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Entrepreneurial fear of failure: Scale development and validation

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ABSTRACT

Fear of failure is an important part of the experience of entrepreneurship. Yet past research has mainly investigated fear of failure in entrepreneurship among non entrepreneurs or nascent entrepreneurs and has done so by asking for reactions to hypothetical future failure. This approach to operationalizing the construct limits our capacity for understanding how entrepreneurs actually experience fear of failure while practicing entrepreneurship. In this paper, we conceptualize entrepreneurial fear of failure as a negative affective reaction based in cognitive appraisals of the potential for failure in the uncertain and ambiguous context of entrepreneurship. We use multiple samples to develop and validate a multidimensional, formative measure to assess entrepreneurial fear of failure as a state that is both cognitive and affective in nature. In addition to evidence of the psychometric properties of the new scale across multiple studies, we present a nomological network analysis with respect to measures of theoretically derived psychological outcomes and perceived behavioral tendencies of entrepreneurial fear of failure. We then discuss the theoretical, methodological, and empirical implications of this new measure of entrepreneurial fear of failure with an eye towards use of this scale in future research.

Executive summary

Prior research on fear of failure in entrepreneurship has portrayed this construct as a stable motive disposition that leads people to avoid starting a venture. Other research has treated fear of failure as a negative emotional state that leads entrepreneurs to have less-positive views about opportunities. Much of the prior research investigates fear of failure in a hypothetical performative context, where participants, often non-entrepreneurs or nascent entrepreneurs, are asked to imagine how they might respond when they are failing. However, such an approach does not capture the concrete, real-life experience of individuals who are currently undertaking actions within the actual performative context of entrepreneurship, where the necessary tasks, evaluation criteria, and competencies required are ambiguous and uncertain. Thus, while prior research has made progress in identifying the role of fear of failure in entrepreneurship, it has not sufficiently conceptualized *entrepreneurial* fear of failure as a construct that emerges from the experience of practicing entrepreneurs, as well as aspiring ones, within the ambiguous and uncertain performative context of entrepreneurship.

We seek to address this gap with this research by providing a conceptual understanding of entrepreneurial fear of failure with respect to entrepreneurs' experience within the actual performative context of entrepreneurship. In doing so, we define entrepreneurial fear of failure as *a negative affective reaction based in cognitive appraisals of the potential for failure in the uncertain and*

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ambiguous context of entrepreneurship. We develop and validate a new measure to assess entrepreneurial fear of failure. To do so, we take, as a starting point, the qualitative study by Cacciotti et al. (2016) on the experience of fear of failure and develop an initial pool of items based on their research. We then engage 211 potential and active entrepreneurs in a pilot study to reduce the number of items and assess their dimensionality and internal consistency. Next, we conduct three separate studies with a total of 423 participants to cross-validate the new measure and provide evidence of convergent, discriminant, and criterion-related validity of the construct.

We seek to make three types of contribution: theoretical, methodological, and empirical. We contribute theoretically by providing a new conceptualization of entrepreneurial fear of failure that is evoked by experience within the actual performative context of entrepreneurship. In this conceptualization, fear of failure is a multidimensional and formative state that is cognitive and affective in nature. We contribute methodologically by developing and validating a six-dimension measure for future research in entrepreneurship. This new measure complements existing measures of fear of failure and also overcomes the theoretical and operational limitations of these measures. We contribute empirically by demonstrating the multidimensional nature of entrepreneurial fear of failure and by showing that fear of failure in entrepreneurship is not stable over time and that it may also differentially affect psychological outcomes and perceived behavioral tendencies. We conclude by discussing how our work changes the landscape of fear of failure research in entrepreneurship.

1. Introduction

I was confident enough to move forward with my idea, but I hadn't totally eliminated my fear of failure. Instead, I used that fear to fuel my effort. – Jeffrey Weber, From Idea to Exit.

As the above quotation illustrates, fear of failure is an inherent part of the experience of entrepreneurship (e.g., Cacciotti and Hayton, 2015; Cacciotti et al., 2016; Mitchell and Shepherd, 2010, 2011; Weber, 2012). In their attempts to start and develop new ventures, entrepreneurs face the fear and excitement of dealing with an array of tasks that may or may not result in failure, including launching new products and services, working to obtain funding, laboring to develop and maintain relationships with valued customers, striving to achieve the margins required for economic sustainability, and so on (Baron et al., 2013; Cacciotti and Hayton, 2015). In recent years, there has been increase in research interested in understanding the role of fear of failure in entrepreneurship (Arenius and Minniti, 2005; Cacciotti and Hayton, 2015; Langowitz and Minniti, 2007; Minniti and Nardone, 2007; Mitchell and Shepherd, 2010; Wood et al., 2014). Some scholars have defined fear of failure as a stable motive disposition that leads people to avoid starting a venture (e.g., Arenius and Minniti, 2005; Minniti and Nardone, 2007). Others have treated it as a negative emotional state that leads entrepreneurs to have a less positive view about opportunities (e.g., Li, 2011; Welpe et al., 2012) and still others have sought to examine fear of failure as it is experienced by entrepreneurs (see e.g., Cacciotti et al., 2016; Mitchell and Shepherd, 2011).

In these various approaches to fear of failure, a number of different assumptions have been applied. For instance, past research has often approached fear of failure from the perspective of a *hypothetical* performative context where individuals are asked to imagine or reflect on how they feel when they are failing (see Mitchell and Shepherd, 2010; Wood et al., 2014). These approaches to measuring the hypothetical experience do not capture the actual experience of the entrepreneur within the real performative context of entrepreneurship and cannot measure if fear of failure is actually experienced. Asking how one might react is not the same as asking what one's experience has been. Second, prior work has assumed that measures designed for substantively different contexts, such as education and sports, may translate effectively to the entrepreneurial context (e.g., Conroy and Elliot, 2004; Martin and Marsh, 2003). These contexts involves tasks, evaluation criteria, and competencies that are unambiguous and evident, which are quite different from the ambiguous, dynamic, multifaceted and uncertain performative context of entrepreneurship (Morris et al., 2012). Third, many prior studies have assumed that fear of failure applies only to aspiring or very early stage entrepreneurs, and that it only inhibits entrepreneurial behavior (e.g., Arenius and Minniti, 2005; Minniti and Nardone, 2007). Yet, practicing entrepreneurs may experience fear of failure at any stage of the venture lifecycle, with consequences which may extend beyond inhibition of entrepreneurial activity. For these reasons, a significant gap exists in the entrepreneurship literature with respect to understanding the fear of failure that emerges from experience within the actual and specific performative context of entrepreneurship.

Accordingly, in this paper, we take an important initial step towards filling this gap by providing a new understanding of the concept of *entrepreneurial* fear of failure that avoids some of the challenges faced by prior research (see e.g., Mitchell and Shepherd, 2010; Wood et al., 2014). Building on the experience-based perspective of entrepreneurship as an ambiguous and uncertain performative context (Atkinson, 1957; Davis et al., 2009; Morris et al., 2012) and recent entrepreneurship research on fear of failure (Cacciotti et al., 2016), we conceptualize entrepreneurial fear of failure as a state that is cognitive and affective in nature (e.g., Lazarus, 1991; Ortony et al., 1988; Scherer et al., 2001). We then develop and validate a multidimensional and formative measure of the experience of entrepreneurial fear of failure (Davis et al., 2009; Morris et al., 2012), consisting of reflective first-order dimensions that combine in a formative second-order construct (Law et al., 1998).

We make three important contributions. First, we contribute theoretically by providing a new conceptualization of entrepreneurial fear of failure as being evoked by experience within the performative context of entrepreneurship. In doing so, we elaborate a multidimensional model that better reflects the full range of sources of fear of failure which entrepreneurs experience (Cacciotti et al., 2016). Second, we contribute methodologically by developing and validating a scale for future research in entrepreneurship that complements existing measures of fear of failure, while also overcoming the theoretical and operational limitations of these measures. Third, we contribute empirically by demonstrating the multidimensional nature of entrepreneurial fear of failure and providing evidence that fear of failure in entrepreneurship is not stable over time and that it may also differentially affect

psychological outcomes and perceived behavioral tendencies.

2. Conceptualizing entrepreneurial fear of failure

2.1. Fear of failure, the performative context, and the experience of entrepreneurship

In past psychological research, fear of failure has often been studied as a determinant of the behavior(s) people display in performative contexts such as sports and education (e.g., Conroy and Elliot, 2004; Martin and Marsh, 2003). Drawing on the appraisal theory of emotion (Lazarus, 1991), Conroy (2001) defined fear of failure as an emotional reaction emerging from the cognitive appraisal of experiences that represent a threat to one's ability to accomplish a personally meaningful goal. According to appraisal theory, such threat appraisals encompass the cognitive anticipation of the aversive consequences of failing and affective feelings such as anxiety associated with fear of failure (Lazarus, 1991; Conroy, 2001).

While individuals' cognitive appraisals are influenced by enduring factors such as motive dispositions and past experience (Lazarus, 1991), they are also a function of the performative context in which new experiences unfold. Performative contexts can be characterized by: (1) the necessary task(s) to be performed; (2) the criteria against which the performance will be evaluated; and (3) the competencies required to carry out the task(s) according to established criteria (Atkinson, 1957; Maehr and Sjogren, 1971). Schema for success and failure in a given context involve knowledge of the necessary tasks, evaluation criteria, and competencies required (Atkinson, 1957). When information about these three elements is well-defined and evident, such as in the contexts of sports and education, it becomes easier for individuals to elaborate the meaning of failure and understand its aversive consequences (Conroy et al., 2001). In the performative context of entrepreneurship, however, ambiguity and uncertainty are defining characteristics (Cacciotti and Hayton, 2015; Morris et al., 2012; Townsend et al., 2018) and it is therefore more difficult to understand the necessary tasks, evaluation criteria, and competencies required to avoid failure and its aversive consequences.

The absence of "interpretive frames" (Townsend et al., 2018: 667) causes ambiguity that leads to difficulties in understanding the necessary tasks (e.g., organizing, recruiting, networking, selling, financing, distributing, etc.) and how these tasks should be performed (Davis et al., 2009; Morris et al., 2012). Likewise, uncertainty about external conditions and outcomes (Bird, 1989; Townsend et al., 2018) makes it difficult to predict how different stakeholders will evaluate entrepreneurial performance (e.g., customer reactions to a certain price, responses from competitors and investors, etc.). In combination, ambiguity and uncertainty make it hard for an entrepreneur to accurately evaluate whether she or he has the necessary competencies to succeed in the performative context of entrepreneurship (Milliken, 1987; Davis et al., 2009). In such a context, where the information about necessary tasks, evaluation criteria, and competencies is ill-defined, difficult to interpret and potentially indeterminate (Shepherd et al., 2009; Ucbasaran et al., 2013), failure is not simply seen or experienced as an all or nothing outcome but begins to be understood in terms of small failures in dealing with obstacles, demands, unclear responsibilities, diverse tasks, and decisions that have implications for the entrepreneur, the venture, and its stakeholders (Cacciotti and Hayton, 2015; Schindehutte et al., 2006). Each small failure can represent a signal with respect to fears of the unknown (Ellsberg, 1961), fear of the potential for social rejection (e.g. Asch, 1956; Berns et al., 2005) and ultimately fears related to individual identity as a failure in the role of entrepreneur (Sandage, 2009). In such a performative context, fear is evoked by the cognitive appraisal of the potential for failure in dealing with the reality of entrepreneurship.

Because entrepreneurial fear of failure emerges as the experience of entrepreneurship unfolds (Barnett, 2006), we argue that it should not be simply defined in terms of static associations of venture failure with its aversive consequences (Conroy and Elliot, 2004) but rather in terms of the dynamic experience within the performative context of entrepreneurship, where the interpretation of failure emerges vis-à-vis the experience of entrepreneurship (Morris et al., 2012). Building on prior research into fear of failure as experienced by entrepreneurs (Cacciotti et al., 2016), we delineate in the following section the conceptual space of entrepreneurial fear of failure as it is experienced in the performative context of entrepreneurship.

