effect on overshooting in entrepreneurial self-efficacy at T2 was negative and significant (B = -0.06, $p < .001$). Similarly, the greatest positive deviation had a positive and significant effect on business ownership (B = 1.33, $p = .047$) and a negative effect on overshooting in entrepreneurial self-efficacy at T2 (B = -0.12, $p < .001$). When using the greatest negative deviation, the effect on business ownership failed to become significant (B = 0.73, $p = .113$). However, the effect on overshooting in entrepreneurial self-efficacy at T2 was significant (B = -0.06, $p = .009$). Finally, MSSD had a significant effect on business ownership at a 10%-

level of significance ($B = 1.49$, $p = .085$). The effect on overshooting in entrepreneurial self-efficacy at T2 was significant ($B = -0.12$, $p = .006$).

We conducted several robustness checks to test whether excluding the control variables changed the pattern of results. First, excluding the control variables did not change the results regarding the effects of variability, average in entrepreneurial self-efficacy, and overshooting in entrepreneurial self-efficacy on business ownership at T3. Second, excluding the control variables of business ownership at T2 and university resulted in non-significant coefficients for entrepreneurial self-efficacy squared ($B = -1.37$, $p = .149$) and for the interaction between entrepreneurial self-efficacy squared and entrepreneurial intentions ($B = -1.22$, $p = .209$). Inclusion of the control variables of business ownership at T2 and university is, however, warranted so that change in business ownership from T2 to T3 is modeled and the differences in participants' general likelihood (i.e., intercepts) of business ownership at T3 in Rwanda and Tanzania is accounted for. Finally, we performed our analyses in the subsamples of Rwanda and Tanzania to provide evidence for the robustness and reproducibility of findings in different contexts (Bettis, Ethiraj, Gambardella, Helfat, & Mitchell, 2016; Open Science Collaboration, 2015). We found that the intercepts in the two subsamples were different, but the pattern of effect sizes was consistent in direction and similar in strength across the two subsamples as well as in comparison with the total sample. We therefore conclude that our findings are robust and replicable across different samples.

Discussion

Whenever employment opportunities and well-trodden career paths are scarce, creating a business is one of the few available avenues toward economic prosperity. Accordingly, the rate of people with the intention to start a business can exceed 60% in developing countries, such as the ones we studied (Bosma & Kelley, 2018). Even in developed countries, such as the US, Canada, and Germany, the rate of people intending to start a business has almost doubled over the last 10 years (Global Entrepreneurship Research Association, 2019).

Entrepreneurial intentions, however, are only a first step toward entrepreneurial action and eventual business ownership. Once people have 'crossed the Rubicon' and strive to achieve the goal of becoming a business owner, the support of self-regulatory processes is necessary to warrant goal achievement (Heckhausen & Gollwitzer, 1987). This article examined nascent entrepreneurs' self-efficacy as a critical factor of self-regulation during goal striving.

People's beliefs in their abilities are widely considered an important factor for enacting intentions, yet theoretical predictions and empirical findings regarding the consequences of self-efficacy for goal achievement remain conflicting (Bandura, 2012; Beck & Schmidt, 2012; Vancouver et al., 2001; Yeo & Neal, 2013). In an attempt to address these contradictions, we developed a dynamic account of entrepreneurial self-efficacy and its link to business ownership. Results of a longitudinal study with nascent entrepreneurs in Africa provided support for our predictions. The study showed that variability and the average in entrepreneurial self-efficacy participants displayed during an entrepreneurship training program were positively related to business ownership in the subsequent year. Entrepreneurial self-efficacy after the training program showed an inverted u-shaped relationship with business ownership when strong entrepreneurial intentions were present. Furthermore, variability in entrepreneurial self-efficacy prevented nascent entrepreneurs from exceeding the tipping point, at which the likelihood of becoming a business owner reached a peak. We believe the results of this study have important theoretical and practical implications.

Theoretical Implications

According to our dynamic account, self-efficacy is not a fixed belief but a dynamic process (Bledow, 2013). Variability in self-efficacy has unique motivational consequences over and above the overall level in self-efficacy a person displays. Variability involves phases with high self-efficacy, during which a person generates motivation, and phases with reduced self-efficacy, during which the focus shifts to discrepancies. The dynamic account of self-efficacy offers a new perspective that has theoretical implications for social cognitive and

control theory. Social cognitive theory highlights the benefits of self-efficacy (Bandura, 1991). Our study extends this perspective by demonstrating that temporary reductions in self-efficacy that are reflected in variability and an optimum below 100% confidence serve a critical function and energize goal striving. These findings are in line with predictions of control theory that the perception of discrepancies facilitates goal achievement. Furthermore, our study extends control theory, which holds that self-efficacy plays an adaptive role only for the development and maintenance of goals (Sun et al., 2014; Vancouver et al., 2008). In line with social cognitive theory, our study supports the assumption that self-efficacy also has a motivational function during goal striving, that is after people have developed goals.

