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Information source and entrepreneurial performance expectations: Experience-based versus description-based opportunity evaluations

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ABSTRACT

How does the information source—experiential or descriptive—used by nascent entrepreneurs affect their performance expectations? Since judgments based on experience diverge from those based on descriptions, especially when prospects include a low-probability event such as entrepreneurial success, we argue that entrepreneurs' expectations of success differ as a function of the information source they consult. We also contend that industry conditions interact with the information source to determine expectations. In two studies using field data from entrepreneurial settings, we found that experience generated lower expectations than did descriptions in unfavorable industry conditions (when success was a low-probability event). This pattern was reversed in favorable conditions (when success was more likely). Our findings provide field evidence consistent with the description–experience gap literature, thereby shedding new light on how nascent entrepreneurs' informational environment shapes how they appraise business opportunities.

1. Introduction

The assessment of a business opportunity is a key instance of entrepreneurial judgment and decision-making (Chen & Liu, 2020; Shepherd, Williams & Patzelt, 2015) in which founders process the available information to form expectations about their new ventures' likely performance upon entry. The extant literature suggests that entrepreneurs tend to form overly optimistic expectations (Cain, Moore & Haran, 2015; Cooper, Woo & Dunkelberg, 1988; Khanin, Turel, Mahto & Liguori, 2021) mainly due to cognitive biases (Cossette, 2014; Zhang & Cueto, 2017; Thomas, 2018) inherent to entrepreneurs (Keh, Foo & Lim, 2002; Busenitz & Barney, 1997). However, studies of optimistic biases among entrepreneurs have focused on their post-market entry expectations, which are likely to be higher than those of nascent entrepreneurs prior to establishing their new ventures (Chen, Croson, Elfenbein & Posen, 2018).

Despite the relevance of performance expectations for entrepreneurial theory (Dimov, 2010; Yu, Wang, Li & Lin, 2022), little is known about the process through which nascent entrepreneurs form expectations during the pre-entry stage (Bennett & Chatterji, 2023) in which they resort to their personal experiences and to descriptive information available in the environment to generate a mental representation of the opportunity they pursue (Dencker, Gruber & Shah, 2009; Tietz, Lejarraga & Pindard-Lejarraga, 2021). Interestingly, these two information sources—experience and descriptive— can lead to contradictory expectations. While the experience of most entrepreneurs is that "failure" is the normally expected outcome (Boso, Adeleye, Donbesuur & Gyensare, 2019), descriptions of success dominate the information environment (e.g., discourses by famous entrepreneurs, blogs, or news media) as if success were a "normally expected" outcome, nudging entrepreneurs toward market entry.

This study aims to explore the link between information source and entrepreneurial performance expectations: how people learn about an opportunity can affect their mental representations of it and, in turn, influence their expectations (Lejarraga & Müller-Trede, 2017; Csaszar & Laureiro-Martínez, 2018). For simplicity, we refer to *experience* as information generated by entrepreneurs personally encountering an event and living through its consequences over time, be it through founding new ventures or experiences gathered in the industry, while *descriptions* refer to information generated by third parties and descriptively revealed to the entrepreneur, such as written reports and market analyses communicated through spoken or written symbols (Hertwig, Hogarth & Lejarraga, 2018). We rely on the *description–experience gap* literature (see Wulff, Mergenthaler-Canseco & Hertwig, 2018, for a

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review) that discusses how the information source through which prospects are assessed affects judgments, particularly when they include a low-probability event (Hertwig, Barron, Weber & Erev, 2004; Lejarraga & Müller-Trede, 2017; Wulff et al., 2018). Judgments based on descriptive information and experience lead to behaviors consistent with the "overweighting" (i.e., exaggerating the occurrence) and "underweighting" (i.e., understating the occurrence) of low-probability events, respectively (Kahneman & Tversky, 1979; Hertwig et al., 2018).

Because entrepreneurial success is a low-probability event in the sense that new ventures tend to fail substantially more often than they succeed (e.g., Shepherd, Douglas & Shanley, 2000), whether entrepreneurs rely on descriptions or experiences to evaluate the potential success of an opportunity affects how they form expectations. However, even if the probability of entrepreneurial success is generally low, it is not always *equally* low and varies across industry conditions (e.g., Carroll & Hannan, 1989a). Therefore, one of our contributions is to identify a moderator of the description–experience effect on expectations, namely industry conditions in terms of density or number of competitors, in the context of nascent entrepreneurs. Depending on the density at the time of founding, the industry may be less or more favorable for new entrants, meaning that entrepreneurs may face lower or higher chances of success (Carroll & Hannan, 1989a). Notably, the information source entrepreneurs consult affects their expectations, and this relationship is moderated by density. Using two datasets from different entrepreneurial settings, we test the effect of the information source on entrepreneurial performance expectations in two different environments: in unfavorable conditions where success has a low probability of occurrence and in favorable conditions where success is more likely.

Moreover, we contribute by applying the description–experience distinction using non-laboratory entrepreneurial data, thereby responding to the call by previous scholars to "supplement laboratory data […] with field data" (Lejarraga & Müller-Trede, 2017, p. 1969). This also brings a new perspective on experience, perhaps the most widely studied variable in entrepreneurship research which has traditionally been conceptualized as a resource that helps founders attract larger funding (Kaplan & Stromberg, 2003), increase their search activity (Rosenkopf & Almeida, 2003), or enhance pattern recognition skills (Baron & Ensley, 2006). Here, we stress the judgmental differences brought about by experience vis-a-vis descriptive information, and how they subsequently affect expectations.