2.2. Entrepreneurial fear of failure

In their work on entrepreneurial fear of failure, Cacciotti et al. (2016) adopted an inductive approach (Miles and Huberman, 1994) to examine the concept by asking individuals who were starting or already running a venture to report their subjective experience of fear of failure. They described fear of failure as a multidimensional construct, generalized into seven different themes or dimensions: 1) fear about loss or the potential for loss of the entrepreneur's livelihood and stored wealth if the venture fails; 2) fear about the (in)ability to perform actions or tasks associated with the pursuit of an opportunity or idea, and/or the development of the venture; 3) fear about the (in)ability to generate or attract the necessary financial capital for the venture; 4) fear about the true potential of the opportunity or idea on which the venture is based; 5) fear about how others might perceive the entrepreneur should she or he take a misstep or fail entirely; 6) fear about the venture team or organization's (in)ability to carry out the tasks needed for success; and 7) fear about the opportunity costs associated with dedicating time and resources to developing a venture that might fail. The nature of these dimensions confirms that entrepreneurial fear of failure, as previously noted, should not be articulated solely in terms of the fear that the business venture may collapse. It leads us to suggest that entrepreneurial fear of failure should be conceptualized in terms of the possibility of failing in the tasks and responsibilities surrounding a specific entrepreneurial activity (e.g., funding, pitching, networking, recruiting, etc.) in the ambiguous and uncertain performative context of entrepreneurship. These tasks each have consequences for the future survival of the venture, and are reported by entrepreneurs as a source of their fears of failure (Cacciotti et al., 2016).

In making this observation, and in building towards a definition, we also add that not all dimensions of entrepreneurial fear of

failure have to be part of an individual's experience within the performative context of entrepreneurship for that individual to experience fear of failure. We thus make the case for conceptualizing entrepreneurial fear of failure as an aggregate second-order formative latent construct (Law et al., 1998). In such a conceptualization, the various dimensions operate as (a) independent and (b) compensatory components to form the latent construct of entrepreneurial fear of failure (Bagozzi and Edwards, 1998; Law et al., 1998). Because the different dimensions of fear of failure are proposed to be independent, each can be separately assessed and they are not expected to relate to each other in a consistent manner. Independence of the dimensions also implies that they can potentially work in discordant ways when producing the latent construct. Because the dimensions are compensatory in forming the construct of entrepreneurial fear of failure, a high value in one dimension can compensate for a low value in another dimension.

Furthermore, as Cacciotti et al. (2016: 314) articulated, entrepreneurial fear of failure “varies with time and experience.” Thus, in our conceptualization, we also suggest that fear of failure within the performative context of entrepreneurship is not expected to remain stable as the experience of entrepreneurship unfolds (Morris et al., 2012). As Lazarus (1991: 47) noted, “emotion states and traits are two sides of the same coin; when stability is high, the focus is on trait and state recedes in importance; when instability is high the focus is on state and trait recedes in importance.” Therefore, while fear of failure can have a stable, trait-based aspect (Conroy, 2001; Elliot, 2006), we propose that fear of failure resulting from experience within the ambiguous and uncertain performative context of entrepreneurship should be conceptualized as a state variable, with a measurement approach that captures its potentially dynamic aspects, and its time-bounded nature.

Accordingly, we define entrepreneurial fear of failure as *a negative affective reaction based in cognitive appraisals of the potential for failure in the uncertain and ambiguous performative context of entrepreneurship*. This definition separates the negative emotional reaction of fear of failure from the perceived behavioral tendencies that can result from it (as is alluded to in the introductory quotation) and thereby also allows for the potential that fear of failure may motivate as well as inhibit behavior. So defined, entrepreneurial fear of failure requires a measurement approach that is multidimensional and formative in nature, which addresses the facets of the entrepreneurial experience understood to give rise to fear (Cacciotti et al., 2016), and which can reflect this combined cognitive and affective concept as a state rather than assuming it is a stable trait. By developing a measure that captures the cognitive components (that reflect the meaning of failure) and the affective components (that reflect the feeling of fear) of entrepreneurial fear of failure, we can then separate these components from the perceived behavioral tendencies (that reflect behavioral approach and avoidance outcomes [Cacciotti et al., 2016]) that result (Barnett, 2006). In the following section, we discuss in more depth prior ways of measuring entrepreneurial fear of failure as a precursor to explaining how we measure fear of failure consistent with our definition.

3. Measuring entrepreneurial fear of failure

We searched the existing entrepreneurship research literature to identify the measures that have been used to empirically assess fear of failure in entrepreneurship. In our search, we followed the approach of Cacciotti and Hayton (2015), but extended their work by including papers published between 2015 and 2019. Our search resulted in a total of 75 empirical articles. We coded the measures used by considering the theoretical framework(s) within which they are applied to define the nature of fear of failure (e.g., stable motive disposition, negative emotional state, behavioral tendency) and their psychometric properties (e.g., dimensionality). Table 1 contains a summary of our results.

In evaluating Table 1, we note that some of these measures capture the dispositional nature of fear of failure (e.g., achievement motivation scale) and assume a unidimensional and unidirectional avoidance-based behavioral outcome (e.g., GEM item). Other measures capture fear of failure by assessing negative affect or the negative emotion of fear (e.g., the PANAS-X and emotion lists) and do not include the associated cognitive appraisal processes that are an inherent part of the emotional experience (Lazarus, 1991). We note that one measure developed for use in sport psychology research, the Performance Failure Appraisal Inventory (PFAI) (Conroy et al., 2002, 2003a, 2003b), has been used in entrepreneurship research to capture the multidimensional nature of fear of failure (e.g., Mitchell and Shepherd, 2010; Ng and Jenkins, 2018; Wood et al., 2014). This measure assesses individuals' beliefs about the aversive consequences of failing and/or not succeeding along five dimensions: 1) experiencing shame and embarrassment; 2) devaluing one's self-estimate; 3) having an uncertain future; 4) important others losing interest; and 5) upsetting important others (Conroy and Elliot, 2004). While the PFAI is consistent with a conceptualization of fear of failure as a multidimensional construct, it does not fully capture fear of failure in the experience of entrepreneurship, as we now describe.

The first reason that the PFAI does not fully capture entrepreneurial fear of failure is that only some of the dimensions of the construct conceptually correspond to what is experienced within the performative context of entrepreneurship (Cacciotti et al., 2016). While the overlap of the PFAI dimensions with recent entrepreneurship research adds validity to our new conceptualization of entrepreneurial fear of failure, the lack of correspondence of the remaining fears to the performative context of entrepreneurship demonstrates the need for a new measure to capture entrepreneurial fear of failure. A second reason that the PFAI does not fully capture entrepreneurial fear of failure is its focus on fear of failure as a stable construct. That is, when asking about individuals' fears, the PFAI introduces a stem: “when I am failing” followed by a statement reflecting a belief or behavior (e.g., “I am less valuable than when I succeed” or “my future seems uncertain”). This requires that the individuals imagine that they are failing and then reflect on this hypothetical performative context in order to provide an answer. Such an approach may be able to capture fear of failure as a stable motive disposition, but it is not suitable for capturing fear of failure in the dynamic, ambiguous, and uncertain context of entrepreneurship in which information about the necessary tasks, evaluation criteria, and competencies required are ill-defined, difficult to interpret, and potentially indeterminate.

A third reason that the PFAI does not fully capture entrepreneurial fear of failure is because it does not fully measure the cognitive and affective elements of fear of failure. Specifically, the items in the PFAI are primarily designed to assess beliefs about the aversive

Table 1
Description of measures of fear of failure used in entrepreneurship research.

Measures	Theoretical framework	Nature of fear of failure	Psychometric properties	Sample citation
GEM item (Reynolds et al., 2005)	Achievement motivation theory (McClelland, 1961)	Behavioral tendency (avoidance)	Single-item	Shahriar and Shepherd, 2019
Achievement Motives Scale (Gjesme and Nygard, 1970; Lang and Fries, 2006)	Achievement motivation theory (McClelland, 1961)	Stable motive disposition	Unidimensional	Kollmann et al., 2017
Herman's fear of failure scale (Elliot and Church, 1997)	Achievement motivation theory (McClelland, 1961)	Behavioral tendency (avoidance)	Unidimensional	Stroe et al., 2020
Positive and negative affect scale on fear (PANAS-X) (Watson and Clark, 1994)	Affect-as-information theory (Clore et al., 2001)	Negative emotional state	Unidimensional	Weipe et al., 2012
Emotion Lists (fear) (Bosman and Winden, 2002)	Appraisal theory of emotion (Lazarus, 1991)	Negative emotional state	Single-item	Li, 2011
Performance failure appraisal inventory (PFAI) (Conroy et al., 2002, 2003a, 2003b)	Appraisal theory of emotion (Lazarus, 1991)	Stable motive disposition	Multi-dimensional	Ng and Jenkins, 2018

consequences of failure (e.g., “I believe that important others are disappointed”), and only occasionally reference the presence of an affective state (e.g., “I am afraid that I might not have enough talent”). However, within appraisal theory, cognitive evaluations are seen as not only the causes of an emotion but also as an integral feature of the emotional reaction itself (Roseman and Smith, 2001). So, although we agree that cognitive beliefs can evoke the affective elements of fear of failure, we also want to overcome the criticism of the appraisal theory of emotion that questions whether cognitive evaluations always imply affective reactions (see e.g., Roseman and Smith, 2001). Because emotions are responsible for activating behavior, as they represent the feedback device (Clare et al., 2001), assessing their presence is extremely important for understanding the consequences of fear of failure. Moreover, we view the appraisal process not simply as an antecedent of the emotional reaction but also as an integral component of the emotion (see e.g., Ellsworth and Scherer, 2003; Lazarus, 1991). Thus, while the PFAI has been helpful for understanding fear of failure in entrepreneurship, we suggest that a measure is needed that can more fully capture both the cognitive and affective aspects of fear of failure (see e.g., Ellsworth, 1991). As previously noted, we have suggested the need for a measure of entrepreneurial fear of failure that is multidimensional and formative in nature and that captures the state aspect of this cognitive and affective concept. It is to the development of such a measure that we now turn.

4. Scale development

Building on prior psychometric research (e.g., Nunnally and Bernstein, 1994; Hinkin, 1998) and recent scale development exemplars (Cardon et al., 2013; Scheaf et al., 2020), we conducted a three-stage procedure to develop and validate an instrument to assess entrepreneurial fear of failure. First, we adopted an inductive approach to generate a pool of items and test their content validity. Second, we conducted a pilot study to reduce the number of items and assess their dimensionality and internal consistency. Third, we conducted three separate studies to cross-validate the new measure and provide evidence of the convergent, discriminant, and criterion-related validity of the construct. Table 2 presents a summary of the studies.

4.1. Measurement strategy and item development

We used an inductive approach to develop an initial pool of items (Hinkin, 1998) based on the qualitative study by Cacciotti et al. (2016). Their study involved 65 semi-structured interviews with active and potential entrepreneurs in the United Kingdom and Canada. These individuals—active entrepreneurs, nascent entrepreneurs, or individuals who had an entrepreneurial idea that they pursued and then dropped—were identified and recruited through regional entrepreneurship support organizations.

To be consistent with the multidimensional model of entrepreneurial fear of failure, we formulated items around the seven entrepreneurial dimensions described above, as follows: 1) financial security; 2) personal ability; 3) ability to fund the venture; 4) potential of the idea; 5) threat to social esteem; 6) the venture's capacity to execute; and 7) opportunity costs. To develop the items, we analyzed the semi-structured interviews to ensure that the content of the items reflects the concept of fear of failure in the performative context of entrepreneurship. The individual personal accounts of the experience of entrepreneurial fear of failure were coded into seven categories that represented the dimensions. From these, we derived generic statements that described the construct we are trying to measure (DeVellis, 2016). For example, the following quote was coded under the financial security category:

“The main fear was that the security I had working for this company was no longer there. I was going to be running the company, which is a different kettle of fish. So, I was no longer working with a secure wage but running the company and making the changes I needed to make it a success” (Cacciotti et al., 2016: 310).

This was synthesized as: “fear of running out of money.” Similarly, the following quote was coded under the personal ability category:

“There was anxiety in terms of how I was going to be able to create the programming, there was a bit of anxiety there” (Cacciotti et al., 2016: 310).

This was synthesized as “fear of not having the right skill sets to build the product/service.” The drafted statements were shared among the research team for initial editing of content (DeVellis, 2003).

