



# The virtuous cycle of entrepreneurial identity and experience – a longitudinal analysis

Ricardo Figueiredo Belchior<sup>1</sup> · Hugo Castro-Silva<sup>2</sup>

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## Abstract

Entrepreneurial identity represents a powerful motivating force that can help explain individuals' entrepreneurial activity and has been found to be relevant to several new business venturing decisions. Although identity may entail some degree of temporal stability, personal agency and social interactions may change it. While understanding entrepreneurial identity formation and development is a promising research topic, longitudinal analyses are lacking. In this study, we propose a longitudinal model in which intra-individual entrepreneurial identity aspirations exhibit path dependency, and test different types of entrepreneurial experiences as mediators affecting this relationship. Applying structural equation modeling to a longitudinal sample composed of individuals formerly enrolled in higher education programs, we found that past entrepreneurial identity aspirations predicted identity aspirations 11 years later. We also found that, while prior successful entrepreneurial experiences positively influenced current identity aspirations, unsuccessful experiences did not decrease them. It is noteworthy that these results hold even when considering working for others in new business projects as an (indirect) entrepreneurial experience. Our study contributes to the literature by extending the scarce longitudinal evidence that supports the temporal stability of entrepreneurial identity and by adding novel evidence regarding the mediating impact of real-life entrepreneurial experiences while considering both their direct and indirect nature and their positive and negative outcomes. This study may be relevant to policymakers and entrepreneurship educators by providing evidence of a virtuous cycle between entrepreneurial identity and action and its boundary conditions.

**Keywords** Entrepreneurial Identity · Temporal Stability · Entrepreneurial Experience · Entrepreneurial Success · Entrepreneurial Failure · Longitudinal

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✉ Ricardo Figueiredo Belchior  
ricardobelchior@iseg.ulisboa.pt

<sup>1</sup> Advance/CSG, Instituto Superior de Economia e Gestão, Universidade de Lisboa, Lisbon, Portugal

<sup>2</sup> CEGIST, Instituto Superior Técnico, Universidade de Lisboa, Lisbon, Portugal

## Introduction

Personal identity has been portrayed as a personality trait characteristic of a person (Turner et al., 1987). As individuals spend a considerable part of their lives working, unique work-related individual characteristics, group membership, and social roles can also generate a work identity (Miscenko & Day, 2016), such as an entrepreneurial identity. There has been a growing interest in entrepreneurial identity research (e.g., Farmer et al., 2011; Mmbaga et al., 2020; Radu-Lefebvre et al., 2021; Wagenschwanz, 2021). This research focus can be said to fit and contribute to decision-making theory within entrepreneurship (cf. Ferreira et al., 2019). According to Farmer et al. (2011, p. 245), “a person’s developing sense of self as an entrepreneur represents a powerful motivating force that can help explain why some individuals choose and continue to engage in entrepreneurial activity and why others do not.”

Possibly due to entrepreneurial identity being an “umbrella construct” (Radu-Lefebvre et al., 2021), the literature has offered many definitions for it. In this study, we adopt Wagenschwanz’s (2021, p. 64) encompassing definition of entrepreneurial identity as “the individual-level identity content and structure of a person who creates a new venture.” Farmer et al. (2011, p. 246) propose that entrepreneurial identity aspirations are “a possible but unrealized future entrepreneur self” and a “wanting to become a certain kind of person.”

Rooted in symbolic interactionism (Blumer, 1986; Mead, 1934; Stryker, 2017), role identity theory suggests that entrepreneurial identity is formed through personal agency and social discourse from interactions with others (Wagenschwanz, 2021). Individuals are exposed to different opportunities to express and validate their entrepreneurial identities in their social contexts. Thus, although identity may entail some degree of temporal stability, these social interactions and opportunities may have the potential to develop or change entrepreneurial identity aspirations. For example, Seibert et al. (2021) find that displacing work events (e.g., no raise, pay cut, ignored ideas, and organizational change) may amplify the relationship between entrepreneurial identity aspirations and entrepreneurial discovery behaviors. Stevenson et al. (2023) propose that daily variations in entrepreneurial identity may shape entrepreneurial behavior, and, perhaps, vice versa.

Other important potential sources of entrepreneurial identity-changing forces include exposure to entrepreneurship in the shape of entrepreneurial family members and role models (e.g., Newbery et al., 2018) and entrepreneurial experience through, for example, creating and working for a startup or assuming an intra-preneurial role in an established organization (Antoncic & Hisrich, 2001, 2003). Empirically, Farmer et al.’s (2011) and Obschonka et al.’s (2015) studies provided the first tests regarding the role of prior entrepreneurial experience in entrepreneurial identity. However, while the latter study found a positive relationship between these constructs, the former failed to find such an effect to be significant. Thus, although it is believed that entrepreneurial experience (and exposure) can shape an individual’s entrepreneurial identity, existing empirical evidence remains inconclusive, and hence more research is required.

Recent literature reviews on entrepreneurial identity (e.g., Mmbaga et al., 2020; Radu-Lefebvre et al., 2021; Wagenschwanz, 2021) identify the study of entrepreneurial identity formation, development, and evolution as underdeveloped and promising research subjects, especially when explored using longitudinal approaches. The few studies using longitudinal data to explore how entrepreneurial identity evolves support some level of temporal stability (e.g., Collewaert et al., 2016; Obschonka et al., 2015). Nonetheless, the dynamic identity approach suggests that individuals develop and revise their identities (Sveningsson & Alvesson, 2003). Although no general tendency has been found suggesting a specific direction, this evidence does not refute intra-individual change (e.g., Collewaert et al., 2016; O’Neil et al., 2022; Obschonka et al., 2015).

In addition to the scarce evidence related to the temporal stability of entrepreneurial identity (Wagenschwanz, 2021), how the success of entrepreneurial and intra-entrepreneurial experiences may reinforce or weaken such an identity remains unclear. Farmer et al. (2011) suggest that along with considering the quantity of prior entrepreneurial experiences, one should also account for the positive or negative quality of said experiences. Based on the results of a simulated entrepreneurial experience, Newbery et al. (2018) find that when feedback on this experience was positive, entrepreneurial identity salience increased, and vice versa. However, these results have not been confirmed by studying the effects of positive and negative real-life entrepreneurial experiences. Therefore, new, longitudinal approaches are required.

This paper proposes to fill this gap in the literature by applying quantitative methods to explore the following two research questions: *RQ1*) How do entrepreneurial identity aspirations evolve over time?; and *RQ2*) Do entrepreneurial experiences play a role in the evolution of entrepreneurial identity aspirations over time? Using an 11-year longitudinal research design and following Farmer et al. (2011), we propose a model in which current entrepreneurial identity is predicted by entrepreneurial identity 11 years before and where prior experiences in entrepreneurship mediate this relationship. We adopt a broader definition of entrepreneurial experience, including prior new business creation and paid employment in startups, and distinguish between experiences with a negative outcome (i.e., the organization stopped operating due to a lack of resources and/or financial problems) and a positive outcome (i.e., a non-negative experience).<sup>1</sup>

We test our hypotheses using structural equation modeling on a sample of individuals who were previously enrolled in a higher education program. We find that past entrepreneurial identity predicts identity 11 years later, as well as the likelihood of engaging in entrepreneurial experiences during this timeframe. Our results also suggest that prior entrepreneurial behavior plays an important role in determining current entrepreneurial identity. Generally, having created a new business or having had a paid position in a startup is associated with increased entrepreneurial identity. Additionally, we distinguish between the effects due to positive and negative entrepreneurial experiences. Results show that, while a positive new business creation experience appears to increase current identity, no significant weakening of identity

<sup>1</sup> Refer to "Measures" section for more details.

occurs when individuals experience a negative new business creation experience. This suggests that entrepreneurial identity has a degree of resilience to failure.

Our study on the temporal evolution of entrepreneurial identity makes a relevant contribution to the literature by providing empirical evidence in a growing field that lacks longitudinal quantitative analysis. Our work is also pertinent to entrepreneurship educators and policymakers as it shows the types of entrepreneurial experiences that may strengthen individuals' entrepreneurial identity and the activities that should be promoted. The adjustment of self and social identity-related entrepreneurship, along with the development of startup skills, will likely potentiate the frequency and quality of future entrepreneurial activity.

The remainder of this paper is organized as follows. First, we provide a literature review of the identities of entrepreneurs and the role played by entrepreneurial experience, serving as the foundation for our hypotheses. Next, the methodological section details the data collection process, construct measurement, and validity testing and discusses the longitudinal analytical methods applied. This is followed by the [Results](#) section, where we present our empirical findings. Subsequently, in the [Discussion](#) section, we elaborate and interpret our results and frame them in the relevant field. Finally, we conclude the study and provide the practical and theoretical implications of our findings and advance suggestions for future research.