Our study conceptually and empirically links intraindividual variability to an inverted u-shaped relationship and argues that both are functionally equivalent. Variability refers to temporal alternations between phases of high and phases of reduced self-efficacy, while the inverted u-shaped relationship refers to an optimal balance at one point in time. In recent years, the importance and prevalence of inverted u-shaped relationships has attracted attention in applied psychology and management research (Grant & Schwartz, 2011; Pierce & Aguinis, 2013). Yet, although the general notion that there is "too-much-of-a good thing" may be readily embraced, theoretical models are often not well equipped for providing explanations for inverted u-shaped relationships. Our dynamic account suggests that one explanation for such relationships is that variables that have an inverted u-shaped relationship with an outcome capture competing processes with distinct functions. Our study showed that average and variability in self-efficacy were positively related to business ownership but negatively related with each. When only a 'snap-shot' of self-efficacy is taken at one point in time, an inverted u-shaped relationship can be expected because there is an optimum, at which the combined positive effect of average and variability reaches a maximum. The same theoretical rationale may help to explain other inverted u-shaped relationships. For instance, Grant (2013) showed an inverted u-shaped relationship between extraversion and sales performance

and proposed that moderate levels of extraversion refer to a balance between listening and talking. In this case, extraversion presumably captures talking and listening as two competing processes that serve distinct functions for goal achievement. Our theoretical rationale suggests that this inverted u-shaped relationship corresponds to variability between phases of talking and phases of listening.

The idea that both level and variability in a construct have important functions can be described by the concept of a dynamic equilibrium. A dynamic equilibrium refers to a constant motion between competing forces (Smith & Lewis, 2011) or as continuously deviating from and reverting to the equilibrium (Headey, 2006). According to our model, self-motivation and discrepancy perception are the competing forces that give rise to a certain dynamic equilibrium in self-efficacy. A dynamic equilibrium has both stable and variable properties. The stable aspect is captured by the average level of self-efficacy a person displays, while variability in self-efficacy describes how much a person deviates from this level over time. Our study provides a reference point for an optimal dynamic equilibrium of self-efficacy in entrepreneurship—a domain in which people often exceed a level that is adaptive for goal achievement. Having approximately 90% of confidence in one's ability and displaying some degree of variability around this level is significantly more adaptive for goal achievement than 100% confidence, which implies no variability. It needs to be noted, however, that both the level and the degree of variability in self-efficacy that are adaptive for goal striving are likely to vary as a function of personal and contextual factors. Moreover, a limitation of our study is that we did not measure the processes that presumably give rise to a certain dynamic equilibrium in self-efficacy. Future research is needed that directly examines these cognitive and affective processes and models how they unfold over time, presumably in a non-linear and reciprocal manner (Kuhl, 2000).

Besides informing social cognitive and control theory, our study also contributes to the literature on intraindividual variability. While a rapidly growing body of research in applied

psychology examines intraindividual variance by studying discrete within-person changes as the unit of analysis (N. P. Podsakoff et al., 2019), less attention has been paid to studying individual differences in this variance and its behavioral consequences. In comparison, research building on whole trait theory (Fleeson & Jayawickreme, 2015) aggregates observations across multiple points in time to capture individual differences in people's variability. This research has recognized that systematic individual differences reside in the degree of intraindividual variability people display. It is noteworthy that most studies in this line of research have focused on the negative consequences of intraindividual variability. For example, research has shown that variability in emotional labor has negative effects on job satisfaction and productive work behaviors (Scott et al., 2012), being treating inconsistently fair by supervisors is worse than being treated consistently unfair (Matta et al., 2017), and variability in affect increases strain and decreases well-being (Beal et al., 2013; Houben et al., 2015). Interestingly, fewer studies have focused on the adaptive benefits of intraindividual variability (Bledow et al., 2011; Lievens et al., 2018). In line with the focus on such adaptive benefits, our study suggests that variability in self-efficacy has unique motivational functions. Our findings imply that models of work motivation need to be extended to address how individual differences in intraindividual variability influence goal accomplishment.

Practical Implications

Our dynamic account of self-efficacy holds practical implications for different stakeholders involved in the fields of entrepreneurship and management. While we agree with social cognitive theory that mastery experience, vicarious learning, and verbal persuasion can lead to motivational benefits by raising people's self-efficacy (Gist & Mitchell, 1992), we warns against attempts to maximize people's self-efficacy. Instead, we suggest that aspiring entrepreneurs can increase their likelihood of success at creating a business by learning to balance and alternate between a focus on discrepancies and feelings of confidence. When confidence remains high over longer periods of time, it may be effective to counter-regulate

and deliberately focus on barriers and difficulties to ensure the balance that stimulates action (Kappes & Oettingen, 2011). On the other hand, when confidence drops and remains low over extended periods, it will become important to develop an optimistic attitude, for instance by remembering past successes and envisioning future successes (Bandura, 1997). Insights into the benefits of variability in self-efficacy may help entrepreneurs to constructively deal with and appreciate the motivational benefits of episodes of reduced self-efficacy instead of giving up when confidence is low.