Building on the conceptualization that entrepreneurial fear of failure emerges from the experience of entrepreneurship, we formulated the items in a way that reflected both the cognitive and the affective components of the concept as well as its state aspect. First, we made sure that items explicitly referenced the experience of an affective state linked to the cognitive interpretation of the meanings of venture failure. This had also been very clear in the interviews where individuals, when describing the experience of fear of failure, used expressions such as “I have been afraid,” “I have worried,” or “I have felt anxious.” We opted for the “I have been afraid” type of format so as to be consistent with the intended focus of the measure.¹

¹ The psychology literature assumes that the terms fear, anxiety, and worry have a common core of shared meaning (e.g., the appraisal of uncertain and existential threats) and can be used with no distinction across individuals and contexts (Lazarus, 1991). However, in order to be confident in our framing, we used MTurk to test the assumption of shared meaning of terms and asked individuals from the general population (n = 160) to complete a questionnaire with a short list of selected items, with each item paired using the following combinations: anxiety/afraid worry/afraid and anxiety/worry. A paired-samples *t*-test was conducted to compare the level of entrepreneurial fear of failure in the “anxiety” and “afraid” conditions, “worry” and “afraid” conditions, and “anxiety” and “worry” conditions. There was no significant difference in the scores for “anxiety” (M = 2.18, SD = 1.06) and “afraid” (M = 2.21, SD = 1.08) conditions; $t(159) = -0.62, p = .54$. Similarly, there was no significant

Table 2
Summary of research program.

Sample number	Description	N	Development and validity assessment	Key findings
Item development	Active and potential entrepreneurs	<ul style="list-style-type: none"> • N = 65 • Age: M = 35.5 years • Male 73% 	<ul style="list-style-type: none"> • Item development • Refinement of item pool by experts 	<ul style="list-style-type: none"> • 49 items (7 per dimension)
Pilot study	Post graduate students ^a	<ul style="list-style-type: none"> • N = 211 • (response rate = 79.6%) • Age: M = 30 years, SD = 1.2 • 67% male • 22% full time entrepreneur • 24% part time entrepreneurs 	<ul style="list-style-type: none"> • Initial item evaluation • Refine item pool 	<ul style="list-style-type: none"> • Six-factor structure emerged based on exploratory factor analysis • 21 items retained that accounted for 68% of the variance
1	Post graduate students ^a	<ul style="list-style-type: none"> • N = 142 (response rate = 48.7%) • Age: M = 25 years, SD = 1 • 59% male • 16% full time entrepreneur • 22% part time entrepreneurs 	<ul style="list-style-type: none"> • Factor structure • Convergent validity • Discriminant validity 	<ul style="list-style-type: none"> • Six -factor structure is confirmed with a new sample • EFF dimensions are internally consistent • EFF is a formative construct • EFF dimensions converge with measures of similar constructs • EFF dimensions diverge from measures of distinct but related constructs
2	Active entrepreneurs ^b	<ul style="list-style-type: none"> • N = 110 (response rate = 44%) • Age = 37 years, SD = 1 • 71% male • 40% previous start-up experience 	<ul style="list-style-type: none"> • Factor structure • Criterion-related validity 	<ul style="list-style-type: none"> • Six-factor structure is replicated with a new sample • EFF dimensions significantly influence psychological and subjective well-being above and beyond a stable trait (e.g., neuroticism)
3	Active entrepreneurs ^c	<ul style="list-style-type: none"> • N = 105 (response rate = 61.4%) • Age: M = 50 years, SD = 13.6 • 51% male • 24% previous start-up experience 	<ul style="list-style-type: none"> • Temporal dynamism • Criterion-related validity 	<ul style="list-style-type: none"> • Within person EFF scores are not stable over time, consistent with a state perspective on EFF • EFF dimensions significantly influence perceived behavioral tendencies such as personal initiative and persistence

Note. EFF = Entrepreneurial fear of failure.

^a All postgraduate students expressed a preference for entrepreneurship and attended an entrepreneurship course.

^b 11.8% of the participants are self-employed.

^c 90.1% of the participants are self-employed.

Second, it was necessary to ensure that items in the measure reflected the state aspect of entrepreneurial fear of failure. Accordingly, we added to each item a declarative statement stem that expressed a limited time perspective: “Over the past few months” (DeVellis, 2003). Our theoretical rationale for using this specific time frame was derived from the nature of entrepreneurial activities (e.g., opportunity development, funding, networking, etc.) and the likelihood that these are not necessarily quickly accomplished in the temporal structure of the experience of entrepreneurship (Cope and Watts, 2000; Morris et al., 2012). Empirical support for this decision is found in evidence that subjects’ life events during the prior three month period are significantly associated with affect and subjective well being, while more distant events are not significantly associated (Suh et al., 1996).

This process resulted in the articulation of 93 items that were written as declarative sentences, followed by response options that indicated the varying degrees of agreement or disagreement with the statement on a 5-point scale. This formulation is generally used to capture feelings or opinions about individual experiences and provides the opportunity for gradations (DeVellis, 2003) so that it is possible to capture the theorized compensatory nature of the dimensions. Following the procedure developed by Hinkin (1998), the four co-authors and a group of experts in entrepreneurship (two additional scholars and one practitioner) reviewed the items and rated the degree of each item’s relevance to a working definition of each dimension of entrepreneurial fear of failure. We invited the experts to comment on individual items and evaluate the clarity and conciseness of each item. We ranked items based on the scores given by the experts, which resulted in a list of the 49 most relevant items (seven per dimension; see Table 3). We retained some redundancy in the final item pool as an integral part of internal consistency (DeVellis, 2003).

5. Pilot study: Item reduction

5.1. Pilot study method

Participants were 211 potential and active entrepreneurs selected from postgraduate courses in entrepreneurship at one university in the United Kingdom (132), one university in the United States (20), and one university in Chile (59). Surveys were emailed to potential participants. The email included a cover letter explaining the purpose of the study, instructions, and a link for the online survey’s completion. In the instructions, we explicitly asked potential participants to complete the survey only if they: (1) were active entrepreneurs; (2) had been thinking about a new entrepreneurial idea but had not yet started; or (3) had been thinking about a venture in the past few months but had chosen not to start. In return for their participation we offered the opportunity to enter a prize draw with 3 × £50 and 4 × £40 Amazon Gift Vouchers.

5.2. Results

5.2.1. Exploratory factor analysis

The initial measure of entrepreneurial fear of failure was first subjected to exploratory factor analysis (EFA) using principal-component analysis with oblique rotation. Results from parallel analysis (Hayton et al., 2004) recommended retaining six factors. Because participant-per-item ratio was between 3:1 and 5:1, we checked for item communalities and factorability of the dataset to determine the adequacy of sample size. The dataset contains communalities higher than 0.50, and the Kaiser-Meyer-Olkin (KMO) measure of sampling adequacy of 0.89 is above the suggested threshold of 0.70 (Tabachnick and Fidell, 2001). The Bartlett’s test of sphericity resulted in rejection of the null hypothesis that the correlation matrix is an identity matrix ($p < .05$), and provided further evidence for scale factorability (Tabachnick and Fidell, 2001). Taking into account the high communalities for the items, and the overdetermination of the factors (high item to factor ratio), the sample size of 211 is adequate according to MacCallum et al. (1999). Accordingly, we proceeded with principal component analysis,² imposing an extraction of six factors as suggested by our parallel analysis.

The six-factor solution accounted for approximately 54% of the variance in the items. We used a combination of item communalities after rotation (< 0.40), low items loadings (< 0.32), and cross-loadings on the factors (< 0.15 difference from an item’s highest factor loading and absolute loadings higher than 0.32 on two or more factors) as deletion or retention criteria (Worthington and Whittaker, 2006; Tabachnick and Fidell, 2001). This process reduced the 49 items to 39 items. To further optimize the length of the measure, we deleted items based on the lowest factor loadings, cross-loadings, and low conceptual consistency with other items on the factor, without compromising the internal consistency of the dimensions. To ensure that item elimination did not result in changes to factor structure, we reran the exploratory factor analysis (Worthington and Whittaker, 2006). The originally established criteria, that is the six-factor solution, KMO measure of sample adequacy (0.83), Bartlett’s Test ($p < .05$), and item communalities (> 0.50), were all met following item deletion.

We retained 21 items that loaded on the six factors, which together accounted for 68% of the variance. The item loadings for the six factors are shown in Table 4. The items designed to measure financial security and ability to fund the venture merged into one 6-

(footnote continued)

difference in the scores for “worry” ($M = 2.44$, $SD = 1.19$) and “afraid” ($M = 2.41$, $SD = 1.15$) conditions; $t(159) = 0.87$, $p = .39$. Finally, there was no significant difference in the scores for “anxiety” ($M = 2.72$, $SD = 1.28$) and “worry” ($M = 2.72$, $SD = 1.31$) conditions; $t(159) = 0$, $p = 1$. These confirmed that the words fear, anxiety, and worry can be used interchangeably.

² We compared results of the principal component analysis with those of the more conservative principal-axis factoring analysis. The solution was the same.

Table 3

Item development: The initial entrepreneurial fear of failure measure.

Over the past few months, I have been afraid...

Financial Security (FS)

1. ...of investing more money into the business
2. ...of losing all I have invested in the business
3. ...of running out of money
4. ...of leaving myself with no source of income
5. ...that a failure of my business will have financial consequences on my family
6. ...of risking my personal investment in the business
7. ...of losing all my savings

Personal Ability (PA)

8. ...of not being able to pitch the idea effectively
9. ...of not being able to manage the business effectively
10. ...of not being able to fulfil all the roles that this job requires
11. ...of not being able to manage people effectively
12. ...of not having the right skill sets to build the product/service
13. ...about my own ability to make this business successful
14. ...of not knowing what is needed to run a business

Threat to Social Esteem (TSE)

15. ...of losing the trust of people who are important to me
16. ...of not being accepted by all my stakeholders
17. ...of other people's expectations of me
18. ...of others thinking I have no idea of what I am doing
19. ...of losing credibility with actual or potential clients
20. ...of the reputational consequences of not paying people
21. ...of disappointing the people who are important to me

Potential of the Idea (PI)

22. ...that this idea won't be successful
23. ...that there is no need for our product/service out there
24. ...that the idea is not good enough for investors
25. ...that this is not a valuable business idea
26. ...that no one will be interested in the product/service
27. ...that this business idea is too difficult to implement
28. ...that there won't be a market for the product/service

Opportunity Costs (OC)

29. ...of losing my work-life balance
30. ...of missing important events of my life because of my business
31. ...of not being able to spend enough time with my family and friends
32. ...of not being able to spend time on other income producing endeavors
33. ...that the money spent on this business could be used elsewhere
34. ...of having to choose between more secure and less secure job opportunities
35. ...that running this business is taking my time away from other activities

Ability to Fund the Venture (F)

36. ...of not getting enough funding to move the company forward
37. ...of not being able to finance the business
38. ...about the financial challenges of starting a new business
39. ...of investors not being interested in the business
40. ...of not making enough money to finance future business growth
41. ...about the financial situation of the business
42. ...of not being able to get the required funding for the business

Venture's Capacity to execute (VE)

43. ...of the organization's ability to execute the business plan
44. ...of the organization's ability to exploit this business opportunity
45. ...of the organization's ability to overcome technical challenges
46. ...of the organization's ability to make enough sales
47. ...of the organization's ability to meet client expectations
48. ...of the organization's ability to deliver upon promises
49. ...of the organization's ability to develop the product/service

item factor, which we subsequently labelled financial concerns. The three items designed to measure personal ability loaded on the second factor. The three items designed to measure opportunity costs loaded on the third factor. The three items designed to reflect threat to social esteem loaded on the fourth factor. The three items designed to measure potential of the idea loaded on the fifth factor, and the three items designed to measure venture's capacity to execute loaded on the sixth factor. We note that there are negative loadings for all of the items representing potential of the idea and venture capacity to execute. However, this reflects an artefact of the factor rotation process whereby, through the process called 'reflection' (Nunnally and Bernstein, 1994: 494), "the signs of all the structure elements for a given factor may be reversed." The fact that all of the items share the same sign means they share the same orientation towards the latent dimension, and the sign itself can be disregarded "because it does not matter here whether the projection is positive or negative" (Thurstone, 1931: 415). This interpretation is supported by the positive correlations among all factors (Table 5).

Table 4

Pilot study: Item loadings for the six factors.