## Literature review

### Entrepreneurial identity

Scholarly interest in entrepreneurial identity has increased in recent years. Evidence of this are the recent extensive reviews by Mmbaga et al. (2020), Radu-Lefebvre et al. (2021), and Wagenschwanz (2021), which identified hundreds of journal articles focused on identity in entrepreneurship, most of which have been published in the last decade. Entrepreneurial identity can help explain entrepreneurial behavior (e.g., Fauchart & Gruber, 2011; York et al., 2016; Zuzul & Tripsas, 2020) and is linked to important new venture decisions (e.g., Alsos et al., 2016; Mathias & Williams, 2017), time commitment (Murnieks et al., 2020), strategic responses and the ability to respond to adversity (Powell & Baker, 2014), opportunity evaluation (Fauchart & Gruber, 2011), resource acquisition (Kromidha & Robson, 2016), motivations (Cardon et al., 2009), behaviors (Powell & Baker, 2017), and related outcomes (e.g., Mathias & Williams, 2018; O'Neil & Ucbasaran, 2016). For these reasons, studying identity in entrepreneurship is important because it allows us to better understand these individuals and the firm-creation process.

Due to this rapid growth and there being multiple perspectives on identity (Wagenschwanz, 2021), many definitions of entrepreneurial identity have been proposed, and no consensus exists (Crosina, 2018). According to Hoang and Gimeno (2015), entrepreneurial identity refers to the set of values, beliefs, attitudes, and behaviors that enable a person to be in an entrepreneurial role. Wagenschwanz (2021, p. 64) added that entrepreneurs' identity "the individual-level identity content and structure of a person who creates a new venture." In our work, we focus on

entrepreneurial identity aspirations, which Farmer et al. (2011, p. 246) define as “a possible but unrealized future entrepreneur self.” Focusing on aspirations is relevant because aspiring for a possible identity may drive individuals’ thoughts and actions to achieve that identity (*e.g.*, Hoang & Gimeno, 2010; Oyserman et al., 2006).

Entrepreneurs differ from many other professionals (Mmbaga et al., 2020). Compared to several other occupations, individuals engaging in entrepreneurial behavior face higher levels of uncertainty and a more prevalent lack of structure (either professional or organizational), along with a lack of clear paths for progress and advancement in their careers (Crosina, 2018). Additionally, entrepreneurs often switch between different identities, be it during the day, across their careers, or during the duration of their business (Murnieks et al., 2014; Stevenson et al., 2023). The complexity of an entrepreneur’s identity is apparent when we consider that it may be comprised of different role identities, such as inventors, developers, or founders (Cardon et al., 2009); revolutionaries and discoverers (Zuzul & Tripsas, 2020); visionaries and scientists (Grimes, 2018); and/or Darwinians, communitarians, and missionaries (Fauchart & Gruber, 2011).

Given the relevance of entrepreneurial identity, understanding how it is formed, developed, and maintained is crucial. Regarding the temporal stability of identity, Miscenko and Day’s (2016) extensive review highlights two opposing perspectives: static and dynamic. Scholars who adopt the static work identity view support the view that changes are rare but may occur, for example, when formal role transitions occur (Conroy & O’Leary-Kelly, 2014; Ibarra, 1999) or when contextual influences lead to the modification of the content of roles (Chreim et al., 2007; Eriksson-Zetterquist et al., 2009). On the other hand, scholars in the field of dynamic work identities propose that work identity is naturally unstable and driven, in large part, by ever-changing environments (Alvesson, 2010). The dynamic identity approach relates to identity work in which individuals engage in processes of developing, maintaining, and revising their identities (Sveningsson & Alvesson, 2003). While seemingly incompatible, both perspectives appear to agree that, to different degrees, identities have both a stable and an unstable nature and can be shaped by either external or internal antecedents. Wagenschwanz (2021) states that little is known about the temporal stability of entrepreneurial identity and, along with, for example, Mmbaga et al. (2020), identifies many opportunities for future research in this area. Our work focuses on the development and maintenance of entrepreneurial identity aspirations over a long period, taking up the opportunity to fill this gap in the extant literature.

### Entrepreneurial identity temporal stability

Different definitions of entrepreneurial identity have led to different perspectives on how it evolves and is maintained. Radu-Lefebvre et al. (2021) identify two dominating conceptualizations of entrepreneurial identity: as property, and therefore mostly stable, or as process, drawing heavily from identity work theory (Alvesson et al., 2008; Snow & Anderson, 1987; Sveningsson & Alvesson, 2003), as a continuous and evolving accomplishment. Mmbaga et al. (2020, p. 15) also highlight identity variations “along a temporal spectrum, ranging from transient (Farmer et al., 2011; Shepherd &

Williams, 2018) to lifelong (García & Welter, 2013; Marlow & McAdam, 2015), and can change or arise as individuals navigate the entrepreneurship process.”

In this context, empirical insights have been obtained from recent qualitative studies. For example, Werthes et al. (2018) investigate the development of the identity of entrepreneurs in cultural or creative industries through longitudinal qualitative cases and find that self-reflection is an important force in the process. More recently, O’Neil et al. (2022) follow first-time sustainable founders for three years and find that they aligned their personal identities with an evolving founder identity, aiming for authenticity.

However, empirical evidence from quantitative longitudinal analyses indicates a certain level of temporal stability in entrepreneurial identities. Notably, Obschonka et al. (2015), using a 4-year time frame analysis and two samples of German scientists ( $n=122+117$ ), do not find a significant difference between individuals’ mean entrepreneurial identity in the first and final data collections. With a much smaller 10-month timeframe, Collewaert et al. (2016) also find stable entrepreneurial identity centrality for a sample of Belgian entrepreneurs in the founding stages of their venture ( $n=112$ ), although they describe the weakening of passion for founding over time.

Consistent with the identity work theory, Crosina (2018) and Jain et al. (2009) agree that entrepreneurial identity must be crafted and requires maintenance. Additionally, O’Neil et al. (2022) highlight that becoming an entrepreneur might imply a major and uncertain role transition (and therefore an identity change; Hoang & Gimeno, 2010) and that, if this transition is not properly managed, new ventures may fail or never come to fruition (Demetry, 2017). This leads to a possibly negative experience and an attenuated or, at best, reshaped entrepreneurial identity. Furthermore, displacing work events may amplify the relationship between entrepreneurial identity aspirations and entrepreneurial discovery behaviors (Seibert et al., 2021), since external forces test and reshape identities (Clarke & Holt, 2017).

### **Entrepreneurial experience—an antecedent of entrepreneurial identity change**

Prior startup experience has been associated with entry into entrepreneurship, opportunity exploration, and exploitation (*e.g.*, Amaral et al., 2011; Ucbasaran et al., 2009). Thus, entrepreneurial experience may also be an important internal factor that influences entrepreneurial identity. Using three samples of working adults from the United States, China, and Taiwan ( $n=167, 222, \text{ and } 174$ , respectively), Farmer et al. (2011) find insignificant correlations between prior startup experiences and entrepreneurial identity aspirations.<sup>2</sup> In contrast, Obschonka et al. (2015) find a positive relationship between past entrepreneurial behavior and the current entrepreneurial identity in two samples of German scientists ( $n=488, 496$ ). Notably, both findings were based on cross-sectional analyses.<sup>3</sup>

<sup>2</sup> Farmer et al.’s (2011) study focused mainly on how prior start-up experience can enhance the identity-behavior link.

<sup>3</sup> In Obschonka et al.’s (2015) study – which has a longitudinal data collection – past entrepreneurial behavior was only measured at the initial data collection, rather than specifically asking for any entrepreneurial events experienced between initial and final data collections. Thus, for the test of this specific hypothesis, their research design cannot be identified as longitudinal.

Addressing the issue of entrepreneurial experience quality, Newbery et al.'s (2018) research design proposes a process of entrepreneurial identity formation in which performance feedback helps individuals adjust the dissonance between idealized and experienced entrepreneurial behaviors. They study undergraduate students in a business simulation game ( $n=263+48$ ), in which players make several business decisions regarding a startup over 3 weeks (equivalent to 36 simulated months) and receive operational feedback on the startup's performance at each stage. They find that positive feedback led to an increase in entrepreneurial identity salience and that negative feedback led to a decrease in entrepreneurial identity salience. To the best of our knowledge, this is the only quantitative study that uses a longitudinal design to empirically test this experience-identity link. However, entrepreneurial experiences were based on the results of a 3-week simulated experience and not on real-life entrepreneurial experiences. A possible explanation for the role of entrepreneurial experience is that it helps individuals obtain a more tangible idea of what goes into being an entrepreneur and their roles (Hoang & Gimeno, 2010). Related to this, experience may also change an individual's self-efficacy beliefs and outcome expectations (Bandura, 1977, 1982; Lent & Brown, 2006) and has been found to moderate how entrepreneurial identity aspirations relate to startup behavior (*cf.* Farmer et al., 2011).