The findings of this study also hold implications for people who need to predict the success of aspiring entrepreneurs, such as venture capitalist and development agencies. High confidence makes an individual appear competent and high in social status even if this is not objectively warranted (Anderson, Brion, Moore, & Kennedy, 2012). This is exemplified by research showing that venture capitalists' funding decisions were influenced not only by the quality of the business opportunity but also by how the business opportunity was presented (Mitteness, Sudek, & Cardon, 2012). Thus, venture capital investors might make suboptimal investment decisions because they overestimate the ability of nascent entrepreneurs with very high self-efficacy. On the other hand, they may fail to invest in nascent entrepreneurs who display some degree of self-doubt but who are more likely to succeed.

For educators and coaches in charge of entrepreneurs, the degree of self-efficacy their clients display is a valuable source of information and a factor that can be influenced. Indeed, enhancing participants' self-efficacy is often a central component of trainings because self-efficacy can support learning and transfer (Colquitt, LePine, & Noe, 2000; Kraiger, Ford, & Salas, 1993; Salas & Cannon-Bowers, 2001). Our study suggests that finding a balance between confidence and discrepancy perception rather than maximizing self-efficacy should be the goal of training and coaching interventions. Increasing participants' self-efficacy too much may backfire and lead to reduced performance. Whether a person's self-efficacy needs to be strengthened or weakened can vary over time and between persons. Indeed,

overconfident individuals may often benefit when trainers reduce their self-efficacy, for instance by pointing out knowledge gaps, whereas individuals with low initial self-efficacy can benefit the most from attempts to increase their confidence (McNatt, 2000; Saks, 1995; Schmidt & DeShon, 2009). The idea that variability in self-efficacy matters is also relevant for the domain of human resource management. Beck and Schmidt (2018) pointed to difficulties managers might face because of contradictory recommendations provided by research on self-efficacy. Some studies suggest that managers should strengthen their employees' self-efficacy, whereas others warn against such measures, cautioning that they may undermine effort allocation and task performance (Vancouver & Kendall, 2006). Accordingly, Beck and Schmidt (2018) noted that the question whether to enhance or attenuate people's self-efficacy remains unanswered. Our study suggests that both approaches will be necessary depending on the person and his or her specific situation. Managerial actions should aim at balancing a person's self-efficacy, which can sometimes require boosting and sometimes diminishing a person's self-efficacy.

Strengths and Limitations

Noteworthy strengths of the study are that it used change in business ownership in a real world setting as the performance criterion and a longitudinal research design. Previous studies on nonlinear consequences of self-efficacy have used controlled laboratory experiments (Beck & Schmidt, 2018; Vancouver et al., 2014, 2008; Vancouver & Kendall, 2006). Our study thus adds to the external validity and generalizability of previous findings by demonstrating an inverted u-shaped relationship between self-efficacy and goal achievement in a field setting. Furthermore, we demonstrated the predictive validity of the inverted u-shaped relationship over a period of 12 months, whereas previous studies examined immediate or short-term effects of self-efficacy on goal achievement. We thereby demonstrate the generalizability of this relationship across different time frames (Gielnik et al., 2014; Mitchell & James, 2001; Zaheer, Albert, & Zaheer, 1999).

Using a longitudinal design over 12 months with several measurements also reduced potential biases of common method variance. We minimized possible bias by the temporal separation of data collection (i.e., variability and average in entrepreneurial self-efficacy during the training program [W1-W12], entrepreneurial self-efficacy at T2, and business ownership at T3), controlling for occasion factors, such as participants' mood (P. M. Podsakoff, MacKenzie, Lee, & Podsakoff, 2003; Spector, 2006). Furthermore, our measures of variability and overshooting in entrepreneurial self-efficacy are less susceptible to possible biases, such as social desirability and acquiescence, because they were computed by calculating the standard deviation and extent to which participants exceeded the optimal level of entrepreneurial self-efficacy. These measures are thus only indirectly based on self-reports.

A potential limitation for the generalizability of our findings is our study context. We conducted our study in Tanzania and Rwanda. These countries have a gross national income per capita of 900 USD and 700 USD, respectively (The World Bank, 2017). In comparison, the gross national income per capita in the United States is 58,030 USD (The World Bank, 2017). Accordingly, we conducted our study in low income countries in which self-regulatory processes, in particular with regard to business creation, might unfold differently (Gielnik et al., 2014). Although research has shown that motivation in general and self-efficacy in particular function universally across different countries (Nagengast et al., 2011; Scholz, Dona, Sud, & Schwarzer, 2002), we acknowledge that our findings need to be replicated in other parts of the world to show that our theoretical model generalizes to other contexts. We would also like to note that scholars have explicitly called for entrepreneurship research in regions that are characterized by poverty, institutional instability, and infrastructural underdevelopment (Arnett, 2008; Bruton, 2010; George, Corbishley, Khayesi, Haas, & Tihanyi, 2016; Kirkman & Law, 2005).