Item	FC	PA	OC	TSE	PI	VE
36. ...of not getting enough funding to move the company forward	0.81	–	–	–	–	–
37. ...of not being able to finance the business	0.84	–	–	–	–	–
42. ...of not being able to get the required funding for the business	0.80	–	–	–	–	–
2. ...of losing all I have invested in the business	0.64	–	–	–	–	–
3. ...of running out of money	0.63	–	–	–	–	–
7. ...of losing all my savings	0.68	–	–	–	–	–
9. ...of not being able to manage the business effectively	–	0.82	–	–	–	–
10. ...of not being able to fulfil all the roles that this job requires	–	0.82	–	–	–	–
11. ...of not being able to manage people effectively	–	0.73	–	–	–	–
30. ...of missing important events of my life because of my business	–	–	0.84	–	–	–
31. ...of not being able to spend enough time with my family and friends	–	–	0.81	–	–	–
35. ...that running this business is taking my time away from other activities	–	–	0.79	–	–	–
15. ...of losing the trust of people who are important to me	–	–	–	0.79	–	–
17. ...of other people's expectations of me	–	–	–	0.79	–	–
21. ...of disappointing the people who are important to me	–	–	–	0.81	–	–
23. ...that there is no need for our product/service out there	–	–	–	–	–0.79	–
25. ...that this is not a valuable business idea	–	–	–	–	–0.80	–
26. ...that no one will be interested in the product/service	–	–	–	–	–0.78	–
45. ...overcome technical challenges	–	–	–	–	–	–0.71
47. ...meet client expectations	–	–	–	–	–	–0.81
48. ...deliver upon promises	–	–	–	–	–	–0.69

Note. FC = financial concerns; PA = personal ability; OC = opportunity costs; TSE = threat to social esteem; PI = potential of the idea; VE = venture's capacity to execute. $N = 211$.

Table 5

Pilot study: Means, standard deviations, correlations, and coefficient alphas (on the diagonal) of EFF dimensions.

Dimension	M	SD	1	2	3	4	5	6
1. Financial concerns	3.29	0.85	0.85					
2. Personal ability	2.90	0.88	0.25**	0.72				
3. Opportunity costs	3.08	0.98	0.31**	0.18*	0.78			
4. Threat to social esteem	2.91	0.97	0.43**	0.26**	0.25**	0.79		
5. Potential of the idea	2.79	0.93	0.39**	0.31**	0.21**	0.35**	0.79	
6. Venture's capacity to execute	3.05	0.88	0.34**	0.41**	0.26**	0.31**	0.42**	0.76

Note. $N = 211$. EFF = Entrepreneurial Fear of Failure.

** Correlation is significant at the 0.01 level (2-tailed).

* Correlation is significant at the 0.05 level (2-tailed).

We report in Table 5 the means, standard deviations, intercorrelations, and Cronbach's alpha for the six factors. The table shows that the factors were distinct and moderately correlated (average $r = 0.31$, maximum $r = 0.43$, [Cohen and Cohen, 1983]). Internal consistency reliability estimates are acceptable for the six dimensions, ranging from 0.72 to 0.85 (Nunnally and Bernstein, 1994).

6. Validation studies

At this stage, we sought validation of the first-order reflective dimensions of entrepreneurial fear of failure before going on to establish the validity of the second-order formative construct (Edwards and Bagozzi, 2000). Consistent with the process of scale validation, we then aimed to examine theoretically relevant relationships between our proposed measure and other constructs that have been developed elsewhere (e.g., Atkinson, 1957; Cacciotti et al., 2016; Martin and Marsh, 2003; Morgan and Sisak, 2016). In order to demonstrate the construct validity of our measure of entrepreneurial fear of failure, we therefore included in our validation studies an examination of some elements of the nomological network of the construct to provide convergent, discriminant, and criterion related validity (Campbell and Fiske, 1959; Hinkin, 1998; Nunnally and Bernstein, 1994; Lewis, 2003).

Given the nature of the validation approach (Hinkin, 1998), we used three different samples. To minimize the threat of common-method bias (Podsakoff et al., 2003), we guaranteed the anonymity of respondents and counterbalanced the question order in all the surveys. In sample 3, we also separated the collection of the independent variables from the dependent variables across multiple waves of data collection. In sample 2 and sample 3 we also used the marker variable method (Edwards, 2011) to empirically test for the presence of common method variance (CMV) in the data. To provide a more general and complete understanding of fear of failure in entrepreneurship, we employed a sample of postgraduate students who expressed a preference for entrepreneurship and attended an entrepreneurship course (sample 1) and two heterogeneous samples of entrepreneurs (sample 2 and sample 3) from different countries, different sectors, and with different levels and types of experience. The purpose of such an approach was to demonstrate the applicability and validity of the measure across samples and contexts.

6.1. Samples

6.1.1. Sample 1

We collected data from 142 potential and active entrepreneurs. Participants were selected from postgraduate courses in entrepreneurship in three major universities in United Kingdom. In contacting the potential participants, we followed the same procedure that had been applied to our pilot study.

6.1.2. Sample 2

We collected data from 110 active entrepreneurs. This provided a strong context for replication because it allowed us to assess the newly developed instrument and further test its construct validity in a sample of people currently involved in entrepreneurship. Entrepreneurs were recruited for the study through new venture incubators in UK and Italy. They were first contacted with an explanation of the purpose of the study and a request for participation. Upon receiving their approval, we sent instructions and a link to the online survey.

6.1.3. Sample 3

We collected longitudinal data using the proprietary Bilendi panel, a data collection and management company. The data-collection strategy involved three waves at six-month intervals, targeting 200 entrepreneurs that the service provider could identify ex-ante as being self-employed in the United Kingdom. Participants were asked to take part in an online survey about their entrepreneurial activity. Entrepreneurial fear of failure was measured in all waves. However, in the last follow-up study, we also included measures of personal initiative and persistence to assess the impact of entrepreneurial fear of failure on perceived behavioral tendencies. In the first wave, we received responses from 171 individuals (an 85.5% response rate) who were re-contacted in the second and third wave, generating 105 usable pairs of online questionnaires (a 61.4% response rate).

6.2. Measures

Along with our new measure of entrepreneurial fear of failure, we administered other measures to establish its nomological network. To assess convergent validity, we included measures of constructs purported to assess fear of failure or very similar constructs. To assess discriminant validity, we included measures of theoretically distinct constructs that are, nonetheless, expected to be associated with entrepreneurial fear of failure. To assess the criterion-related validity of the new measure, we included measures of psychological outcomes and perceived behavioral tendencies that can theoretically be expected to be influenced by entrepreneurial fear of failure. Collectively, evidence for convergent, discriminant, and criterion-related validity contribute vital evidence for the construct validity of the new measure (Campbell and Fiske, 1959; Hinkin, 1998).

We controlled for the demographic characteristics of the respondents such as age, gender, and education as well as previous start-up experience and firm age. It is suggested that entrepreneurs' age could be responsible for differences in outcomes (e.g., Baron, 2009; Schieman et al., 2001). Past studies also showed that gender differentially influences psychological outcomes (e.g., wellbeing) (e.g., Harris et al., 1988; Pugliesi, 1995) and the perception of fear of failure (e.g., Minniti and Nardone, 2007). It is also suggested that smaller and younger firms may be more exposed to risk of failure than older and more established ventures (Stinchcombe, 1965; Uy et al., 2013), which could account for differences not only in wellbeing but also in the level of entrepreneurial fear of failure. Table 6 presents a summary of the measures used in the validation process.

6.3. Measurement model for entrepreneurial fear of failure

Consistent with the theoretical argument discussed above and building on the results of the pilot study, we developed a measurement model of entrepreneurial fear of failure as a second-order multidimensional construct (Edwards, 2001). At the lower level, items that describe experience with the specific appraisals are treated as *reflective* of the underlying latent dimensions (Bollen and Lenox, 1991). This means, for example, that an entrepreneur's fears with respect to her/his inability to develop the venture should be consistently reflected in her/his answers across a set of related items targeting fears about the inability to develop the venture. At the higher level, experiences of entrepreneurial fear of failure do not need to be simultaneously high (or low) across all the dimensions of the construct. Accordingly, we modeled the relationships between measures of each first-order dimension and the second order latent construct of overall entrepreneurial fear of failure as *formative* (Bagozzi, 2007; Diamantopoulos et al., 2008). This resulted in a hybrid multidimensional model of entrepreneurial fear of failure. In order to ensure model identification, we followed the procedures outlined by Edwards (2011) in a multiple indicator-multiple causes model using the five items of the Conroy PFAI to load directly on the second order factor for fear of failure.

We conducted our Confirmatory Factor Analysis (CFA) using AMOS 22. We used several measures of goodness-of-fit to evaluate the results, including the following absolute fit indices: the goodness-of-fit index (GFI); the root mean square residuals (RMR); and the standardized root mean square residuals (SRMR). We also assessed relative indices: the Incremental Fit Index (IFI); and the Tucker-Lewis Index (TLI) or Non-Normed Fit Index (NNFI). In addition, we examined two centrality-based indices: the root-mean-square error of approximation (RMSEA), and the comparative fit index (CFI). Hu and Bentler (1999) suggested that an appropriate "cutoff" for the RMR is < 0.10 and SRMR should be < 0.08. Values exceeding 0.90 are generally accepted to indicate good model fit for the GFI, the NNFI, and CFI (Hu and Bentler, 1998). Finally, an RMSEA of between 0.08 and 0.10 provides a mediocre fit, while below 0.08 shows a good fit (MacCallum et al., 1996), although subsequently, a cut-off value close to 0.06 (Hu and Bentler, 1999) or a

Table 6
Validation studies: summary of convergent, discriminant, (incremental) criterion-related validity and common method variance measures.

Measure	Sample items	Reference	Included in which sample	# of scale points	# of items	α range
Convergent validity PFAI	"When I am failing, I am afraid that I might not have enough talent"	Conroy et al. (2002, 2003a, 2003b)	1	5	5	0.71
	"When I am failing, it upsets my 'plan' for the future"					
	I feel "afraid"					
	I feel "scared"					
PANAS-X	"I am presently worrying over possible misfortunes"	Watson and Clark (1994)	1	5	6	0.86
	"I feel tense"	Spielberger et al. (1983)	1	4	20	0.89
Discriminant validity Self-efficacy	"I will be able to achieve most of the goals that I have set for myself"	Chen et al. (2004)	1	5	8	0.83
	"When facing difficult tasks, I am certain that I will accomplish them"	Mitchell and Shepherd (2010) based on Vesper (1996)	1	7	8	0.87
"I am able to select opportunities that are most likely to be profitable"						
"I have a knack for pursuing the right opportunities"						
"On the whole, I am satisfied with myself"						
Entrepreneurial self-efficacy	"At times, I think I am no good at all"	Rosenberg (1965)	1	5	10	0.81
	"Does your mood often go up and down?"	Eysenck et al. (1985)	2	5	12	0.84
(Incremental) Criterion-related validity Neuroticism	"Do you often feel 'fed-up'?"	Goldberg (1978)	2	4	12	0.86
	"Have you recently been able to concentrate on what you were doing?"					
Psychological wellbeing	"Have you recently felt that you were playing a useful part in things?"	Diener et al. (1985)	2	7	5	0.80
	"In most ways my life is close to my ideal"					
Subjective wellbeing	"The conditions of my life are excellent"	Frese et al. (1997)	3 (wave 3)	5	7	0.88
	"I actively attack problems"					
Personal Initiatives	"Whenever something goes wrong, I search for a solution immediately"	Baum and Locke (2004)	3 (wave 3)	5	6	0.79
	"I can think of many times when I persisted with work when others quit"					
Persistence	"I continue to work hard on projects even when others oppose me"	Cartera et al. (2003) Stephan et al. (2015) Zimet et al. (1988)	2	5	3	0.80
	"To build a business my children can inherit"					
Common method variance Entrepreneurial motivation (family and legacy)	"My peers really try to help me"	3 (waves 2 and 3)	7	4	4	0.94, 0.91
	"I get the emotional help and support from my peers"					

stringent upper limit of 0.07 (Steiger, 2007) seems to be more generally accepted.

6.4. Results

6.4.1. Are the dimensions of entrepreneurial fear of failure independent of each other?

The initial CFA results demonstrate only moderate fit for the six-factor model. Our inspection of modification indexes, standardized residuals, and factor loadings showed that 2 items reported comparatively low loadings and 1 item was loading on more than one factor. When developing and validating a new measure, one solution to such situations is to delete the items that have low loadings and load on more than one factor (e.g., Anderson and Gerbing, 1988; Hinkin, 1998). Accordingly, we eliminated low loading and double-loading items and obtained an 18-item six-factor model, which demonstrated a better fit (GFI = 0.84; RMR = 0.09; SRMR = 0.07; IFI = 0.92; TLI = 0.90; RMSEA = 0.06; and CFI = 0.91).