Entrepreneurial experience may arise from several sources, such as starting a new business, working for a startup, or even participating in or observing businesses owned by family members, close relatives, or friends (Farmer et al., 2011). Similarly, Newbery et al. (2018) suggest that role models are a source of entrepreneurship exposure. Arguably, a person may also acquire such exposure via intrapreneurship (Antoncic & Hisrich, 2001, 2003), as intrapreneurs will likely engage in innovation behavior that closely resembles that of entrepreneurship (*e.g.*, Åmo, 2010; Bouchard & Basso, 2011), and intrapreneurship has been found to promote subsequent entrepreneurial intentions and start-up activities (Bogatyreva et al., 2022).

## Hypotheses development and conceptual model

A recent review of the literature on entrepreneurial identity recognized its dynamic nature as an under-investigated research theme (Wagenschwanz, 2021). Specifically, it acknowledges the lack of exploration of the process of identity formation and change, finding very few articles that empirically explore its evolution with a longitudinal research design and data. We now summarize the literature most closely related to our studied hypotheses, as presented below.

Regarding the temporal stability of entrepreneurial identity, consistent with the conceptualization of the entrepreneurial identity property (Radu-Lefebvre et al., 2021) and the empirical evidence from Obschonka et al.'s (2015) and Collewaert et al.'s (2016), we propose the following hypothesis:

***Hypothesis 1:*** *Past entrepreneurial identity aspirations positively predict current entrepreneurial identity aspirations.*

Entrepreneurial identity has been proposed to explain subsequent behavior (Fauchart & Gruber, 2011; York et al., 2016; Zuzul & Tripsas, 2020), and empirical evidence supports its positive effect on entrepreneurial intention (e.g., Obschonka et al., 2015) and behavior (Farmer et al., 2011; Seibert et al., 2021). Thus, we propose the following hypothesis:

**Hypothesis 2:** *Past entrepreneurial identity aspirations positively predict subsequent entrepreneurial experiences.*

Given the critical role of activity-related experiences as a cognitive influence on career decisions (Bandura, 1977, 1982; Lent & Brown, 2006; Lent et al., 1994) and weak but positive empirical support (cf. Farmer et al., 2011; Obschonka et al., 2015), we posit a significant relationship between real-life entrepreneurial experience(s) and the salience of an individual's entrepreneurial identity. Furthermore, accepting Farmer et al.'s (2011) suggestion of considering the quality of experiences and attempting to expand the empirical evidence from Newbery et al.'s (2018) simulated experience, which pointed toward a symmetric effect we postulate that positive experiences will lead positively to building an entrepreneurial identity and negative experiences will reduce this identity. Therefore, the following two hypotheses are proposed:

**Hypothesis 3:** *A prior positive entrepreneurial experience will increase current entrepreneurial identity aspirations.*

**Hypothesis 4:** *A prior negative entrepreneurial experience will decrease current entrepreneurial identity aspirations.*

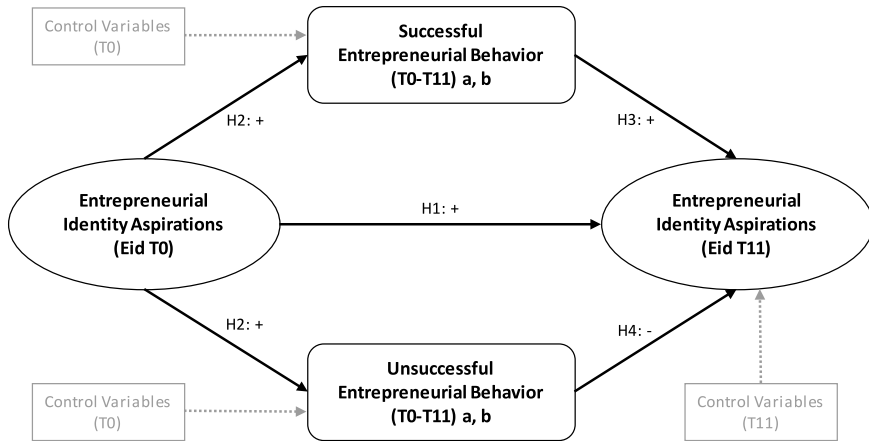
To the best of our knowledge, no previous studies have used quantitative methods to explore how entrepreneurial identity and identity aspirations evolve over the long term and how this evolution is mediated by real positive or negative startup experiences. We propose filling this gap by testing the conceptual model outlined in Fig. 1, along with our four hypotheses.

## Methodology

### Data

Based on a larger international research project, the *Entrepreneurship Education Project* (EEP) (cf. Vanevenhoven & Liguori, 2013), EEP Portugal collected five rounds of data from October 2010 to January 2022 to provide relationship-related information about Portuguese college students (cf. Belchior, 2019). This dataset has been used in several recent studies (Belchior & Lyons, 2021, 2022; Hance et al., 2019; Litzky et al., 2020; Vanevenhoven & Liguori, 2013). Both undergraduate and graduate students were invited to participate in the EEP Portugal web survey. Students from several higher education institutions participated, but respondents were mostly enrolled in business programs (36.20%), followed by a (broader and more





*a* identifies that a new business venture was created or cocreated within the period between T0 and T11.

*b* identifies that a new business venture was created or cocreated, or that a paid organizational employment was held in a new business project within the period between T0 and T11.

**Fig. 1** Study's conceptual model

inclusive) category designated by business and economics-related programs (*i.e.*, programs typically taught in business and economics schools/departments) (29.73%) and a residual category consisting of all other programs (34.07%).

EPP Portugal was designed as a longitudinal study, and our work is based on the responses from only two of its surveys, namely, from its 1st survey (T0: academic year of 2010/11) and its 5th survey (T11: 11 years later, during January 2022). The 1st wave survey resulted in 1,309 valid responses (respondents self-reported their current enrollment in a Portuguese higher education institution). E-mail invitations to an 18-min *Qualtrics* (Internet) survey were sent to 892 participants of the first wave survey who agreed to be contacted for follow-up surveys and whose e-mails did not bounce back (or, otherwise, could be contacted through LinkedIn). Finally, a final sample of 185 respondents participated in both the 1st and the 5th EPP Portugal follow-up surveys (20.7% response rate).

Both surveys were promoted by allowing participants to enter a raffle for prizes worth \$100 (USD) and 100€, respectively (via certificate gifts). Data were scanned for respondents who might have made multiple survey submissions to improve their winning odds. In all these cases, the most complete submission was retained, and all others were eliminated.

By choosing an 11-year interval, we aimed to study a relatively long period, increasing the likelihood of observing significant events (particularly those with the potential to change entrepreneurial identity aspirations). Arguably, with such potential, we were able to inquire about individuals before and after the peak socio-economic consequences of two major international crises: (1) the financial and sovereign debt crisis that raised Portugal's annual unemployment rate from 10.8% (in

2010) to 17.1% (in 2013)<sup>4</sup>; and (2) the COVID-19 pandemic, which reached 303 deaths/day at the end of January 2021<sup>5</sup> and dropped to a much lower level in the range of 10–50 deaths/day by January 2022. Thus, a longer period represents an advantage or, at least a complement, over previous longitudinal studies with shorter timeframes (e.g., the 4-year window of Obschonka et al., 2015). Analyses of the evolution of entrepreneurial identity and the influence of positive or negative entrepreneurial experiences over shorter periods are more likely to reveal stronger effects that may not persist over time. Issues of memory recall may arise when entrepreneurial experience is more temporally distant from the moment of data collection. Given the significance of such experiences and the objective criteria for categorizing their positive or negative qualities we posit that this will not significantly affect the results of this study.

### Follow-up survey attrition

Although high attrition from follow-up survey dropout is especially common in longitudinal research, nonrespondents can be a problem for empirical research (cf. Jelčić et al., 2009). Using the full dataset from the 1st wave survey and comparing nonrespondents to the 4th EEP Portugal survey (#1124) with respondents (T11, #185), we can report the following profile differences at that initial time (T0): *Gender* 42.24% vs. 41.08% man (z-test: p.=n.s.), *Age* 24.25 vs. 23.95 years (t-test: p.=n.s.), *Family entrepreneurial exposure* (i.e., parents/tutors, grandparents, or siblings, created a new business) 57.71% vs. 60.33% (z-test: p.=n.s.), and entrepreneurial identity aspirations [Eid(6-item avg.): the average of the six-item construct] 3.449 vs. 3.448 (t-test: p.=n.s.). Therefore, we found no evidence of meaningful differences between the two groups in the study's variables or constructs. However, given that the EEP Portugal survey theme is quite evident, some self-selection likely occurred, favoring those with relevant entrepreneurial experience.

## Measures

### Dependent and independent variables and constructs

This study focuses on the interplay between entrepreneurial identity, entrepreneurial behavior, and exposure at the intra-individual level.