Furthermore, we used an entrepreneurship training program for students as part of our research design to assess variability in entrepreneurial self-efficacy. Thus, a potential

limitation of our study is that we used a student sample at the beginning of the study. We note, however, that most students graduated from university after the training program and transitioned to the workforce. Accordingly, the effect of entrepreneurial self-efficacy on business ownership one year after the training program was observed outside the training and university context. We thus captured the early phase of people's entrepreneurial career and observed real-life transfer in terms of becoming a business owner. A related limitation is that nascent entrepreneurs, in contrast to experienced entrepreneurs, might be more prone to overshoot in entrepreneurial self-efficacy because they have not yet experienced setbacks and challenges that might balance their expectations of success (Ucbasaran, Westhead, Wright, & Flores, 2010). In line with this reasoning, we observed that the participants in our sample had relatively high levels of entrepreneurial self-efficacy. This potentially limits the generalizability of our findings to nascent entrepreneurs at early stages of their careers with relatively high levels of entrepreneurial self-efficacy. However, the majority of nascent entrepreneurship is carried out by first-time entrepreneurs who oftentimes display a high confidence in their capabilities (Koellinger et al., 2007; Reynolds & Curtin, 2008). Arguably, their ability to succeed in creating a business is of particular theoretical and practical relevance.

We note that the non-respondents at T3 showed higher entrepreneurial self-efficacy across the 12 weeks of the training program and at T2 than respondents. Accordingly, non-respondents may have been more likely to become a business owner than respondents if they did not exceed the tipping point of self-efficacy and less likely if they exceeded this tipping point. We therefore simulated different scenarios and found that a different likelihood of business ownership between respondents and non-respondents did not affect our results. Results were only affected given the implausible assumption that non-respondents displayed a stronger linear positive effect of entrepreneurial self-efficacy on business ownership than respondents. We thus conclude that non-respondents were unlikely to have biased results.

Conclusions

We developed a dynamic account of self-efficacy in entrepreneurship to contribute to the understanding of why some nascent entrepreneurs enact entrepreneurial intentions and create a business, whereas others do not. We cautioned against a one-sided tendency to focus only on positive or negative consequences of people's beliefs in their abilities during goal striving. We showed that variability in self-efficacy enables people to capitalize on the motivational benefits associated with phases of high self-efficacy and phases, in which self-efficacy is reduced. The motivational benefits of phases of reduced self-efficacy can explain the inverted u-shaped relationship between entrepreneurial self-efficacy and business ownership.

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Table 1

Means, standard deviations, and correlations of study variables

Variables and Scales	M	SD	1	2	3	4	5	6	7	8	9	10	11	12
1. Entrepreneurial self-efficacy (T1)	4.05	0.71												
2. Entrepreneurial self-efficacy (T2)	4.38	0.50	.38**											
3. Overshooting in entrepreneurial self-efficacy (T2)	0.09	0.14	.32**	.72**										
4. Variability in entrepreneurial self-efficacy (W1-W12)	0.33	0.20	-.32**	-.16**	-.29**									
5. Average in entrepreneurial self-efficacy (W1-W12)	4.42	0.43	.53**	.60**	.47**	-.43**								
6. Entrepreneurial intentions (T1)	4.12	0.91	.50**	.29**	.21**	-.17**	.42**							
7. Entrepreneurial intentions (T2)	4.46	0.57	.23**	.61**	.40**	-.02	.34**	.26**						
8. Business ownership (T1)	0.07	0.25	.09†	.05	.02	-.11†	.15*	.12*	.00					
9. Business ownership (T2)	0.47	0.50	-.02	.06	.02	.12†	.04	.06	.10†	.24**				
10. Business ownership (T3)	0.52	0.50	.04	.30**	.12†	.07	.21**	.12†	.23**	.29**	.34**			
11. University[a]	0.48	0.50	-.28**	-.37**	-.34**	.25**	-.43**	-.42**	-.22**	-.13*	-.15*	-.21**		
12. Gender[b]	0.75	0.44	-.01	.04	.06	.07	-.01	.05	.03	-.04	-.11*	.02	.14**	
13. Year of studies	2.53	1.02	-.03	-.12*	-.13*	-.05	-.03	-.07	-.17**	-.01	-.03	.00	.18**	-.05

Note. [a] 0 = Tanzania, 1 = Rwanda; [b] 0 = female, 1 = male; † $p < .10$, * $p < .05$, ** $p < .01$.

Table 2

Results for entrepreneurial self-efficacy as a predictor of business ownership

Variables	Business ownership (T3)											
	Model 1			Model 2			Model 3			Model 4		
	B	SE	Odds ratio	B	SE	Odds ratio	B	SE	Odds ratio	B	SE	Odds ratio
Intercept	0.07	(0.16)	1.07	0.06	(0.16)	1.06	-0.03	(0.18)	0.97	0.04	(0.22)	1.04
University[a]	-0.94**	(0.36)	0.39	-0.78†	(0.40)	0.46	-0.73†	(0.42)	0.48	-0.83†	(0.43)	0.44
Gender[b]	0.42	(0.43)	1.51	0.27	(0.45)	1.31	0.33	(0.47)	1.39	0.37	(0.48)	1.45
Year of studies	0.07	(0.15)	1.07	0.10	(0.16)	1.11	0.15	(0.17)	1.17	0.18	(0.18)	1.19
Business ownership (T2)	1.39**	(0.32)	4.01	1.37**	(0.33)	3.92	1.55**	(0.35)	4.73	1.61**	(0.36)	5.02
Average in entrepreneurial self-efficacy (W1-W12)				1.12*	(0.46)	3.07	0.26	(0.57)	1.29	0.06	(0.58)	1.06
Variability in entrepreneurial self-efficacy (W1-W12)				2.13*	(0.95)	8.38	1.21	(1.01)	3.34	0.69	(1.05)	2.00
Entrepreneurial self-efficacy (T2)							1.11*	(0.49)	3.04	1.19*	(0.56)	3.30
Entrepreneurial self-efficacy squared (T2)							-2.20*	(1.07)	0.11	-2.24†	(1.26)	0.11
Entrepreneurial intentions (T2)										0.30	(0.43)	1.36
Entrepreneurial self-efficacy × Entrepreneurial intentions (T2)										-1.28	(1.21)	0.28
Entrepreneurial self-efficacy squared × Entrepreneurial intentions (T2)										-2.26*	(1.13)	0.10
Deviance (-2logLik)	231.34			222.68			209.37			205.17		
Pseudo-R^2 (Cox-Snell / Nagelkerke)	.15 / .20			.19 / .25			.24 / .32			.26 / .35		