The elimination of problem items improved model fit but its side-effect was the loss of all the items that reflected the dimension we called venture's capacity to execute. However, six conceptually defined dimensions can be still identified in the six-factor model because, contrary to our findings from the pilot study, the financial security items and ability to fund the venture items did not merge into a single factor. These differences might be attributed to the characters of the samples. In the pilot study, the sample comprised postgraduate students interested in entrepreneurship, with more potential entrepreneurs than active entrepreneurs (full time entrepreneurs = 16%; part time entrepreneurs = 22%). Because the items concerning the venture's capacity to execute relate to fears that become more relevant at later stages of entrepreneurship (e.g., fear of not delivering upon promises), these fears might not be consistently experienced by potential entrepreneurs or entrepreneurs at early stages of venture creation. Similarly, in the pilot study, people might not have fully distinguished between financial concerns related to their personal financial stability (financial security) and those related to the financial viability of their venture (ability to fund the venture).

Based on these observations and the resultant modification of the first-order factor structure, we further examined the goodness-of-fit of the six-factor model by contrasting it with two alternative CFA models. First, we collapsed the six dimensions to represent a single construct (Model B: one factor) to further assess the factor independence of our six-factor model (Model A: six factors). Second, we examined a seven-factor model (Model C: seven factors), which included the three eliminated items, to compare the new factor solution with the one obtained in the item development study. We wanted to check whether constraining the model to six factors resulted in losing a potentially relevant dimension of entrepreneurial fear of failure—one which would have been in a seven-factor model. Goodness-of-fit statistics for the three models are reported in Table 7. The results indicate that the entrepreneurial fear of failure items are represented by a multidimensional solution as opposed to a unidimensional one. Furthermore, the six-factor solution of Model A showed a marginally better fit than the seven-factor Model C (GFI = 0.85; RMR = 0.09; SRMR = 0.06; IFI = 0.92; TLI = 0.90; RMSEA = 0.06; and CFI = 0.92). These results suggest that a six-factor model has statistical support.

We replicated the factor structure in a sample of active entrepreneurs (sample 4) to re-evaluate the fit of the measurement model. These results (Table 7) again support the six-factor model. Therefore, we adopted the more parsimonious approach and chose to retain the six-factor model for subsequent analyses (see Appendix for a description of the final measure). We report items and their loadings for the six-factor model in Table 8. As was the case in the pilot study for potential of the idea and venture capacity to execute, there are negative loadings for all of the items representing financial security in both samples. As CFA uses the same underlying architecture as the exploratory factor model, we interpret negative loadings for all items in a single first-order latent dimension as artefactual in the measurement model. Supporting this interpretation, we note that the intercorrelations of the latent first order dimensions are all positive (see Tables 9–11) and are therefore not influenced by the negative loadings on any factor.

6.4.2. Are the dimensions of entrepreneurial fear of failure consistent and reliable across samples?

Means, standard deviations, and correlations for the dimensions of the measure of entrepreneurial fear of failure across the samples are presented in Tables 9, 10, and 11. We examined an index of internal consistency reliability by calculating coefficient alphas for each dimension. We found acceptable levels of reliability for each dimension (minimum $\alpha = 0.75$, maximum $\alpha = 0.93$). We also found that the average intercorrelation among these dimensions was consistently moderate (sample 1: mean $r = 0.33$,

Table 7
Validation studies: comparison among CFA models.

Model	χ^2/df	GFI	RMR	SRMR	IFI	TLI	RMSEA	CFI
Sample 1								
Model A: six factors	1.53**	0.85	0.09	0.06	0.92	0.90	0.06	0.92
Model B: one factor	5.46**	0.39	0.34	0.25	0.12	0.03	0.18	0.11
Model C: seven factors	1.47**	0.84	0.09	0.07	0.92	0.90	0.06	0.91
Sample 2								
Model A: six factors	1.46**	0.86	0.09	0.06	0.95	0.93	0.06	0.95
Model B: one factor	4.74**	0.54	0.21	0.15	0.44	0.37	0.18	0.43
Model C: seven factors	1.51**	0.84	0.09	0.07	0.93	0.91	0.06	0.93

Note: N (sample 1) = 142.

N (sample 2) = 110.

** $p < .01$.

Table 8

Validation studies: Item loadings of the EFF measure.

Item*	Sample 1						Sample 2					
	F	PI	TSE	OC	PA	FS	F	PI	TSE	OC	PA	FS
36. ...of not getting enough funding to move the company forward	0.92	-	-	-	-	-	0.91	-	-	-	-	-
37. ...of not being able to finance the business	0.80	-	-	-	-	-	0.79	-	-	-	-	-
42. ...of not being able to get the required funding for the business	0.90	-	-	-	-	-	0.92	-	-	-	-	-
23. ...that there is no need for our product/service out there	-	0.87	-	-	-	-	-	0.86	-	-	-	-
25. ...that this is not a valuable business idea	-	0.92	-	-	-	-	-	0.74	-	-	-	-
26. ...that no one will be interested in the product/service	-	0.73	-	-	-	-	-	0.82	-	-	-	-
15. ...of losing the trust of people who are important to me	-	-	0.71	-	-	-	-	-	0.87	-	-	-
17. ...of other people's expectations of me	-	-	0.83	-	-	-	-	-	0.89	-	-	-
21. ...of disappointing the people who are important to me	-	-	0.87	-	-	-	-	-	0.73	-	-	-
30. ...of missing important events of my life because of my business	-	-	-	0.68	-	-	-	-	-	0.83	-	-
31. ...of not being able to spend enough time with my family and friends	-	-	-	0.83	-	-	-	-	-	0.76	-	-
35. ...that running this business is taking my time away from other activities	-	-	-	0.80	-	-	-	-	-	0.72	-	-
9. ...of not being able to manage the business effectively	-	-	-	-	0.76	-	-	-	-	-	0.88	-
10. ...of not being able to fulfil all the roles that this job requires	-	-	-	-	0.73	-	-	-	-	-	0.82	-
11. ...of not being able to manage people effectively	-	-	-	-	0.85	-	-	-	-	-	0.75	-
2. ...of losing all I have invested in the business	-	-	-	-	-	-0.80	-	-	-	-	-	-0.75
3. ...of running out of money	-	-	-	-	-	-0.92	-	-	-	-	-	-0.74
7. ...of losing all my savings	-	-	-	-	-	-0.90	-	-	-	-	-	-0.88

Note. EFF = Entrepreneurial fear of failure; F = Ability to fund the venture; OE = Opportunity costs; PI = Potential of the idea; TSE = Threat to social esteem; FS = Financial security; PA = Personal ability. N (sample 1) = 142. N (sample 2) = 110. All items loaded significantly on their respective factors ($p < .001$). * The order of how the dimensions are presented in the tables for the validation studies is distinct from the tables in the pilot study because of differences in the factor solutions.

Table 9Validation studies: Means, standard deviations, reliabilities (α), AVE and correlations for sample 1.

Dimension	M	SD	α	1	2	3	4	5	6
1. Ability to fund the venture	3.25	1.01	0.89	0.76					
2. Potential of the idea	2.87	1.05	0.86	0.33**	0.71				
3. Threat to social esteem	2.80	0.97	0.78	0.29**	0.30**	0.65			
4. Opportunity costs	2.92	1.01	0.75	0.27**	0.33**	0.30**	0.59		
5. Personal ability	2.92	0.92	0.75	0.43**	0.27**	0.33**	0.20*	0.61	
6. Financial security	2.85	1.07	0.80	0.48**	0.41**	0.24**	0.38**	0.39**	0.62

Note: N = 142; The bold diagonal elements are the square root of the variance shared between the dimensions and their measures (i.e., AVE = the average variance extracted). AVE values higher or equal to 0.50 demonstrate convergent validity of items on their latent factors. Within measure discriminant validity is demonstrated if the diagonal elements are larger than any corresponding row or column entry (Fornell and Larcker, 1981).

** $p < .01$.

Table 10Validation studies: Means, standard deviations, reliabilities (α) and correlations for sample 2.

Dimension	M	SD	α	1	2	3	4	5	6
1. Ability to fund the venture	3.43	1.02	0.89	-					
2. Potential of the idea	2.69	1.06	0.85	0.13	-				
3. Threat to social esteem	2.65	1.05	0.87	0.18	0.42**	-			
4. Opportunity costs	3.03	1.00	0.81	0.19*	0.25**	0.35**	-		
5. Personal ability	3.04	0.99	0.86	0.34**	0.43**	0.53**	0.29**	-	
6. Financial security	3.07	1.07	0.83	0.45**	0.24*	0.27**	0.23*	0.12	-

Note: N = 110.

* $p < .05$.

** $p < .01$.

range = 0.20 to 0.48; sample 2: mean $r = 0.30$, range = 0.12 to 0.48; sample 3: mean = 0.52, range = 0.30 to 0.73), indicating that the six dimensions are positively associated but relatively independent. Evidence for the validity of the internal structure of the measurement model is shown by an average variance extracted (AVE) that is both > 0.50 and higher than the shared variance between factors (Fornell and Larcker, 1981). The results show this supportive pattern of relations between items and latent factors, and between factors (see Table 9).

Table 11
Validation studies: means, standard deviations, reliabilities (α), and correlations for sample 3.

Dimension	M	SD	α	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18
1. Ability to fund the venture (T1)	2.46	0.96	0.89	-																	
2. Potential of the idea (T1)	2.36	0.87	0.84	0.62**	-																
3. Threat to social esteem (T1)	2.54	0.91	0.83	0.52**	0.61**	-															
4. Opportunity costs (T1)	2.67	0.99	0.88	0.28**	0.33**	0.42**	-														
5. Personal ability (T1)	2.40	0.82	0.79	0.63**	0.68**	0.52**	0.46**	-													
6. Financial security (T1)	2.63	0.95	0.79	0.63**	0.68**	0.55**	0.36**	0.55**	-												
7. Ability to fund the venture (T2)	2.45	1.09	0.92	0.70**	0.47**	0.41**	0.29**	0.49**	0.49**	-											
8. Potential of the idea (T2)	2.32	0.95	0.84	0.52**	0.59**	0.41**	0.21**	0.51**	0.40**	0.62**	-										
9. Threat to social esteem (T2)	2.58	1.02	0.87	0.38**	0.43**	0.60**	0.43**	0.50**	0.36**	0.56**	0.64**	-									
10. Opportunity costs (T2)	2.58	0.97	0.85	0.19	0.22	0.37**	0.66**	0.31**	0.14	0.29	0.22**	0.60**	-								
11. Personal ability (T2)	2.33	0.92	0.83	0.42**	0.42**	0.45**	0.47**	0.50**	0.35**	0.63**	0.60**	0.64**	0.53**	-							
12. Financial security (T2)	2.46	0.99	0.83	0.60**	0.60**	0.46**	0.33**	0.53**	0.67**	0.73**	0.65**	0.56**	0.31**	0.54**	-						
13. Ability to fund the venture (T3)	2.43	1.06	0.93	0.67**	0.37**	0.35**	0.16	0.50**	0.39**	0.61**	0.40**	0.24**	0.13**	0.35**	0.47**	-					
14. Potential of the idea (T3)	2.40	0.97	0.83	0.45**	0.61**	0.46**	0.10	0.52**	0.44**	0.39**	0.67**	0.38**	0.06	0.27**	0.47**	0.52**	-				
15. Threat to social esteem (T3)	2.64	1.01	0.85	0.31**	0.35**	0.50**	0.22**	0.34**	0.26**	0.28**	0.40**	0.54**	0.32**	0.35**	0.37**	0.45**	0.56**	-			
16. Opportunity costs (T3)	2.60	0.93	0.82	0.16	0.15	0.27**	0.51**	0.52**	0.14	0.19	0.18	0.31**	0.53**	0.34**	0.24**	0.30**	0.30**	0.46**	-		
17. Personal ability (T3)	2.26	0.87	0.77	0.44**	0.35**	0.40**	0.20**	0.47**	0.29**	0.49**	0.51**	0.50**	0.22**	0.54**	0.45**	0.63**	0.55**	0.62**	0.38**	-	
18. Financial security (T3)	2.62	0.94	0.81	0.63**	0.47**	0.42**	0.31**	0.48**	0.60**	0.47**	0.41**	0.29**	0.18	0.29**	0.57**	0.73**	0.59**	0.45**	0.46**	0.49**	-

Note. N = 105; T = Time.