*Entrepreneurial identity* (Eid) was measured based on Farmer et al.'s (2011) entrepreneurial identity aspirations construct with six items rated on a five-point Likert scale (ranging from 1 = strongly disagree to 5 = strongly agree). Included items are: (1) "I often think about becoming an entrepreneur," (2) "I would like to see myself as an entrepreneur," (3) "Becoming an entrepreneur is an important part of who I am," (4) "When I think about it, the term 'entrepreneur' would fit

<sup>4</sup> Source: [https://www.pordata.pt/Portugal/Taxa+de+desemprego+total+e+por+sexo+\(percentagem\)-550](https://www.pordata.pt/Portugal/Taxa+de+desemprego+total+e+por+sexo+(percentagem)-550)

<sup>5</sup> Source: <https://covid19.min-saude.pt/relatorio-de-situacao/>

me pretty well,” (5) “I am always thinking about becoming an entrepreneur,” and (6) “It is important for me to express my entrepreneurial aspirations.”

*Entrepreneurial Behaviors* were measured using dummy variables in several ways to add robustness and insight. These conceptualizations resulted from combining answers to the following questions, adapted from DeTienne and Chandler (2007) and EEP Portugal and international project surveys (Belchior, 2019; Vanevenhoven & Liguori, 2013):

Questions 6 & 7 (T11): “Regarding your experience as an entrepreneur, indicate all entrepreneurial projects you have created (alone or with others) and that: [Q6] a) have created wealth, indicating in which industry this project was inserted, on what date it was created and on what date it ceased to be part of that project (if applicable); [Q7] b) have not been successful, indicating in which industry this project was inserted, on what date was created and on what date it ceased to be part of this project. Note: It is understood as being in this situation the projects that had to stop operating, as organizations, due to lack of resources and/or financial problems, which excludes the sale, merger and termination of operations because there are better alternatives.”

Question 9 (T11): “We are interested in your entrepreneurial experience as an employee. Have you ever held a paid position in a new company or a new business project? (1= ‘Yes’, 0= ‘No’) Please list the start date(s) and end date(s) (if applicable) of these experiences below. (...) has any of these experiences involved a failed business project? (1= ‘Yes’, 0= ‘No’). Note: It is understood as being in this situation the project that had to stop operating, as an organization, due to lack of resources and/or financial problems, which excludes the sale, merger and termination of operations because there are better alternatives.”

Thus, *Entrepreneurial Behavior (T0-T11)a* indicates that a new business venture was created or cocreated between T0 and T11 (1= “Yes,” 0= “No,” irrespective of success). *Successful Entrepreneurial Behavior (T0-T11)a* identifies that the individual reported that no failed business venture existed during this period (1= “Yes, no failure existed”) and *Unsuccessful Entrepreneurial Behavior (T0-T11)a* otherwise.

*Entrepreneurial Behavior (T0-T11)b* indicates that a new business venture was created or cocreated or the individual held paid organizational employment in a new business project between T0 and T11 (1= “Yes,” 0= “No,” irrespective of success). *Successful Entrepreneurial Behavior (T0-T11)b* identifies that the individual reported that no failed business venture existed during this period in other situations (1= “Yes, no failure existed”) and *Unsuccessful Entrepreneurial Behavior (T0-T11)b* otherwise.

## Controls

Following Farmer et al.’s (2011) study on entrepreneurial identity aspirations and for additional robustness of our study’s results, we controlled for the effect of some demographic variables. Namely, all the results on our dependent variables were

controlled for: *Gender* (male = 1, female = 0), *Age* (years old in T11), and *Family Entrepreneurial Exposure* (classified with “1” if parents/tutors, siblings, or grandparents had new exposure to new business creation and “0” otherwise; before T0 and between T0 and T11). To predict Entrepreneurial Identity (T11), we also controlled for *Work Experience* (years in T11) and highest completed *Educational Level* (in T11, with 1 = compulsory basic education, 2 = secondary education, 3 = licentiate/bachelor’s degree, 4 = postgraduate or specialization course, 5 = masters, 6 = doctorate).

### Common method bias

Consistent with the suggestions of Podsakoff et al. (2003), we implemented some *procedural remedies* to reduce method variance when designing our survey. The large temporal lag between self-reported Eid(T0) and Eid(T11) and the objectivity implicit in the self-reported entrepreneurial behavior (T0-T11) variables make our dependent and independent variables much less likely to be biased by “consistency motifs, implicit theories, social desirability tendencies, dispositional and transient mood states, and any tendencies on the part of the rater to acquiesce or respond in a lenient manner” (p. 887). We also used different response formats (e.g., Likert-type scales, multiple-choice, and open-ended questions) and question randomization within the Eid construct, therefore reducing method biases caused by commonalities in scale endpoints and anchoring bias. Although EEP Portugal surveys are not anonymous, due to the need to link survey responses longitudinally, respondent anonymity was suggested by referring to the fact that their answers would only be analyzed in their aggregated and anonymous form. Respondents were also explicitly informed that their answers were equally important, regardless of whether they were more or less entrepreneurial. These procedures were expected to reduce respondents’ evaluation apprehension and social desirability tendencies, both of which are sources of method-based variation.

### Method

To test our hypotheses, we used the partial least squares approach for structural equation modelling (PLS-SEM), with SmartPLS software (v3.3.7) (Ringle et al., 2015). PLS-SEM is a variance-based SEM that is robust in the absence of multivariate normality and appropriate for models that include latent variables (Hair et al., 2022). Consistent with current best practices, a two-step approach was employed, in which we first validated our measures (outer model) and then tested our hypothesized model (inner model). The inner model was calculated using a Consistent PLS algorithm and Bias-Corrected and Accelerated Bootstrap (5000 samples). According to Manley et al. (2021), PLS-SEM is an appropriate model for entrepreneurship studies and has been used extensively in this particular context.

## Results

### Preliminary analysis

#### Descriptive statistics and correlations among study constructs

Four key variables/constructs were included in our study: *Entrepreneurial identity aspirations* (Eid T0 and T11) and *Entrepreneurial Behavior*<sub>a, b</sub> and its subdivision into *Successful Entrepreneurial Behavior*<sub>a, b</sub> and *Unsuccessful Entrepreneurial Behavior*<sub>a, b</sub>; however, these are eight if we consider their different timeframes and alternative conceptualizations (refer to "Measures" section for conceptualizations *a* and *b*). Table 1 presents the sample size, minimum, maximum, mean, standard deviation, and Pearson correlations among all key and control variables: *Gender*, *Family Entrepreneurial Exposure* (prior to T0 and between T0 and T11), *Age*, *Work Experience*, and *Educational Level*. The results in this table show *Gender* is the most relevant control variable, with a significant positive linear relationship with all key variables. These results indicate that men are more likely to display higher levels of Eid ( $r = [0.189, 0.228]$ ,  $p. < [0.01]$ ) and engage in entrepreneurial behaviors more frequently ( $r = [0.172, 0.350]$ ,  $p. < [0.05, 0.001]$ ). It is noteworthy that having a *Family with Entrepreneurial Exposure (prior to T0)*, *Age*, and *Work Experience* were all positively associated with Eid (both at T0 and T11), while *Educational Level* was negatively associated with Eid(T11). Relatively to the latter result, we need to highlight that all the 1st EEP Portugal survey respondents were students enrolled in higher education programs.

Addressing our hypotheses, Table 1 provides confirmatory evidence for H1, with Eid(T0) and Eid(T11) moderately positively correlated ( $r = 0.447$ ,  $p. < 0.001$ ), and for H2 with results displaying a weak positive correlation between Eid(T0) and *Entrepreneurial Behavior (T0-T11)*. However, this remains statistically significant ( $r = [0.167, 0.289]$ ,  $p. < [0.05, 0.001]$ ) and robust across the various conceptualization of the latter variable. H3a was also supported this correlation analysis, with *Successful Entrepreneurial Behavior*<sub>a, b</sub> moderately positively correlated with Eid(T11) ( $r = [0.417, 0.469]$ ,  $p. < 0.001$ ). Unlike our prediction regarding H3b, *Unsuccessful Entrepreneurial Behavior*<sub>a, b</sub> was not negatively associated with subsequent Eid(T11). Rather, it was found to display a weak significantly positive association ( $r = [0.167, 0.256]$ ,  $p. < [0.05, 0.01]$ ).

By analyzing the differences between the 6-item averages of Eid(T0) and Eid(T11) at the intra-individual level, we found that most individuals had decreased their Eid over the 11-year period. That is, a change of -0.2580 from an initial mean Eid(T0) of 3.448 to a later mean Eid(T11) of 3.190 (on a 1–5 scale). An exception to this is the case of individuals who had entrepreneurial experience during this period, who not only had a higher Eid but also evolved to increase it slightly. Explicitly, the 45 recent (last 11 years) entrepreneurs reported an initial mean Eid(T0) of 3.837 and a final mean Eid(T11) of 3.926, while those not included in this category (*Entrepreneurial Behavior (T0-T11)a*) reported initial mean Eid(T0) and a final mean Eid(T11) of 3.288 and 2.920, respectively.