Note. [a] 0 = Tanzania, 1 = Rwanda; [b] 0 = female, 1 = male; † p < .10, * p < .05, ** p < .01.

Table 3

Predicting overshooting in entrepreneurial self-efficacy after the training (T2) by variability in entrepreneurial self-efficacy (W1-W12)

Variables	Overshooting in entrepreneurial self-efficacy (T2)								
	Model 1			Model 2			Model 3		
	B	SE	β	B	SE	β	B	SE	β
Intercept	0.09	(0.01)		0.09	(0.01)		0.09	(0.01)	
University[a]	-0.11**	(0.02)	-0.38	-0.09**	(0.02)	-0.33	-0.05**	(0.02)	-0.19
Gender[b]	0.05*	(0.02)	0.15	0.05*	(0.02)	0.15	0.04†	(0.02)	0.10
Year of studies	-0.01	(0.01)	-0.05	-0.01	(0.01)	-0.07	-0.01	(0.01)	-0.04
Business ownership (T1)	-0.02	(0.03)	-0.05	-0.03	(0.02)	-0.06	-0.04	(0.03)	-0.10
Variability in entrepreneurial self-efficacy (W1-W12)				-0.16**	(0.04)	-0.23	-0.09*	(0.04)	-0.12
Average in entrepreneurial self-efficacy (W1-W12)							0.10**	(0.02)	0.35
Variability × Average in entrepreneurial self-efficacy (W1-W12)							-0.33**	(0.09)	-0.21
F		9.87			11.12			15.43	
R^2		.14			.19			.32	

Note. [a] 0 = Tanzania, 1 = Rwanda; [b] 0 = female, 1 = male; † $p < .10$, * $p < .05$, ** $p < .01$.
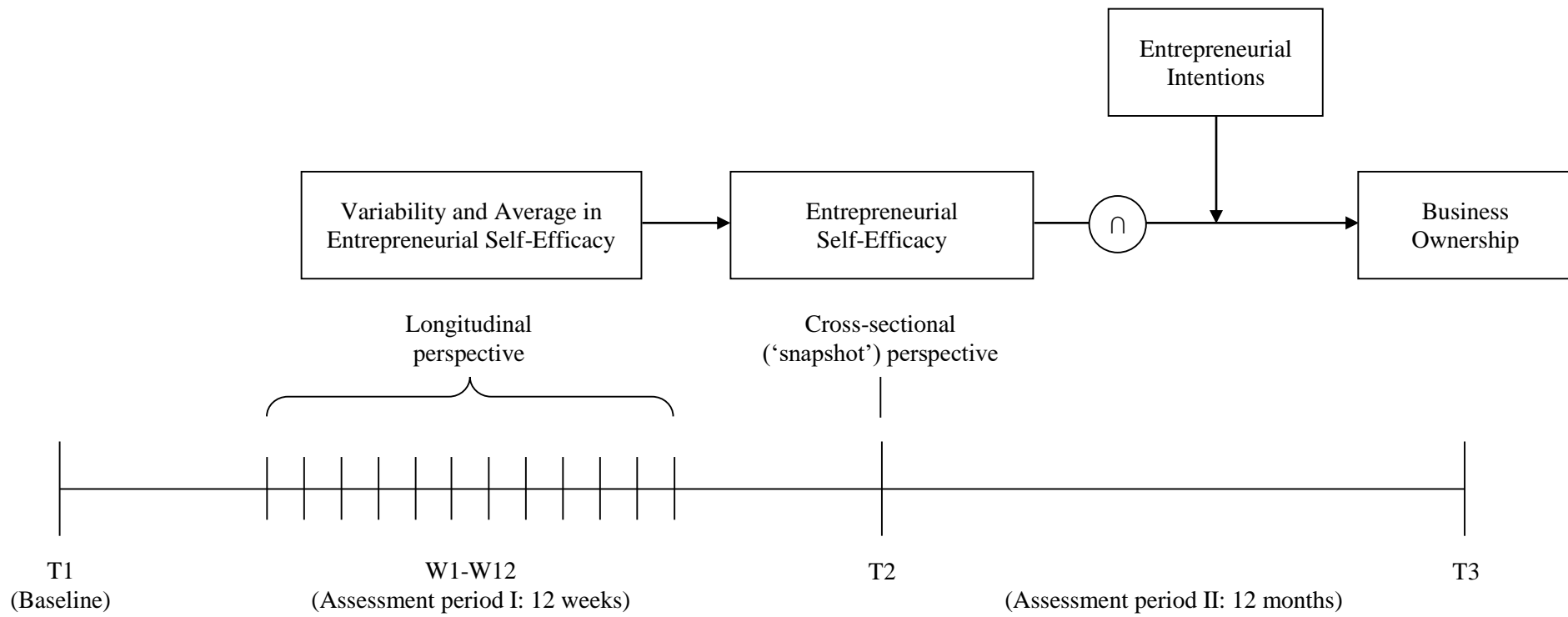
Figure 1. A dynamic account of entrepreneurial self-efficacy illustrated along the assessment periods of the study