* p < .05.

** p < .01.

6.4.3. Does the measure exhibit convergent and discriminant validity?

We examined the extent to which the new measure demonstrates convergent validity with other measures that purport to assess the same or very similar constructs (Campbell and Fiske, 1959; Hinkin, 1998). To assess convergence, we used the multidimensional PFAI measure (Conroy, 2001; Conroy et al., 2002, 2003a; see Klaukien and Patzelt, 2009; Mitchell and Shepherd, 2010, 2011; Wood et al., 2013, 2014), and the PANAS-X fear subscale (Watson and Clark, 1994; see Foo, 2011; Grichnik et al., 2010). We also used a measure of state anxiety that focuses on the temporary psychological state of anxiety, which is consistent with our conceptualization of entrepreneurial fear of failure as a state (e.g., Marteau and Bekker, 1992; Spielberger et al., 1983). We expected scores on these scales to be positively correlated with scores on the measure of entrepreneurial fear of failure. We also expected specific dimensions of our measure of entrepreneurial fear of failure to converge on similar dimensions of other measures of the same construct.

A second concern in assessing construct validity is whether the proposed new measure clearly discriminates between the focal construct and distinct but theoretically relevant constructs, such as self-efficacy, entrepreneurial self-efficacy, and self-esteem (Campbell and Fiske, 1959; Hinkin, 1998). For example, self-efficacy influences individuals' thought patterns and emotional reactions. While high self-efficacy creates a feeling of serenity when approaching difficult tasks and activities, low self-efficacy may lead to a belief that things are tougher than they really are and, thus, foster anxiety (Chen et al., 2004; McGee et al., 2009; Schunk and Pajares, 2007). The lower the belief in one's own ability to successfully launch an entrepreneurial venture, the higher the probability of experiencing fear and anxiety over entrepreneurial tasks and activities. Therefore, we expected self-efficacy and entrepreneurial self-efficacy to negatively relate to entrepreneurial fear of failure. We expected these negative relationships to be especially true for one of the dimensions of entrepreneurial fear of failure: personal ability. However, the correlation should be lower than that observed between two measures of the same construct.

We also expected self-esteem to have a negative relationship with entrepreneurial fear of failure. Individuals with low self-esteem possess a tendency for self-protection characterized by unwillingness to accept risks, are focused on avoiding outstandingly bad qualities, and are reluctant to draw attention to themselves (Baumeister et al., 1989). Therefore, evaluative situations with the potential for failure represent a source of anxiety because of the risk associated with exposing personal weaknesses. In entrepreneurship, where success is partly attributed to individuals' capabilities and where multiple stakeholders evaluate an entrepreneur's performance, low self-esteem would be expected to facilitate the perception of threats to self and one's esteem in the eyes of others (Birney et al., 1969). Accordingly, we expected self-esteem to have a negative relationship with two specific dimensions of entrepreneurial fear of failure: personal ability and threat to social esteem. While personal ability recalls the cognitive component of self-representation about one's own ability, threat to social esteem is influenced by the perception of oneself formed from important people's reactions. We also expected lower associations, or greater discriminant validity, between the remaining dimensions of the measure of entrepreneurial fear of failure and self-esteem.

For the purpose of this analysis, we calculated a composite measure of entrepreneurial fear of failure using unit weighting (Nunnally and Bernstein, 1994). As predicted, we found our measure to be positively related to the multidimensional measure of fear of failure (PFAI) ($r = 0.44$; $p < .01$), the PANAS-X fear subscale ($r = 0.44$; $p < .01$), and the state anxiety measure ($r = 0.47$; $p < .01$). We also examined the correlations between the PFAI and each dimension of entrepreneurial fear of failure. Scores on the PFAI were more closely related to threat to social esteem ($r = 0.53$; $p < .01$), personal ability ($r = 0.35$; $p < .01$), financial security ($r = 0.27$; $p < .01$), than they were to the ability to fund the venture ($r = 0.25$; $p < .01$), the potential of the idea ($r = 0.23$; $p < .01$), and opportunity costs ($r = 0.16$, n.s.). These findings highlight the uniqueness of the latter dimensions of entrepreneurial fear of failure, which are specific to the entrepreneurship context and are not incorporated within extant multidimensional measures of the construct. We summarize the convergent and discriminant validity evidence in Table 12.

As Table 12 shows, discriminant validity correlation coefficients were generally lower than the convergent validity coefficients, some were nonsignificant (17% of all correlations), and all of them were in the predicted direction (negative). As predicted, the entrepreneurial self-efficacy measure exhibited a weak and negative association with the measure of personal ability ($r = -0.18$, $p < .05$). Although correlations between general self-efficacy and personal ability ($r = -0.29$; $p < .01$), between self-esteem and

Table 12

Validation studies: Correlations among EFF and measures of theoretically similar constructs and dissimilar constructs.

Dimension	Theoretically Similar Constructs			Distinct Constructs		
	PFAI	PANAS-X	SA	GSE	ESE	SE
Ability to fund the venture	0.25**	0.25**	0.29**	-0.19*	-0.10	-0.18*
Potential of the idea	0.23**	0.23**	0.25**	-0.32**	-0.28**	-0.26**
Threat to social esteem	0.53**	0.32**	0.38**	-0.32**	-0.18*	-0.33**
Opportunity costs	0.16	0.24**	0.21*	-0.10	-0.13	-0.17*
Personal ability	0.35**	0.29**	0.38**	-0.29**	-0.18*	-0.27**
Financial security	0.27**	0.37**	0.37**	-0.25**	-0.27**	-0.30**
General entrepreneurial fear of failure	0.44**	0.44**	0.47**	-0.39**	-0.30**	-0.40**

Note: EFF = Entrepreneurial fear of failure; PFAI = Performance failure appraisal inventory (Conroy et al., 2002, 2003b); PANAS-X = negative affect fear subscale (Watson and Clark, 1994); SA = State anxiety (Spielberger et al., 1983); GSE = General self-efficacy (Chen et al., 2004); ESE = Entrepreneurial self-efficacy (Mitchell and Shepherd, 2011; Vesper, 1996). $N = 142$.

* $p < .05$.

** $p < .01$.

personal ability ($r = -0.27$; $p < .01$), and between self-esteem and threat to social esteem ($r = -0.33$; $p < .01$) were moderate, they were lower than those between the PFAI and the same dimensions of entrepreneurial fear of failure ($r = 0.35$, $p < .01$ for personal ability; $r = 0.53$, $p < .01$ for threat to social esteem). Although self esteem was moderately correlated with the financial security dimension ($r = -0.30$, $p < .01$), this correlation was lower than the convergent validity coefficients (e.g., PANAS-X, $r = .37$, $p < .01$; state anxiety, $r = .37$, $p < .01$). These findings support the conclusion that this measure of entrepreneurial fear of failure is empirically distinct from existing constructs.

6.4.4. Do the dimensions of entrepreneurial fear of failure change over time?

Using data from sample 3, we tested the ability of our measure to detect the variation in entrepreneurial fear of failure that occurs as the experience of entrepreneurship unfolds. In this three-wave study, we examined the stability of entrepreneurial fear of failure over time in order to assess whether the measure captures a dynamic, temporary state rather than a stable motive disposition. As noted by Asendorpf (1992, p.103) “if we repeatedly assessed inter-individual differences with methods of a high reliability and with only weeks or months between assessments, and if we found that the observed inter-individual differences fluctuated strongly from one assessment to the next, we could hardly argue that our measures reflect a personality trait. Instead, we might have measured the subjects' mood, motivation, or other rapidly fluctuating states. Thus, proving a high short-term retest stability of inter-individual differences is a necessary requirement for any study of personality.” To examine this, we used the Intraclass Correlation Coefficient—adopting a two-way, fixed effects, consistency approach—and focused on the stability of each single dimension and the aggregated scale across the three waves of data (McGraw and Wong, 1996; Chen and Barnhart, 2013). The intraclass correlation coefficient presents a more appropriate test of the stability of scores across test-retest situations (Shrout and Fleiss, 1979; McGraw and Wong, 1996). The relative degree of consistency of individual scores represents a test of intra-individual stability of the measure. The ICC estimates for the dimensions were: Financial Security (ICC = 0.61, $p < .001$), Personal Ability (ICC = 0.50, $p < .001$), Threat to Social Esteem (ICC = 0.55, $p < .001$), Potential of the Idea (ICC = 0.62, $p < .001$), Ability to Finance the Venture (ICC = 0.66, $p < .001$), and Opportunity Costs (ICC = 0.57, $p < .001$). The aggregate ICC score for the whole measure also shows only moderate consistency (ICC = 0.66, $p < .001$). These ICC estimates provide evidence that the scores this measure obtained for entrepreneurial fear of failure show only moderate consistency over a relatively short period time, which is inconsistent with a stable trait (Asendorpf, 1992).

6.4.5. Are the dimensions of entrepreneurial fear of failure related to relevant psychological outcomes?

Consistent with our theoretical arguments above, we articulate entrepreneurial fear of failure in terms of the potential for failure in tasks and responsibilities surrounding entrepreneurial activities (Cacciotti et al., 2016). As such, we expected entrepreneurial fear of failure to amplify the effect of stress deriving from engagement in entrepreneurial activities and, thus, to be negatively associated with psychological and subjective wellbeing (Baron et al., 2013; Chay, 1993; Shepherd and Patzelt, 2015; Uy et al., 2013). Building on our conceptualization of entrepreneurial fear of failure as a state, we also predicted its influence on psychological outcomes above and beyond more stable dispositions (e.g., neuroticism) (Costa Jr. and McCrae, 1980; Cropanzano and Dasborough, 2015; Suh et al.,

Table 13

Validation studies: Hierarchical regression analysis with unstandardized beta coefficients of EFF and psychological outcomes controlling for trait negative affectivity.

Variables	Model 1	Model 2	Model 3	Model 4	Model 5	Model 6
	DV: SWB	DV: SWB	DV: SWB	DV: PWB	DV: PWB	DV: PWB
(constant)	4.95	7.29	8.22	3.31	4.98	5.41
Age	-0.24*	-0.32**	-0.31**	-0.04	-0.09	-0.10
Gender	-0.01	0.27	0.21	-0.07	0.13	0.07
Education	0.12	0.11	0.12	-0.01	-0.02	-0.01
Previous experience	0.18	-0.01	0.10	0.01	-0.01	-0.00
Firm age	0.04	0.04	0.04	0.00	0.00	0.01
Neuroticism		-0.92**	-0.72**		-0.66**	-0.48**
Ability to fund the venture			-0.16			0.02
Potential of the idea			0.03			0.01
Threat to social esteem			0.14			0.02
Opportunity costs			-0.07			-0.11*
Personal ability			-0.05			-0.14*
Financial security			-0.31**			-0.07
R ²	0.05	0.28	0.42	0.10	0.44	0.54
ΔR^2		0.22**	0.15**		0.43**	0.11**
F	1.03	6.02**	5.43**	0.20	12.35**	8.84**
Cohen's f ² (for ΔR^2)			0.25			0.24

Note: EFF = Entrepreneurial fear of failure; DV = Dependent variable; SWB = Subjective wellbeing; PWB = Psychological wellbeing. For gender: 0 = male; 1 = female. For education: 1 = high school or equivalent, 2 = undergraduate degree or equivalent (BSc, BA etc.); 3 = some post graduate study; 4 = some university study; 5 = graduate degree (MSc, MA, MBA etc.); 6 = terminal degree (PhD, MD, LLD/JD). N = 110.

** $p < .01$.

* $p < .05$.

1996).