Table 1 Descriptive statistics

Variables and Constructs	n	Min	Max	Mean	Std Dev.	Pearson Correlations				
						1.	2.	3.	4.	5.
1. Gender (Man)	185	0	1	0.41	0.49	1				
2. Family Entrep. Exposure (Prior to T0)	184	0	1	0.6	0.49	-0.073	1			
3. Age (T11) (Years)	185	29	64	35.18	5.99	0.042	0.13	1		
4. Work Experience (T11) (Years)	157	2	52	12.41	7.41	0.004	0.179*	0.884***	1	
5. Educational level (T11)	157	2	6	4.27	1.02	-0.134	-0.088	-0.119	-0.174*	1
6. Family Entrepreneurial Exposure (T0-T11)	149	0	1	0.21	0.41	0.005	-0.046	0.142	0.103	0.012
7. Entrepreneurial Behavior (T0-T11) a	177	0	1	0.25	0.44	0.350***	0.077	0.082	0.066	0.073
8. Entrepreneurial Behavior (T0-T11) b	140	0	1	0.43	0.5	0.268**	0.125	0.072	0.075	0.013
9. Successful Entrepreneurial Behavior (T0-T11) a	177	0	1	0.21	0.41	0.337***	0.031	0.125	0.105	0.091
10. Successful Entrepreneurial Behavior (T0-T11) b	137	0	1	0.37	0.49	0.238**	0.079	0.123	0.111	0.001
11. Unsuccessful Entrepreneurial Behavior (T0-T11) a	176	0	1	0.09	0.28	0.172*	0.083	0.001	-0.011	-0.043
12. Unsuccessful Entrepreneurial Behavior (T0-T11) b	118	0	1	0.16	0.37	0.234*	0.142	0.01	0	-0.001
13. Entrepreneurial Identity Aspiration (Eid_T0)	185	-2.51	1.77	0	1	0.189**	0.183*	0.099	0.182*	-0.021
14. Entrepreneurial Identity Aspiration (Eid_T11)	185	-2.1	1.89	0	1	0.228**	0.242**	0.183*	0.257**	-0.167*

Table 1 (continued)

Variables and Constructs	Pearson Correlations													
	6.	7.	8.	9.	10.	11.	12.	13.	14.					
1. Gender (Man)	1													
2. Family Entrep. Exposure (Prior to T0)	0.026	1												
3. Age (T11) (Years)	0.019	0.795***	1											
4. Work Experience (T11) (Years)	0.005	0.895***	0.705***	1										
5. Educational level (T11)	0	0.748***	0.912***	0.805***	1									
6. Family Entrepreneurial Exposure (T0-T11)	-0.033	0.529***	0.405***	0.285***	0.265***	1								
7. Entrepreneurial Behavior (T0-T11) a	-0.037	0.640***	0.636***	0.399***	0.391***	0.871***	1							
8. Entrepreneurial Behavior (T0-T11) b	0.031	0.288***	0.289**	0.267***	0.246**	0.167*	0.256**	1						
9. Successful Entrepreneurial Behavior (T0-T11) a	0.043	0.454***	0.433***	0.469***	0.417***	0.231**	0.355***	0.447***	1					
10. Successful Entrepreneurial Behavior (T0-T11) b														
11. Unsuccessful Entrepreneurial Behavior (T0-T11) a														
12. Unsuccessful Entrepreneurial Behavior (T0-T11) b														
13. Entrepreneurial Identity Aspiration (Eid_T0)														
14. Entrepreneurial Identity Aspiration (Eid_T11)														

Std. betas coefficients significance (2-tailed), \*p. < .05; \*\*p. < .01; \*\*\*p. < .001

Entrepreneurial Behavior (T0-T11) a, considers all new business ventures created or cocreated (irrespectively of success)

Entrepreneurial Behavior (T0-T11) b, considers all new business ventures created or cocreated and paid organizational employment in a new business project (all irrespec-  
tively of success)

However, the relationship between identity aspirations and subsequent behavior is not definite, and our results support this proposition. Six cases (13.33%) can be found in our sample where later entrepreneurs had previously reported Eid 6-item averages below the Eid scale midpoint (*i.e.*, <3.0). This includes one case where the average was only one scale point above its minimum value (*i.e.*, 2), reflecting a previous lack of aspiration for entrepreneurial identity. Concurrently, among those not included in this category, we also identified 81 cases (61.36%) where the Eid 6-item average was above the scale midpoint, including six cases (4.55%) where the average was the maximum possible scale value (*i.e.*, 5).

We also briefly report relevant differences across *Gender* and *Age*. While the mean Eid already differed by gender in the first survey, with women reporting lower Eid levels than men (T0: 3.31 vs. 3.64), interestingly, this difference has not subsided and has even increased slightly 11 years later (T11: 3.00 vs. 3.46). Thus, we observed that women decreased their Eid more than men did (Eid mean changes of -0.3095 vs. -0.1842, respectively) (*i.e.*, 90.63% vs. 95.05% of the initial value at T0). Regarding the Eid of younger and older individuals (younger: < 34 years old; the median). Conversely, in the first survey, younger college students had a slightly higher Eid (T0: 3.46 vs. 3.43, respectively). Moreover, the fact that 11 years later older individuals had the highest Eid (T0: 3.09 vs. 3.29) suggests that the relationship between Eid levels and age is not linear. Younger individuals were, then, those who decreased the most in terms of their Eid, when compared with their older counterparts (Eid mean changes of -0.3739 vs. -0.1434).

### Entrepreneurial Behaviors between initial (T0) and final (T11) surveys

Regarding entrepreneurial behavior, from the 177 valid reports on this question, we found that 45 (25.4%) individuals engaged in entrepreneurial projects created by them alone or with others during the 11-year timeframe (*i.e.*, *Entrepreneurial Behavior (T0-T11)<sub>a</sub>*). Of these, 29 individuals reported (all) their business venture(s) as value-creating, six individuals reported (all) their business venture(s) as having failed due to a lack of resources and/or financial problems and nine reported having experienced both.

Opening the entrepreneurial behavior conceptualization to include exposure to entrepreneurial contexts as a paid organizational employee in a new business project, where entrepreneurial behaviors are assumed to be required, we amplify the number of relevant cases as follows. Of the 132 individuals who had not been engaged in entrepreneurial projects during this 11-year timeframe, 15 reported that they had this type of paid organizational employment. Of these, 12 individuals reported (all) these projects as value-creating, and three as having failed due to a lack of resources and/or financial problems. Thus, in the case of the more inclusive *Entrepreneurial Behavior (T0-T11)<sub>b</sub>* variable, 60 individuals were identified as behaving entrepreneurially within this timeframe, of which 41 with value-creating experiences, 9 having experienced failure, and 9 having experienced both.

Readers can refer to Table 1 for confirmation and additional information on our study's constructs and variables.



## Measurement model

The results of the (outer) measurement model suggest the adequacy of the originally proposed unifactorial structures of Eid(T0) and Eid(T11), construct reliability, and convergent and discriminant validity.

To evaluate the factorial structure, an initial exploratory factor analysis was performed using the principal component extraction estimation method and oblimin rotation. Eid(T0) and Eid(T11) were both consistent with the proposed unifactorial structure, with single factors accounting for 72.19% and 74.87% of the item's cumulative variance, respectively, and adequacy results of KMO=0.89 and 0.90, and Bartlett's test of sphericity(df)=822.948 (15) and 892.527 (15) (p. <0.001).

Regarding construct reliability, Cronbach's alpha and composite reliabilities were all well above the threshold (*i.e.* >0.70; Manley et al., 2021). Eid(T0) with 0.923 and 0.922, and Eid(T11) with 0.923 and 0.923. The convergent validity threshold of AVE > 0.50 (Manley et al., 2021) was also met with Eid(T0) and Eid(T11), with AVE of 0.705 and 0.706, respectively.

Regarding convergent and discriminant validity, we deleted one item (out of six) from the Eid construct given that the std. loading of item two was far below the recommended threshold of 0.70 (Manley et al., 2021), with a loading of 0.423. To maintain construct integrity longitudinally and reduce the possibility of methodological reasons for longitudinal differences, this change was also performed for Eid(T11). Regarding discriminant validity, using the recommended HTMT criterion between two reflective constructs below 0.90 (Hair et al., 2022; Henseler et al., 2015), discriminant validity has been established with a low HTMT value of 0.484 for the pair of Eid constructs.

## Structural models and hypotheses testing

After verifying the psychometric properties of our measurement model, we tested our hypotheses using four structural models. An initial model, Model 1, comprising the control variables *Gender*, *Age*, *Work Experience*, *Educational Level*, and *Family Entrepreneurial Exposure* and the dependent variable Eid(T11), was also included in our study. Model 1 provides a robust setting for testing the relevance of our key predictors when compared with the demographic variables commonly used in entrepreneurial cognition and behavior models. Model 2, the first to test Eid(T0) as an independent variable explaining Eid(T11), was the first model of interest to test H1. Models 3a and 3b, as subsequent models, add robustness to the previous results, given the exploration<sup>6</sup> of *Entrepreneurial Behavior (T0-T11)<sub>a, b</sub>* as a concurrent predictor of Eid(T11), but also provide a first test for H2 by assessing the effect of Eid(T0) on *Entrepreneurial Behavior (T0-T11)*. These two variants of Model 3

<sup>6</sup> This relationship is not predicted in our hypothesis because we have proposed differential (opposing) effects on the relationship between *Entrepreneurial Behavior (T0-T11)<sub>a, b</sub>* and Eid(T11), depending on whether the former was successful or a failure. However, we did not exclude the possibility of a net significant positive relationship between both variables and thus have included it in Model 3.

are structurally the same and differ only in the stricter conceptualization provided by *Entrepreneurial Behavior (T0-T11)<sub>a</sub>* and the looser conceptualization provided by *Entrepreneurial Behavior (T0-T11)<sub>b</sub>*. Models 4a and 4b add the success/failure dimension to the inquiry on entrepreneurial experience and, therefore, are the only models enabling a test of H3 and H4, which propose different effects of entrepreneurial successes and failures on subsequent Eid(T11).