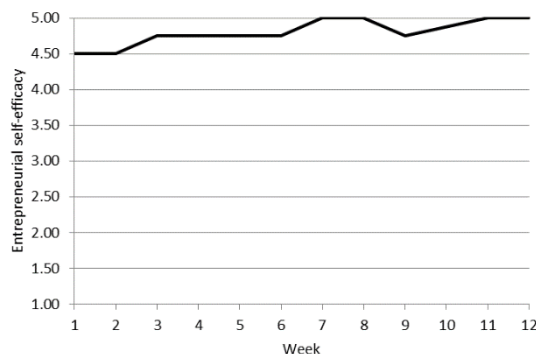ENTREPRENEURIAL SELF-EFFICACY

Panel A: High variability   Panel B: Low variability

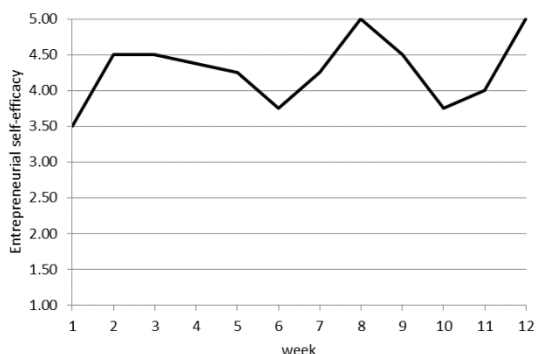High average in entrepreneurial self-efficacy
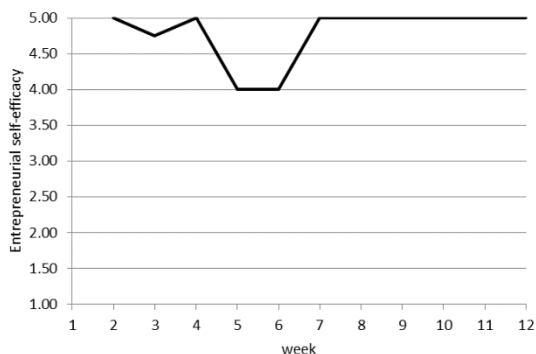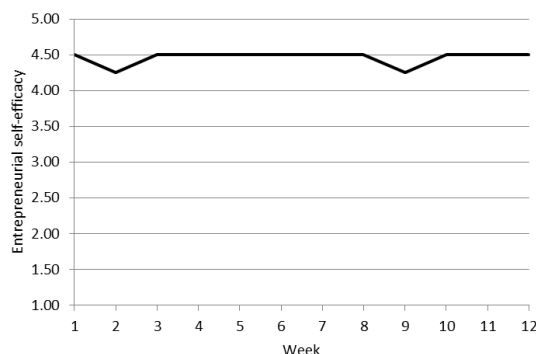

Participant A: M =4.72 ; SD = 0.45   Participant B: M = 4.80; SD = 0.19
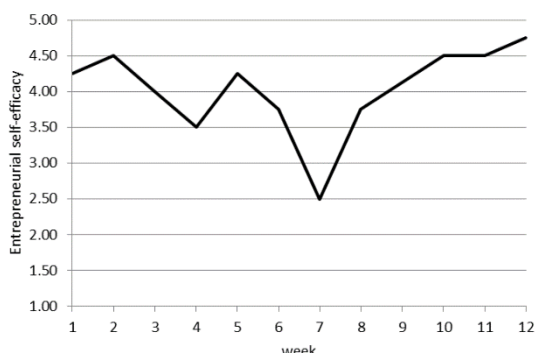
Medium average in entrepreneurial self-efficacy
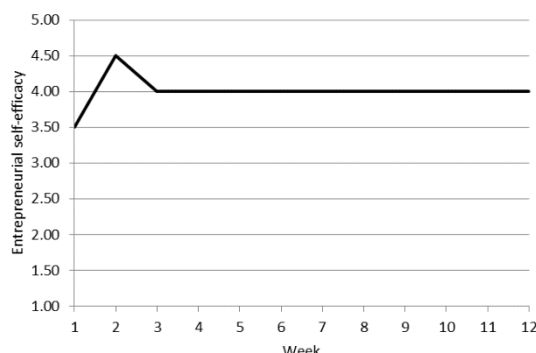