To test these relationships, we used hierarchical regression. As can be seen in Table 13, evidence that the size of the effect for the new measure is not only statistically significant, but it is, according to Cohen (1988), considered a medium sized effect in practical terms (Cohen's $f^2 = 0.25$ and 0.24 respectively). The addition of the new measure explains 15% additional variance in subjective wellbeing and 11% additional variance in psychological wellbeing over and above the variance already accounted for by dispositional neuroticism. The unstandardized beta coefficients suggest that a one unit increase in fear related to financial security will be associated with a 0.31 unit decrease in subjective wellbeing, while a one unit increase in concerns over personal ability to perform entrepreneurial tasks or worries that time should be spent on other activities will reduce psychological wellbeing by 0.14 and 0.11 units respectively. This is after controlling for the association of a stable motive disposition with the same dependent variables. The value of the Cohen's f^2 indicates that while the individual coefficients are only medium in size, these dimensions of entrepreneurial fear of failure explain a practically meaningful variation in wellbeing. The fact that this is observed after controlling the influence of neuroticism suggest that this effect is attributed to short-term experiences of entrepreneurial fear of failure, over and above enduring dispositional influences (Suh et al., 1996).

While we see evidence for meaningful and statistically significant estimates of the negative association between both subjective wellbeing and psychological wellbeing and the measure of entrepreneurial fear of failure, this association does not appear to be consistent across the dimensions of entrepreneurial fear of failure. This reinforces our conceptualization of entrepreneurial fear of failure as a formative construct, where its dimensions reflect different, relatively independent aspects of entrepreneurial fear of failure, whose salience varies with the consequences being considered.

6.4.6. Are the dimensions of entrepreneurial fear of failure related to relevant perceived behavioral tendencies?

Building on a body of psychological research evidence (Atkinson, 1957; Dweck and Leggett, 1988; Elliot, 1997; Martin and Marsh, 2003) and recent evidence in entrepreneurship research (e.g., Cacciotti et al., 2016; Mitchell and Shepherd, 2011; Morgan and Sisak, 2016), we expect that fear of failure is not only related to perceived behavioral tendencies to avoid performative contexts, but can also lead to approach behavior (as corroborated by the introductory quotation). Using data from sample 3 and applying hierarchical regression, we examined the predictive validity of the new measure as it relates to two constructs that are representative of perceived behavioral tendencies grounded in approach motivation: personal initiative and persistence.

We took advantage of the longitudinal data to examine whether the closer in time the experience of entrepreneurial fear of failure was to the assessment of perceived behavioral tendencies, the greater the strength of association would be between these measures. We expected the cross-sectional relationships to be stronger than the longitudinal relationships between entrepreneurial fear of failure and perceived behavioral tendencies. Results provide evidence that confirms this theorizing (Table 14). First, the observed effects vary across time, which supports our conceptualization of entrepreneurial fear of failure as a negative affective state. Furthermore, the greatest variance is explained in the perceived behavioral tendencies where fear of failure is measured concurrently (models 6 and 12), and the least is explained where the measures are furthest apart in time (models 2 and 8). Cohen's f^2 statistic for

Table 14

Validation studies: Hierarchical regression analysis with unstandardized beta coefficients of EFF and perceived behavioral tendencies.

Variables	EFF wave 1		EFF wave 2		EFF wave 3		EFF wave 1		EFF wave 2		EFF wave 3	
	Model 1	Model 2	Model 3	Model 4	Model 5	Model 6	Model 7	Model 8	Model 9	Model 10	Model 11	Model 12
	Personal initiative						Persistence					
(constant)	3.27	3.33	3.27	3.40	3.27	3.41	3.50	3.02	3.50	3.08	3.50	3.06
Age	0.01	0.00	0.01	0.01	0.01	0.01	-0.01	-0.01	-0.01	-0.01	-0.01	-0.01
Gender	0.15	0.16	0.15	0.13	0.15	0.17	0.02	-0.05	0.02	-0.10	0.02	-0.02
Education	-0.04	-0.03	-0.04	-0.05	-0.04	-0.06	-0.00	-0.02	-0.00	-0.04	-0.00	-0.05
Previous experience	-0.05	-0.00	-0.05	-0.06	-0.05	-0.02	0.04	0.09	0.04	0.08	0.04	0.06
Firm age	-3.47	0.00	-3.47	0.00	-3.47	0.00	0.01	0.01	0.01	0.01	0.01	0.02*
Ability to fund the venture		0.25**		0.13		0.19*		0.16		0.07		0.14
Potential of the idea		-0.04		-0.12		-0.20**		0		-0.17		-0.27**
Threat to social esteem		0.13		-0.17		0.17*		0.01		-0.19		0.08
Opportunity costs		0.20**		0.30**		0.12		0.30**		0.35**		0.23**
Personal ability		-0.40**		-0.20*		-0.48**		-0.24		-0.02		-0.17
Financial security		-0.18*		0.01		0.05		-0.06		0.18		0.16
R ²	0.04	0.24	0.04	0.26	0.04	0.36	0.04	0.20	0.04	0.26	0.04	0.27
ΔR ²		0.20**		0.22**		0.32**		0.16**		0.22**		0.23**
F	0.85	2.71**	0.85	2.30**	0.85	4.72**	0.85	2.14*	0.85	3.01**	0.85	3.20**
Cohen's f^2 (for ΔR ²)		0.23		0.30		0.50		0.20		0.30		0.32

Note. $N = 105$. EFF = Entrepreneurial fear of failure. For gender: 0 = male; 1 = female. For education: 1 = high school or equivalent, 2 = undergraduate degree or equivalent (BSc, BA etc.); 3 = some post graduate study; 4 = some university study; 5 = graduate degree (MSc, MA, MBA etc.); 6 = terminal degree (PhD, MD, LLD/JD).

* $p < .05$.

** $p < .01$.

the practical value of these effect sizes indicates that they are all medium and, in the case of the association with personal initiative in wave 3, the effect is large (see Table 14).

The results also provide evidence in support of a multidimensional approach to the measurement of entrepreneurial fear of failure. The effects of fears about the ability to fund the venture, and opportunity costs, are both positively associated with the perceived behavioral tendencies of personal initiative and persistence and indicate medium sized effects. The coefficient estimates indicate that for a 1 unit increase in these variables, the consequent positive increase in the perceived behavioral tendencies range from 0.20 to 0.35 units, which is a moderate but meaningful change. We contrast these with the observed negative effects for fears about financial security, potential of the idea, and personal ability. We see effect sizes here indicating that for a one unit increase in fears about financial security, potential of the idea, or personal ability, we can expect a negative effect on personal initiative ranging between -0.20 and -0.48 units. Similarly, for persistence, we can expect that fears about the potential of the idea reduce persistence by -0.27 units for every unit of increase in those fears. These are medium sized but practically meaningful effects. Taken together, this evidence reinforces the proposition that entrepreneurial fear of failure should be understood as a multidimensional construct. Some dimensions have a positive association with perceived behavioral tendencies to approach entrepreneurial activities, while others show a negative association. This is consistent with our theoretically derived expectations of a formative construct and provides criterion-related evidence that further supports the construct validity of our measure of entrepreneurial fear of failure.

6.4.7. Are common-method biases affecting the results of the criterion-related validity?

In order to assess whether CMV has influenced our results, we employed the methods advocated by Williams et al. (2010) which involves the identification of a marker variable, measured at the same time and by the same method as the variable(s) of interest to the analysis. This method requires that the marker variable be orthogonal to the variables of interest. Using data from sample 2, we selected one dimension of a measure of entrepreneurial motivation ("family and legacy") (Stephan et al., 2015). The items all demonstrated low correlations with the items for the measure of entrepreneurial fear of failure, a prerequisite for a marker variable. The presence of CMV is then evaluated using a series of nested CFA models.

The comparison models involve two alternative models with loadings linking the substantive items to the marker latent variable. In the first of these, referred to as Method C, the loadings linking the substantive items and the marker latent variable are fixed to be equal. In the second, referred to as Method U, the same loadings are allowed to vary freely. These two models are compared with a baseline model that includes the marker items and latent construct, but these are uncorrelated with the substantive items and latent constructs (for full details, see Williams et al., 2010). The benefit of this approach is that it provides a clear statistical criterion for whether estimates are influenced to a meaningful degree by CMV. That test is whether the change in Chi-square values is statistically significant. When we compared the fit of the baseline model ($\chi^2 = 232.08$; d.f. 179, $p < .01$; CFI 0.95) with both Model C ($\chi^2 = 230.66$; d.f. 179, $p < .01$; CFI 0.95) and Model U ($\chi^2 = 214.72$; d.f. 161, $p < .01$; CFI 0.95) we find that in neither case was there evidence for a significant difference in the fit (Baseline vs Model C: $\Delta\chi^2 = 1.43$; Δ d.f. 1; $p = .23$; Baseline vs Model U: $\Delta\chi^2 = 17.37$; Δ d.f. 18; $p = .50$). We repeated the same analysis with data from sample 3 using one dimension of a broader measure of perceived social support (i.e., perceived social support from peers) (Zimet et al., 1988) and again found no evidence for CMV. Therefore, we have confidence that the results of the criterion-related validity study are not influenced by CMV.

7. Discussion

Fear of failure is an important part of the entrepreneurial experience (Cacciotti et al., 2016). Yet past research has not sufficiently conceptualized *entrepreneurial* fear of failure as a construct that emerges from experience within the ambiguous and uncertain performative context of entrepreneurship. With this study we have sought to overcome this limitation by: (1) further developing the meaning of entrepreneurial fear of failure in terms of individuals' concrete experience within the performative context of entrepreneurship, and then (2) using this conceptualization to develop and validate a measure to assess this *entrepreneurial* fear of failure. In doing so, we contribute to theoretical, methodological, and empirical understandings of entrepreneurial fear of failure.

From a theoretical perspective, our multidimensional, formative, and temporal conceptualization of entrepreneurial fear of failure provides a better understanding of the meaning of venture failure in terms of the potential for failure in tasks and responsibilities surrounding a specific entrepreneurial activity rather than being limited to a fear of total collapse of the business venture. While the definition of failure as an all or nothing outcome may be appropriate for understanding how venture failure is perceived in studies that focus on the hypothetical possibility of failure (e.g., Arenius and Minniti, 2005), or those which focus on the after effects of actual venture demise (e.g., Singh et al., 2015), it does not reflect what entrepreneurs fear while engaging in the experience of entrepreneurship. In this sense, our multidimensional model adds to the literature a complementary view of fear of failure in entrepreneurship.

In addition, our conceptualization of entrepreneurial fear of failure and its resulting measure enables an understanding of entrepreneurial fear of failure that moves beyond viewing the construct as simply an inhibitor of entrepreneurship. Indeed, by focusing on the cognitive and affective components to conceptualize and measure entrepreneurial fear of failure, we move towards an approach that allows us to capture the relationship between fear of failure and outcomes that are grounded in both approach and avoidance motivation (e.g., Birney et al., 1969; Cacciotti et al., 2016; Conroy, 2001). Finally, we conceptually contribute to the appraisal theory of emotion and work on fear of failure that draws upon this notion (Conroy, 2001; Lazarus, 1991) by theorizing that the characteristics of the specific performative context of entrepreneurship will affect the way we define and study fear of failure in that context. Specifically, the uniqueness of the performative context of entrepreneurship is evident in the specific dimensions of entrepreneurial fear of failure. In this way we enhance the usefulness of the appraisal theory of emotion to research on fear of failure

in entrepreneurship. Similarly, the ambiguity and uncertainty of this performative context suggest that studying entrepreneurial fear of failure as a state rather than a trait will better capture the high instability caused by these characteristics.

From a methodological perspective, the new measure overcomes the theoretical and operational limitations of existing measures of fear of failure used in the entrepreneurship literature. Specifically, our instrument independently captures each conceptual dimension (ability to fund the venture, potential of the idea, threat to social esteem, opportunity costs, personal ability, and financial security), while also offering the possibility of aggregating these dimensions into a formative construct (entrepreneurial fear of failure). In this way, the measure can account for the temporal variability of experience within the performative context of entrepreneurship (Morris et al., 2012).

Our results from sample 3 indicate that the relevance of the dimensions of entrepreneurial fear of failure may vary depending on the specific entrepreneurial activity being undertaken by entrepreneurs. That is, our results suggest that where an entrepreneur is in the entrepreneurial process will influence the relevance of various dimensions of fear of failure. Such variability in the relevance of the dimensions of entrepreneurial fear of failure over time serves as further justification for conceptualizing it as consisting of reflective first-order dimensions that combine in a formative second-order construct. With a new measure of entrepreneurial fear of failure established, future research can begin to identify the prevalence, profiles, or patterns of the different dimensions of entrepreneurial fear of failure over time.