All tested models were deemed appropriate, given the theoretical support and the resulting statistical goodness-of-fit, as measured by standardized root mean square residual SRMR = [0.04, 0.05], well below the threshold of SRMR < 0.08 (Hair et al., 2022). Our tested models had no missing values, given that they were replaced in SmartPLS software using the *mean value replacement* method. Although our data (n = 185) did not have missing values on the Eid(T0) and Eid(T11) constructs and 177 respondents provided information relative to their *Entrepreneurial Behavior (T0-T11)<sub>a</sub>*, some cases had additional missing data regarding the control variables and the alternative *Entrepreneurial Behavior (T0-T11)<sub>b</sub>* measure (also including paid organizational employment in a new business project). Thus, and for added robustness, we highlighted where the results would differ when using the alternative *casewise deletion* method to handle missing data. A summary of the results of our study can be found in Table 2 and will now be addressed.

Confirming our previous results from the correlation analysis, from Model 1, we confirmed *Gender* as the most statistically significant control variable with a positive association ( $\beta = 0.233$ ,  $p = 0.002$ ) with the dependent variable Eid(T11), followed by *Work Experience (T11)* ( $\beta = 0.343$ ,  $p = 0.014$ ). However, both effects are considered small ( $f^2 < 0.15$ ) (cf. Manley et al., 2021), and the overall explanatory power of the model is low, with Eid(T11)  $R^2$  adjusted of only 10.7%. Neither *Age*, *Educational Level (T11)* nor *Family Entrepreneurial Exposure (T0-T11)* were found to be significant predictors of Eid(T11).

Model 2 provides supporting evidence to our first hypothesis (H1), proposing temporal stability (or, at least, path dependency) of entrepreneurial identity aspirations, with the effect of Eid(T0) on the dependent variable Eid(T11) being statistically significant ( $\beta = 0.442$ ,  $p = 0.000$ ) and displaying a relevant (medium) effect size ( $f^2 = 0.249$ ). Comparing this model with base Model 1, Eid(T11)  $R^2$  adjusted greatly improves from 10.7% to 28.0%.

Regarding Model 3 and the test of our second hypothesis (H2), we found that Eid(T0) was significantly associated with the dependent variable *Entrepreneurial Behavior (T0-T11)*. Be it through its most strict conceptualization on Model 3a with *Entrepreneurial Behavior (T0-T11)<sub>a</sub>* ( $\beta = 0.223$ ,  $p = 0.001$ ) or with Model 3b, also including organization employment in startups, through *Entrepreneurial Behavior (T0-T11)<sub>b</sub>* ( $\beta = 0.217$ ,  $p = 0.008$ ). However, in both cases, small effect sizes were identified ( $f^2 = 0.055$  and 0.49, respectively). These results support H2, which links prior entrepreneurial identity to subsequent entrepreneurial actions/experiences. Specifically, we found a significant positive net effect of *Entrepreneurial Behavior (T0-T11)* on Eid(T11) (Model 3a:  $\beta = 0.359$ ,  $p = 0.000$ ; Model 3b:  $\beta = 0.281$ ,  $p = 0.000$ ) with comparable effect size in the case of the strictest conceptualization ( $f^2 = 0.176$ ) to that from Eid(T0) ( $f^2 = 0.177$ ), but lower in Model 3b ( $f^2 = 0.112$ ). The explanatory power of the model is low, with an *Entrepreneurial Behavior (T0-T11)<sub>a</sub>*

Table 2 PLS-SEM results from our hypotheses testing (n = 185)

Standardized effects between variables in the models	Model 1	Model 2	Model 3 a)	Model 3 b)	Model 4 a)		Model 4 b)	
					Successful EB(T0-T1)	Unsuccessful EB(T0-T1)	Successful EB(T0-T1)	Unsuccessful EB(T0-T1)
<i>Controls</i>								
Gender (Man) => Entrepreneurial Behavior (T0-T1) a, b	0.233**	0.141*	0.029	0.086	0.020	0.148*	0.169*	0.158*
Age (Years) => Entrepreneurial Behavior (T0-T1) a, b	-0.128	0.001	-0.031	-0.010	-0.071	-0.027	0.080	-0.030
Family Entrep. Exposure (BeforeT0) => Entrep. Behavior (T0-T1) a, b	0.343*	0.158	0.172	0.157	0.170	0.071	0.036	0.096
Gender (Man) => Eid(T1)								
Age (Years) => Eid(T1)								
Work Experience (Years) => Eid(T1)								
Educational level => Eid(T1)								
Family Entrepreneurial Exposure (T0-T1) => Eid(T1)								
<i>Hypothesized effects</i>								
H1: Eid(T0) => Eid(T1)			0.354***	0.376***	0.353***		0.367***	
H2: Eid(T0) => Entrepreneurial Behavior (T0-T1) a, b			0.223**	0.217**	0.210**	0.129	0.184*	0.178*
H3, H4: Entrepreneurial Behavior (T0-T1) a, b => Eid(T1)			0.359***	0.281***	0.371***	0.065	0.244**	0.128
Entrepreneurial Behavior (T0-T1) a, b - R <sup>2</sup>		30.0%	17.50%	11.60%	16.20%	5.20%	8.90%	8.00%
Entrepreneurial Behavior (T0-T1) a, b - R <sup>2</sup> Adjusted		27.7%	15.60%	9.60%	14.30%	3.10%	6.80%	5.90%
Eid(T1) - R <sup>2</sup>	13.1%	30.0%	40.70%	37.40%	42.80%		38.70%	

**Table 2** PLS-SEM results from our hypotheses testing (n = 185)

Standardized effects between variables in the models	Model 1		Model 2		Model 3 a)		Model 3 b)		Model 4 a)		Model 4 b)	
	Successful EB(T0-T1)	Unsuccessful EB(T0-T1)	Successful EB(T0-T1)	Unsuccessful EB(T0-T1)	Successful EB(T0-T1)	Unsuccessful EB(T0-T1)	Successful EB(T0-T1)	Unsuccessful EB(T0-T1)	Successful EB(T0-T1)	Unsuccessful EB(T0-T1)	Successful EB(T0-T1)	Unsuccessful EB(T0-T1)
<b>Eid(T11) - R<sup>2</sup> Adjusted</b>	<b>10.7%</b>	<b>27.7%</b>	<b>38.40%</b>	<b>34.90%</b>	<b>40.20%</b>	<b>35.90%</b>	185	185	185	185	185	185
n	0.047	0.042	0.041	0.038	0.045	0.042	199,897	245,861	233,234	208,985	257,858	225,591
SRMR	0.834	0.864	0.878	0.889	0.868	0.883						
Chi-Square												
NFI												

Std. betas coefficients significance (2-tailed), \*p. < .05; \*\*p. < .01; \*\*\*p. < .001. Sample size n = 185

Results based on a sample of #185 students, who participated in both the EEP Portugal surveys of academic years of 2010/11 and 2021/22

Entrepreneurial Behavior (T0-T1) conceptualization had two different configurations, from the most strict to the most inclusive conceptualization, namely: a) the former including only new business venture creation; and b) the latter including both having created a new business venture creation and having been a paid employee in a new business project

Values highlighted in bold correspond to the main results including those related with the tested hypotheses

R<sup>2</sup> adjusted to 15.6% and an *Entrepreneurial Behavior (T0-T11)*<sub>b</sub> R<sup>2</sup> adjusted of only 9.6%. Controls alone (significantly, gender) already accounted for an R<sup>2</sup> adjusted of 11.5% and 5.7%, respectively. Regarding the robustness of our H1 findings, tested in Model 2, this model maintains as statistically significant the effect from Eid(T0) to Eid(T11) (Model 3a:  $\beta=0.354$ ,  $p=0.000$ ; Model 3b:  $\beta=0.376$ ,  $p=0.000$ ), leading to considerably improved R<sup>2</sup> adjusted, from 28.0% to 38.4/34.9% (Models 3a and 3b, respectively).

Finally, with Model 4, we tested H3 and H4, proposing that prior entrepreneurial success would lead to higher entrepreneurial identity aspirations and prior failure would lead to lower entrepreneurial identity aspirations, respectively.