Participant C: M = 4.27; SD = 0.49   Participant D: M = 4.46; SD = 0.10

Low average in entrepreneurial self-efficacy

Participant E: M = 4.02; SD = 0.64   Participant F: M = 4.00; SD = 0.24

Figure 2. Individual trajectories over the 12 weeks of assessment period I depicting participants'
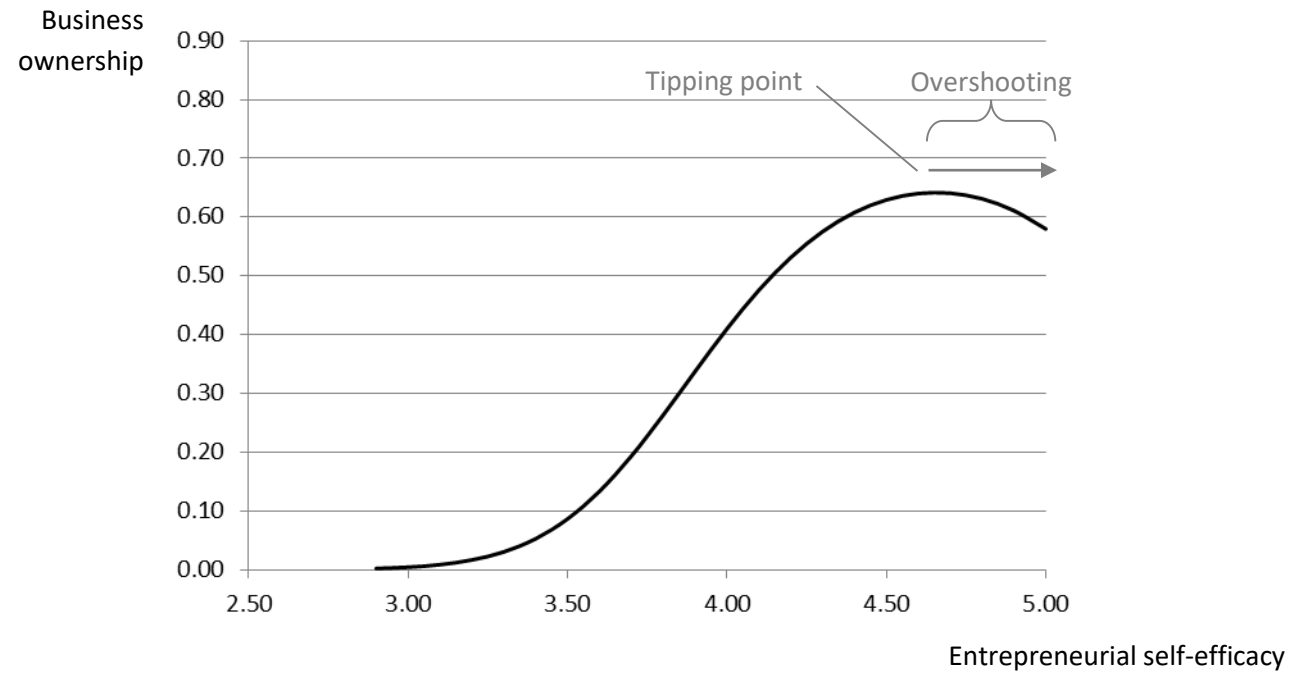
variability in entrepreneurial self-efficacy