From an empirical perspective, our results show that the effects of entrepreneurial fear of failure on psychological outcomes and perceived behavioral tendencies are not uniform across the six dimensions. For example, we found that not all dimensions of entrepreneurial fear of failure are salient for either subjective wellbeing, or for psychological wellbeing. Similarly, we found that only some dimensions (e.g., threats to social esteem; concerns over ability to fund the venture; opportunity costs) resulted in positive pressure to work harder, while others (e.g., personal ability; potential of the idea) were negatively associated with the perceived behavioral tendencies of personal initiative and persistence. From the perspective of behavior, this evidence leads us to conclude that entrepreneurial fear of failure is neither uniform nor stable over time.

7.1. Implications for future research

Our development and validation of a measure of entrepreneurial fear of failure offers important benefits for research on this phenomenon as follows. First, defining and measuring entrepreneurial fear of failure as something that is part of the entrepreneurial experience opens up a number of opportunities that the existing entrepreneurship literature on fear of failure has thus far ignored. For example, it is now possible to examine the relationship between entrepreneurial fear of failure and any task or action that might be undertaken within the experience of entrepreneurship (Morris et al., 2012). One promising avenue of research could be to observe how entrepreneurial fear of failure influences an individual's level of effort on specific entrepreneurial tasks (Atkinson, 1957) and how that effect might change over time. Another promising avenue of research could be to observe how entrepreneurial fear of failure influences an individual's creativity in undertaking a specific entrepreneurial task (see, e.g., Bledow et al., 2013).

Second, a valid and reliable measure of entrepreneurial fear of failure as a multidimensional, formative construct makes it possible to investigate the salience of each dimension and thus its unique effects on different outcomes as the experience of entrepreneurship unfolds. The ability to address such questions in entrepreneurship through the new measure is helpful because it better enables the capturing of the transformative and idiosyncratic nature of the experience of entrepreneurship (Morris et al., 2012). Continuing along this line, we also see promise in using the measure in combination with other dynamic approaches to researching entrepreneurial fear of failure (e.g., use of a longitudinal research design). Moreover, because fear of failure can lead to outcomes that are grounded in both approach and avoidance motivation (e.g., Atkinson, 1957; Mitchell and Shepherd, 2011), we recommend that future research investigates entrepreneurial fear of failure along with other contextual and individual factors commonly associated with entrepreneurship, such as overconfidence (e.g., Lowe and Ziedonis, 2006), entrepreneurial passion (Cardon et al., 2009), level of aspiration (Morgan and Sisak, 2016), and coping strategies³ (Eager et al., 2019). We thus see this new conceptualization and measure of entrepreneurial fear of failure as enabling an increased understanding of the approach and avoidance aspects of the phenomenon of fear of failure in entrepreneurship (Cacciotti and Hayton, 2015).

Third, by conceptualizing fear of failure in terms of experience within the performative context of entrepreneurship, we also see possibilities for research using our conceptualization and measure of how fear of failure might exist at different level of analysis (e.g., venture teams) and how it might apply in adjacent contexts (e.g., family business, corporate venturing, bottom of the pyramid, etc.). Indeed, it is important to understand the extent to which entrepreneurial fear of failure is similar in its effects when the experience of entrepreneurship varies in meaningful and systematic ways. Similarly, it could be interesting to understand the effect of entrepreneurial fear of failure on teams pursuing new ideas, both in start-up organizations as well as existing firms. These and other outcomes can be addressed by future research.

Fourth, we note that our focus has been on entrepreneurial fear of failure and has sought to extend prior research on the topic (e.g., Arenius and Minniti, 2005; Cacciotti and Hayton, 2015; Langowitz and Minniti, 2007; Minniti and Nardone, 2007; Mitchell and Shepherd, 2010; Wood et al., 2014), but we acknowledge how our research can also be understood in terms of fear and anxiety more

³ With respect to coping, it is important to point out that, consistent with the appraisal theory of emotion (Lazarus, 1991), only the appraisal of experience (i.e., the primary appraisal) is necessary for the negative affective reaction of entrepreneurial fear of failure (Conroy et al., 2001). Nevertheless, we suggest that entrepreneurs' consideration of their coping potential (i.e. a secondary appraisal) can combine with their specific fear of venture failure to determine their behavioral response (e.g., Poczwadowski and Conroy, 2002).

broadly. That is, while anxiety and fear of failure specifically emerged as important themes within the qualitative interviews that we used to develop the initial pool of items herein (Cacciotti et al., 2016), our research can also be viewed as highlighting various aspects of the experience of entrepreneurship that can potentially lead an individual to experience fear more broadly. In this sense, we also see potential for considering how our measure might also be used to understand the broader concept of fear in entrepreneurship. A question remains regarding the extent to which entrepreneurial fear can exist independent from the potential for failure. We invite future research to consider this possibility and see our scale, which although grounded in the prior literature on fear of failure in entrepreneurship, may also be helpful in furthering this line of inquiry.

7.2. Limitations and further opportunities for future research

Our study is not without limitations. First, although we carefully considered the established psychology theories on fear of failure (Birney et al., 1969; Conroy, 2001; Lazarus, 1991; Ortony et al., 1988; Scherer et al., 2001) and recent entrepreneurship studies that focus on the nature of entrepreneurial fear of failure (Cacciotti and Hayton, 2015; Cacciotti et al., 2016), we recognize that all of this research (including our own) is primarily focused on interviews based in the United Kingdom and Canada. These interviews form the basis for our items. And although we have gone through a rigorous process to develop and validate the measure, we acknowledge that all of our samples are from developed, Western countries. It is possible, for example, that our concept of entrepreneurial fear of failure does not reflect every facet of this phenomenon as experienced in non-Western countries, or in less developed economies. While we have drawn upon a rigorous inductive study to specify the construct domain and define the facets of this measure, we acknowledge that it is possible that future research may identify additional, unmeasured facets of the construct which are distinct from those currently measured. Accordingly, we invite future research to complement our understanding of these dimensions by working to investigate the extent to which these are representative of the experience of entrepreneurial fear of failure in contexts that are culturally and institutionally different.

Second, we also see some potential limitations with some choices we made in the development of the measure. Specifically, we developed a measure that is self-reporting in nature; there is thus a need for future research to examine, for example, the convergent validity of our measure using biological data that capture a physiological reaction (e.g., cortisol levels). We also chose to use a five-point agree-disagree Likert-type format. Such a format has its own potential limitations, and we acknowledge that agree-disagree anchors may be associated with an acquiescence bias that constrains variance in responses and also leads to different cognitive processing requirements relative to more construct-specific response anchors (Aguinis et al., 2009). Moreover, while the agree-disagree response format can restrict variance in each item (which would likely have little effect on the factor structure or dimensionality of the measure), it is possible that our response format would manifest as range restriction in correlations among and between dimensions and the other constructs in our validation studies. This could then result in higher inter-scale correlations and correlations with other constructs. Thus, although we do not believe the choices we made in the development of the measure necessarily limit its validity and usefulness, we cannot rule out the possibility that different response formats might affect respondent interpretation of the items. For this reason, future research should also be undertaken to vary the scale anchors and response formats to further enhance the construct validity of the measure (see Appendix for a description of the measure).

7.3. Guidelines for using the measure of entrepreneurial fear of failure

In order to assist entrepreneurship researchers in future research on the role of entrepreneurial fear of failure, we offer specific suggestions for an effective use of our measure. First, as we found very little difference in fit between the six and seven factor solutions, we encourage future research to continue to refine the understandings of dimensionality in the entrepreneurial fear of failure measure. There is a clear potential for different aspects of the construct to become more and less salient in the experience of entrepreneurship over time. In order to investigate the role of entrepreneurial fear of failure as the venture develops and matures, we invite researchers to consider including the items associated with the venture's capacity to execute since they can potentially capture those fears that arise at later stages of entrepreneurship. Given the marginal statistical differences between the six-factor model and the seven-factor model in the validation studies, coupled with the inductive evidence for the presence of this dimension (Cacciotti et al., 2016), we believe that inclusion of the venture's capability to execute in the measure of entrepreneurial fear of failure makes theoretical and methodological sense. However, we invite researchers to take into account the research question they seek to answer and the design of their study as part of making this determination.

Second, we designed our measure to reflect the state aspect of entrepreneurial fear of failure. This is one reason for our use of the stem "over the past few months" in the measure, which provides entrepreneurs with a time frame to consider when reporting about their experience. While we believe that this time frame makes conceptual sense, in that it considers the amount of time that is required to engage in a number of entrepreneurial activities that can lead to the negative affective reaction of entrepreneurial fear of failure, we also advise researchers to consider which time frame would be most relevant to their research question and the associated design of their study (DeVellis, 2003).

Third, while we have provided evidence that CMV was not a concern across the studies reported here, we nevertheless recommend that scholars attempt to separate the measurement of the construct from the possible outcomes or predictors of interest, temporally or methodologically. If this is not possible, however, we suggest researchers also adopt the approach of including a "marker variable" (Edwards, 2011) that is orthogonal to the measure of entrepreneurial fear of failure. This can be used to estimate the presence of CMV, and if present, correct for its influence upon estimated relationships.

Fourth, as discussed previously, we are aware of the potential limitations that are associated with the range restriction that can

arise when using a 5-point scale format (Cardon et al., 2013). Accordingly, we follow Aguinis et al. (2009) and recommend that future research considers wider anchors (e.g., 7-point or 9-point scales; see Appendix). As noted earlier, we also recognize that there are potential limitations associated with the use of the response format of agree/disagree (Converse and Presser, 1986; Tourangeau et al., 2000). Accordingly, we recommend that researchers also consider whether to use this measure of entrepreneurial fear of failure with different response formats.

7.4. Conclusion

We conceptualized entrepreneurial fear of failure as a negative affective reaction that is based in cognitive appraisals of the potential for failure in the uncertain and ambiguous performative context of entrepreneurship. We developed and validated an instrument to assess the different dimensions of entrepreneurial fear of failure: ability to fund the venture; potential of the idea; threat to social esteem; opportunity costs; personal ability; and financial security. By doing so, we hope to help scholars advance knowledge about the fascinating and complex phenomenon of fear of failure in entrepreneurship.

CRedit authorship contribution statement

Gabriella Cacciotti:Conceptualization, Methodology, Formal analysis, Writing - original draft, Writing - review & editing.**James C. Hayton:**Conceptualization, Methodology, Formal analysis, Writing - original draft, Writing - review & editing.**J. Robert Mitchell:**Conceptualization, Methodology, Formal analysis, Writing - original draft, Writing - review & editing.**David G. Allen:**Conceptualization, Methodology, Formal analysis, Writing - original draft, Writing - review & editing.

Appendix A. Measure of entrepreneurial fear of failure

The measure of entrepreneurial fear of failure	
Instructions, scale anchors, and item for the dimensions of entrepreneurial fear of failure	
Instructions	Please indicate the extent to which you agree or disagree with each statement.
Scale anchors	1 = "strongly disagree"; 2 = "disagree"; 3 = "neither agree nor disagree"; 4 = "agree"; 5 = "strongly agree."
Note: When using this instrument, we recommend researchers consider using 7-point or 9-point scales to avoid issues of range restrictions. We also recommend researchers consider using "not at all afraid"/"very much afraid" type of anchor to avoid concerns associated with agreement-based question formats.	
Stem	Over the past few months, I have been afraid...
Dimensions	Validated items
F	...of not getting enough funding to move the company forward
F	...of not being able to finance the business
F	...of not being able to get the required funding for the business
PI	...that no one will be interested in the product/service
PI	...that this is not a valuable business idea
PI	...that there is no need for our product/service out there
TSE	...of other people's expectations of me
TSE	...of disappointing the people who are important to me
TSE	...of losing the trust of people who are important to me
OC	...that running the business is taking my time away from other activities
OC	...of missing important events of my life because of my business
OC	...of not being able to spend enough time with my family and friends
PA	...of not being able to manage people effectively
PA	...of not being able to manage the business effectively
PA	...of not being able to fulfil all the roles that this job requires
FS	...of running out of money
FS	...of losing all my savings
FS	...of losing all I have invested in the business/business activities
Stem	Over the past few months, I have been afraid of the organization's ability to...
VE*	...meet client expectations
VE*	...overcome technical challenges
VE*	...deliver upon promises

F = Ability to fund the venture; PI = Potential of the idea; TSE = Threat to social esteem; OE = Opportunity costs; PA = Personal ability; FS = Financial Security; VE* = Venture's capacity to execute excluded from the six-factor solution.

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