We found empirical support for H3, given the significant positive effect of *Successful Entrepreneurial Behavior (T0-T11)* on Eid(T11) (Model 4a:  $\beta=0.371$ ,  $p.=0.000$ ) (Model 4b:  $\beta=0.244$ ,  $p.=0.001$ ). Again, stricter Model 4a showed comparable effect sizes to those from Eid(T0) ( $f^2=0.186$  vs.  $f^2=0.182$ ), but was considerably smaller in its loosest conceptualization in Model 4b ( $f^2=0.082$  vs.  $f^2=0.183$ ). Thus, as expected, successful entrepreneurial behaviors seem to raise individuals' entrepreneurial identity aspirations.

Unlike our proposition, we did not find empirical support for H4 given the lack of a significant negative effect of *Unsuccessful Entrepreneurial Behavior (T0-T11)* on Eid(T11). All models show the opposite effect direction, with a non-significant positive influence (Model 4a:  $\beta=0.065$ ,  $p.=0.282$ ; Model 4b:  $\beta=0.128$ ,  $p.=0.071$ ). In this particular case, a different choice for managing missing values would have resulted in Model 4b displaying a borderline significant positive effect (Model\* 4b:  $\beta=0.195$ ,  $p.=0.049$ ,  $f^2=0.050$ ). Thus, against our initial prediction but compatible with the significant positive net effect of entrepreneurial behaviors on Eid(T11) found in Model 3, unsuccessful entrepreneurial behaviors either do not affect individuals' entrepreneurial identity aspirations or may actually raise them in the case of a less strict conceptualization of *Entrepreneurial Behavior (T0-T11)*, where failure may have been experienced as a new business project employee, rather than as a business owner.

H1 findings remain robust also in this final model, with the effect from Eid(T0) to Eid(T11), maintaining its statistical significance (Model 4a:  $\beta=0.353$ ,  $p.=0.000$ ) (Model 4b:  $\beta=0.367$ ,  $p.=0.000$ ) and leading to a small improvement of Eid(T11) R<sup>2</sup> adjusted, from 38.4/40.2% to 34.90/35.90% (Models 4a and 4b, respectively).

## Discussion

Unique individual characteristics related to work, group membership, and social roles can generate a work identity (Miscenko & Day, 2016). Entrepreneurial identity, as a developing sense of self as an entrepreneur, is a powerful motivating force that can help explain entrepreneurial activities (Farmer et al., 2011). Although this requires some degree of temporal stability for the self or others to recognize these characteristics as forming a congruent and distinct being, entrepreneurial identity has the potential to evolve. Role identity theory suggests that personal agency and

social discourse form an entrepreneurial identity by exposing individuals to different opportunities to express and validate it (Farmer et al., 2011; Wagenschwanz, 2021).

Empirical support has been found for both entrepreneurial identity stability and change. However, much remains to be known about the degree of change and change-triggering conditions. In fact, despite the recent and growing interest in this topic, recent literature reviews have identified a shortage of research analyzing its temporal stability (Mmbaga et al., 2020; Radu-Lefebvre et al., 2021; Wagenschwanz, 2021). This study's findings address this gap in four different (but complementary) ways: by (1) providing a detailed description of evolving entrepreneurial identity aspirations of 185 individuals (former higher education students in Portugal), over an extended period of 11 years (*Preliminary analysis*); (2) testing and quantifying its temporal stability (*Hypothesis 1*); (3) assessing its association with the likelihood of subsequent entrepreneurial experiences (*Hypothesis 2*); and (4) testing the potential differential effects from entrepreneurial experiences successes (*Hypothesis 3*) and failures (*Hypothesis 4*) on individuals' entrepreneurial identity aspirations.

The results of our preliminary analysis show an overall tendency for a slight decrease in entrepreneurial identity aspirations over this 11-year period. Whether this is due to contextual and locally specific circumstances (Scheu & Kuckertz, 2023) or a general trend that holds true across regions, only future research can tell. Significantly, given that the mean age of respondents has evolved within the age interval with the highest expected early-stage entrepreneurial activity (TEA) (Caetano, 2014), this may suggest that entrepreneurial identity aspirations may peak at an earlier stage<sup>7</sup> than the peak in TEA. Additionally, younger individuals saw their aspirations for entrepreneurial identity decrease at a faster rate (more than double) than their older colleagues. However, an exception to this general tendency was found among individuals with entrepreneurial experiences during this period. They started with a higher level of entrepreneurial identity aspirations and continued to increase it further.

Our findings also identify men as having higher levels of entrepreneurial identity aspirations and being more frequently engaged in entrepreneurial behaviors. Furthermore, regarding the general tendency of decreased aspirations in our sample, we observed that women decreased their entrepreneurial identity aspirations at a faster pace than men. These results are consistent with *ex ante* literature (e.g., Bosma et al., 2021; Farmer et al., 2011; Liguori, 2012; Pfeifer et al., 2016; Schlaegel & Koenig, 2014; Thompson & Kwong, 2016). Proposed as a male-dominant stereotype, the condition of being an entrepreneur often leads women to face conflicts between their gender and entrepreneurial identities (Greene & Brush, 2018; Mmbaga et al., 2020; Radu-Lefebvre et al., 2021). Well-known differences in intentions and startup activity levels may be rooted well before the eventual increased resource access barriers are met. As Farmer et al. (2011) have found for the United States, China, and Taiwan, we found that, for Portugal, on average, women may be less likely to act entrepreneurially due to their reduced level of entrepreneurial

<sup>7</sup> Especially considering that the previous age category had a lower TEA than the age category immediately above.

identity aspirations. Regarding the inconsistent results (across methods) on the positive association between *Age* and *Work Experience* and entrepreneurial identity aspirations and its negative association with *Educational Level*. Comparing these with Farmer et al., and and's (2011, p. 257) own inconsistent results (across subsamples/countries), it appears that these associations may not be linear or culturally bounded, but only future research can clarify this.

Note that these results mask intra-individual variations that do not meet these general tendencies. That is, we found a few individuals who became entrepreneurs and had previously reported a lack of aspiration for an entrepreneurial identity. However, we also found some individuals reporting the highest levels of identity aspirations that did not report any new business creation projects or had paid organizational employment in one. Although not completely coherent, clearly not all entrepreneurs create their own businesses because this is their defining identity. Furthermore, others may aspire to be entrepreneurs but have not yet found an opportunity to do so or have found the opportunity to express their entrepreneurial identity role in organizational employment.

Concerning all entrepreneurial behaviors reported during this 11-year longitudinal study, we found that approximately one in four individuals created their entrepreneurial project. Of these, 29 individuals reported successful value creation, six reported that their business venture had failed due to a lack of resources and/or financial problems and nine reported having experienced both. By opening entrepreneurial behavior to a less strict conceptualization, including exposure to entrepreneurial contexts as a paid organizational employee of a new business project, we amplified the number of relevant cases to one in three individuals, with an increased total of 41 entrepreneurs with value-creating experiences, 9 having experienced failure, and 9 experiencing both successes and failures. These rates of TEA are likely to be overestimated by self-selection when participating in a survey on entrepreneurship. However, as we focus on the relationship between variables, and there is sufficient representation of entrepreneurs, non-entrepreneurs, and individuals with varying entrepreneurial identity aspiration levels covering the entire range of the measurement scale, we do not expect this to be problematic.

Addressing the confirmatory part of our empirical analysis, we found that entrepreneurial identity aspirations display moderate temporal stability (*Hypothesis 1*). A model using the same construct as dependent and independent variables, but with the latter measured 11 years earlier, plus the demographic control variables, resulted in 28.0% explained (adjusted) variance. This is a value far superior to 10.7% than what would result from using the control variables as sole predictors (*i.e.*, gender, age, work experience, family with entrepreneurial exposure, and education level). This result was also robust across the various tested models. This is compatible with the entrepreneurial identity property conceptualization (Radu-Lefebvre et al., 2021) and extends the empirical evidence from Obschonka et al. (2015) and Collewaert et al. (2016) by providing new long-term evidence in which only the middle and short term existed. However, our study also provides a rich descriptive account of the existing variability within the sample cases, often hidden by the most common focus on average effects. Unsurprisingly, a relevant portion of the literature focusing

on the dynamic nature of entrepreneurial identity relies on qualitative research and case studies (Wagenschwanz, 2021).

We also found supporting evidence that entrepreneurial identity aspirations are associated with subsequent entrepreneurial behavior (*Hypothesis 2*). Despite being a small effect, and the model only accounting for an adjusted variance of 15.6% to 9.6% (less for the looser conceptualization of *Entrepreneurial Behavior*), this effect was found to be robust to different conceptualizations of the dependent variable. This relationship is consistent with the literature (Fauchart & Gruber, 2011; Herron & Robinson, 1993; York et al., 2016; Zuzul & Tripsas, 2020) and *ex ante* empirical evidence that supports entrepreneurial identity as an antecedent of founding intentions (e.g., Obschonka et al., 2015) and entrepreneurial behavior (Farmer et al., 2011; Seibert et al., 2021).