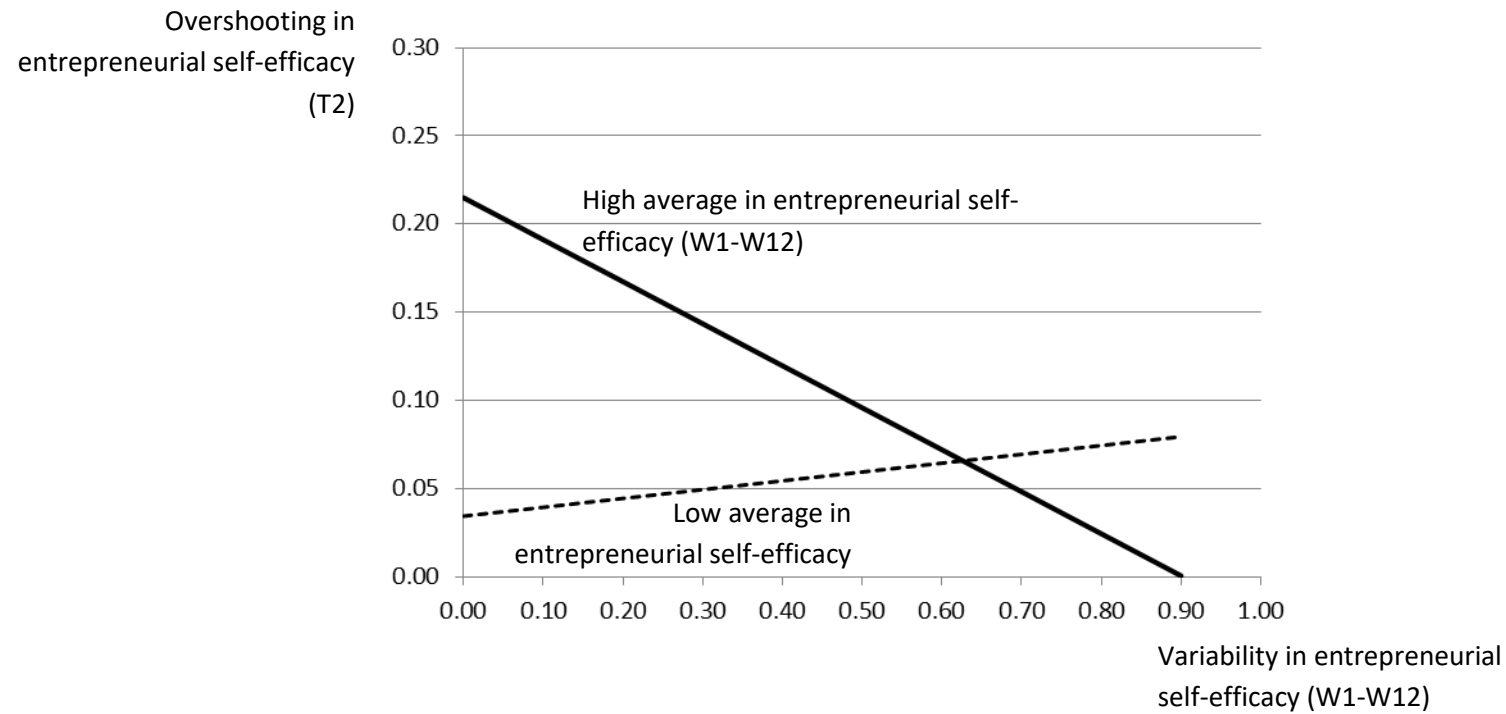**Figure 3.** The curvilinear effect of entrepreneurial self-efficacy on business ownership

Figure 4. The effect of variability in entrepreneurial self-efficacy on overshooting in entrepreneurial self-efficacy contingent on average in
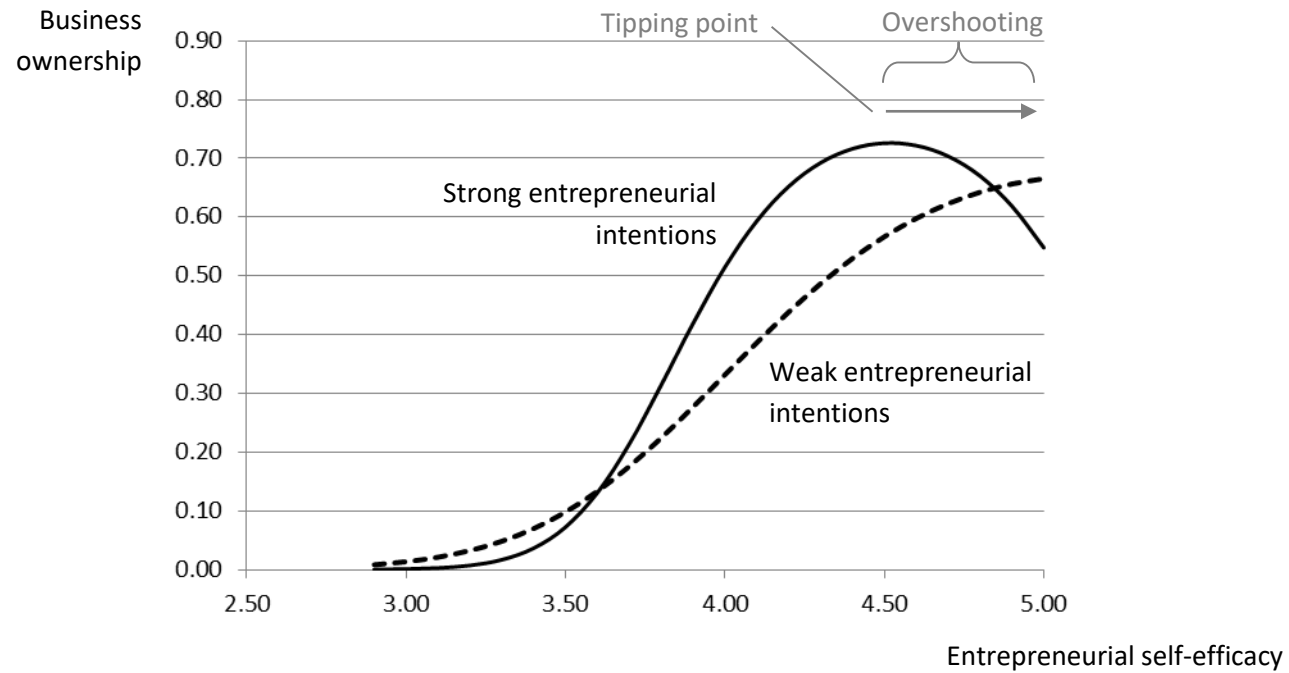
entrepreneurial self-efficacy

Figure 5. Entrepreneurial intentions as a boundary condition for the inverted u-shaped relationship between entrepreneurial self-efficacy and

business ownership