Finally, we found both expected and unexpected results regarding our proposition that prior entrepreneurial success would lead to higher entrepreneurial identity aspirations and that prior failure would reduce them. First, addressing the results that were consistent with our expectations (*Hypothesis 3*), we found empirical support for successful entrepreneurial behaviors, leading to increased entrepreneurial identity aspirations. In this case, the effect is comparable with past entrepreneurial identity aspirations. However, experiencing startup success while working as an employee does not seem to raise subsequent aspirations as much as experiencing success as a new business project owner. Second, surprisingly, we found no empirical support for the negative effect of an unsuccessful entrepreneurial experience on entrepreneurial identity aspirations (*Hypothesis 4*). In fact, our tested models suggested, in the worst case, a non-significant effect or, in the best case, exactly the opposite of what we initially hypothesized: a small positive effect with borderline significance ( $0.05 < p < 0.10$ ). The worst case is where we only consider the direct experience of having had an unsuccessful new venture, whereas the best case is where we also consider an employee from a failed start-up as having had a negative entrepreneurial experience. This result is compatible with the significant positive net effect found between entrepreneurial behavior and entrepreneurial identity aspirations when successful and failed experiences are modeled as undifferentiated. Thus, (1) unsuccessful entrepreneurial behaviors did not affect individuals' subsequent entrepreneurial identity aspirations and; (2), in the special case where failure is endured as an employee, rather than as a business owner, entrepreneurial exposure to startup environments may still leave entrepreneurial identity enhancing externalities.

Our findings are coherent with, and extend, Obschonka et al.'s (2015) longitudinal study, which was based on a slightly larger combined sample of German scientists but with a smaller timeframe of four years. These results are inconsistent with the insignificant relationship reported by Farmer et al. (2011) from a larger combined sample of the adult populations of three different countries. Notably, the latter study is less comparable to ours because it uses a different (and less appropriate) cross-sectional correlation analysis. Neither study differentiated between positive and negative entrepreneurial experiences.

Surprisingly, as mentioned previously, in our study failures do not seem to harm entrepreneurial identity aspirations. Depending on the direct or indirect nature of this experience, they may even promote entrepreneurial identity aspirations and



subsequent entrepreneurial activity. Specifically, when there was not enough “skin in the game,” as an employee in a new business venture, we found positive experiences leading to slightly lower increases in entrepreneurial identity and negative experiences to transition from being neutral to displaying borderline significant positive effects. These findings differ from those of Newbery et al. (2018) wherein, in a business simulation game where students were given performance feedback on their startups, they find that entrepreneurial identity salience increases when feedback is positive and vice versa. However, because it is understood as a simulation, students may not feel that they have benefited from a real entrepreneurial experience. In real-life settings, individuals may learn more from their past entrepreneurial experiences and be better prepared to avoid them in subsequent entrepreneurial ventures (Cope, 2005; Corbett, 2005; Politis, 2008), making them more familiar with effective entrepreneurial behaviors and closer to realizing their identity aspirations (Alsos & Kolvereid, 1998; Farmer et al., 2011; Hoang & Gimeno, 2010). Furthermore, our findings align with the extant literature, such as Cardon et al. (2011), which associates sensemaking in failure attribution with subsequent reengagement in entrepreneurial behavior. This coherence also extends to studies, like that of Simmons et al. (2023), which identify certain psychological characteristics - commonly observed among entrepreneurs, such as workaholism and sensation-seeking - as significant factors in driving reengagement in entrepreneurship, even in the face of financial loss. Additionally, Farmer et al. (2011) suggest that past entrepreneurial experience strengthens the identity aspiration–behavior relationship due to an entrepreneur’s acquired social network from past startup involvements. This experience may also benefit the success of these behaviors, providing useful training in agile methodologies, leadership, and innovation, which have been found to be related to corporate entrepreneurship (Medina Molina et al., 2022).

Overall, a virtuous cycle of entrepreneurial identity and entrepreneurial experience seems to exist, where aspirations for an entrepreneurial identity increase the likelihood of subsequent entrepreneurial experience. Moreover, when this experience is successful, entrepreneurial identity aspirations are further promoted, leading to a greater likelihood of continued entrepreneurial activities.

## Conclusions

Our study attempted to shed light on how entrepreneurial identity evolves and develops over a relatively long period and how entrepreneurial experiences may shape the temporal stability of this identity. We conducted a longitudinal analysis based on the 1st wave and 4th follow-up surveys from the EEP Portugal research project, 11 years apart. We tested and confirmed that past entrepreneurial identity aspirations influenced current identity aspirations during this longer period. Thus, we greatly extend the known limits of the period in which this construct exhibits temporal stability and path dependence. We also found that entrepreneurial identity aspirations stated 11 years prior were antecedents of entrepreneurial experience during the interval between the two surveys. Prior aspirations positively predict both positive and negative entrepreneurial behavior/experiences, whether as a new business creation or as a

paid employee in a new business venture. Finally, we found that these prior entrepreneurial behaviors were also determinants of current entrepreneurial identity aspirations; specifically, successful prior experiences increase current aspirations, whereas unsuccessful experiences could not be found to have a negative impact on entrepreneurial identity. In fact, the opposite effect is much more likely, when an individual worked for someone else in a new business project that failed.

These findings make a significant empirical contribution to the literature, as there are few quantitative longitudinal studies on how entrepreneurial identity forms, matures, and progresses. Our work is also relevant to practice and policymaking, as we show evidence that entrepreneurial identity aspirations are largely shaped by prior entrepreneurial experience. Successful entrepreneurial experiences analyzed in this study positively influenced entrepreneurial identity, while unsuccessful entrepreneurial experiences were either neutral or positive. This suggests that, if conditions are available for individuals to engage in entrepreneurship and learn from those experiences in real environments, entrepreneurial activity and business creation may increase. Entrepreneurship education provides the opportunity for such experiences in low-risk environments. Our findings provide evidence for advocating a more experiential type of entrepreneurship education to promote entrepreneurial behavior and identity.

### **Limitations and future research**

Despite our efforts, this study had some limitations. While considering the role of a limited set of external factors (e.g., family entrepreneurial exposure), entrepreneurial identity is also subject to many other external factors (e.g., institutional frameworks and economic situations) that we did not consider. Specifically, macroeconomic conditions at the time of the surveys may have influenced the level of self-reported aspirations, although we cannot control for this with our design.

Our initial sample comprised relatively young and educated adults from Portugal, many of whom were on the verge of having their first major professional experience. In addition, the analyzed period was sufficiently long to include two major international crises (both economic and social consequences). Thus, to assess our findings' external validity, future research should also analyze other populations and cohorts to identify possible differences regarding their entrepreneurial identity stability, its enablers and inhibitors, and how long-lasting their effects can be over time. Given its relevance to entrepreneurial education, future studies should examine other types of entrepreneurial identity-relevant experiences.

The follow-up survey attrition was high, with approximately one in five initial respondents submitting their answers 11 years later. Despite the large number of respondents who could not be reached, we found no evidence of meaningful differences between those who remained and those who dropped out of our study, regarding their demographic variables and entrepreneurial identities. However, individuals whose entrepreneurial experiences degraded their entrepreneurial identities were less likely to complete the follow-up survey. The fact that we had a smaller number of respondents reporting entrepreneurial failures than reporting

entrepreneurial successes is coherent with this hypothesis. Thus, our findings on the possible neutral (or even positive) effects of the experience of entrepreneurial failure should be considered preliminary and further confirmed in future studies.

We acknowledge that we did not distinguish between opportunity- and necessity-driven entrepreneurs. Not doing so will likely weaken the relationship between entrepreneurial identity and entrepreneurial experiences, since the latter form of entrepreneurial behavior is likely to be less correlated with such identity. Accordingly, interesting avenues for future research are to understand the link between a situation of necessity and the decision to engage in necessity-driven entrepreneurship and the interplay between such decisions and the existence, creation, and/or development of an entrepreneurial identity.

The low explanatory power of entrepreneurial behavior by prior entrepreneurial identity suggests that there remains much to be known and further investigation is needed. To this end, it would be interesting to investigate what other personal and/or professional experiences individuals with a high salience of entrepreneurial identity engage in to release the eventual tension created by the fewer entrepreneurial opportunities within their careers as organizational employees.

Further avenues for future research include comparing the impact of real-life entrepreneurial experiences with in-game or simulated experiences (*e.g.*, through virtual or augmented reality systems) and understanding how the latter sources of experience can become more similar (or even augmented) in their impacts. This is especially relevant given *ex ante* findings regarding the negative impact of negative entrepreneurial experiences acquired through a game, unlike our findings of no effects (or even positive effects) of a negative real-life experience.

Finally and directly following our study's findings, knowing more about the contexts and reasons why some consider their failure experiences positive while others do not appears to be particularly relevant.

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**Data availability** The data from the EEP Portugal Dataset, upon which this study was based, may be provided upon request to the corresponding author.

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