2. Background and hypotheses

2.1. Entrepreneurial performance expectations

Scholars have long been interested in how entrepreneurs form performance expectations. Expectations associated with an opportunity trigger entrepreneurs' willingness to invest time and resources to pursue opportunities (Simon, Houghton & Aquino, 2000; Cassar, 2010; Dimov, 2010). The fact that entrepreneurs consistently decide to venture into new businesses, even in the most discouraging conditions, has been traditionally interpreted as a result of cognitive biases leading to overoptimistic expectations (Khanin et al., 2021; Kahneman & Lovallo, 1993; Thomas, 2018). Studies have reported a higher prevalence of cognitive biases of overconfidence or overoptimism among entrepreneurs, suggesting that excessively high expectations are characteristic of entrepreneurs (Busenitz & Barney, 1997; Thomas, 2018). For example, Cooper et al. (1988) showed that entrepreneurs significantly overestimate their chances of success relative to historical rates and to competing entrepreneurs' chances of success. Similarly, Cassar (2010) found that entrepreneurs have overly optimistic expectations of success compared to non-entrepreneurs, revealed by sales overestimations, the number of employees, and the likelihood of becoming an operating business after one year.

Nevertheless, this finding has been disputed (see Cossette, 2014, for a review) by studies concluding that entrepreneurs are no more optimistic than managers in established firms (e.g., Lowe & Ziedonis, 2006). Likewise, scholars disagree on the effect of experience on overoptimism biases among entrepreneurs: while Mehrabi and Kolabi (2012) suggest that experience increases overoptimism bias among entrepreneurs, Koellinger, Minniti, and Schade (2007) show that inexperienced entrepreneurs are more confident in their own skills, thus displaying higher overall optimism than more experienced ones.

The inconclusive relationship between optimism biases and entrepreneurial expectations has also sparked interest in understanding the antecedents of performance expectations. Earlier attempts have focused on identifying entrepreneurs' personality traits, but with limited success (Low & MacMillan, 1988). Other studies have explored how heuristics and biases affect the perception of risk associated with new venture opportunities (Keh et al., 2002; Busenitz & Barney, 1997), finding that reliance on heuristics reduces entrepreneurs' risk perception, leading to overoptimistic behavior (Zhang & Cueto, 2017; Thomas, 2018). However, previous studies have not investigated how the information source used in the process of opportunity evaluation affects expectations. While some studies have explored firms' determinants of information search strategies (Cooper, Folta & Woo, 1995; Specht, 1987) and how they relate to the number of opportunities identified (Westhead, Ucbasaran & Wright, 2009) or amount of innovative activity (Hartman, Tower & Sebora, 1994), they have been silent about their effect on performance expectations.

Existing research shows that acquiring more information—whether experiential or descriptive— is linked to higher performance expectations, even when the information does not improve judgmental accuracy (Tsai, Klayman & Hastie, 2008). One argument supporting this claim is that possessing more information correlates with being better prepared and predisposed toward exerting more effort, and therefore expecting a higher payoff in return. Additionally, actively acquiring information from their external and internal environment allows entrepreneurs to effectively exploit opportunities well in advance (Cockburn, Henderson & Stern, 2000), leading to an advantage over competitors and therefore higher expectations of success. Several authors suggest a psychological argument, namely that information acquisition can increase individuals' overoptimistic tendencies (Kahneman & Lovallo, 1993; Zacharakis & Shepherd, 2001), potentially leading to high expectations. Lastly, self-selection processes —i.e., the fact that individuals with specific characteristics self-select into entrepreneurial activities while others do not— could result in the observation that higher expectations correlate with information acquisition if the individuals who collect negative information about their prospects decide to abandon their startup projects and are thus left unobserved (Hogarth & Karelaia, 2012). Therefore, based on the arguments established in the literature, our baseline hypothesis is that reliance on descriptive and/or experiential information will positively affect entrepreneurial performance expectations.

However, we argue here that even if both experience and description positively affect expectations, these two information sources will differ in terms of the magnitude of their influence on entrepreneurs' expectations of success.

2.2. Experience Vs. Description: Two sources of information

A long research tradition in cognitive and experimental psychology has attempted to understand how people perceive probabilistic events and why perceived probabilities deviate from actual (i.e., objective) probabilities (Peterson & Beach, 1967; Kahneman & Tversky, 1979; Hertwig et al., 2004). Scholars in judgment and decision-making have used the dichotomy between "experience" or "descriptions" as two fundamentally different information sources to make decisions that affect the ways people perceive probabilities, and therefore influence their expectations (Hertwig et al., 2004; Hau, Pleskac & Hertwig, 2010; Wulff et al., 2018; Hertwig & Wulff, 2022). While experienced individuals can access their sample of past experiences from previous ventures or industry exposure to help them estimate the chances of

success for a new opportunity, inexperienced individuals can only access descriptive information. For example, an experienced employee leading a company spin-off (i.e., a serial entrepreneur) can use such experience to appraise a new business opportunity and consequently found a new firm. By contrast, an individual with no business experience who has a potentially marketable idea must refer to existing industry statistics, market analyses, industry reports, learning from other entrepreneurs and market experts, or any other information generated by third parties (i.e., not by the direct experience of the founder) to ascertain an opportunity's attractiveness. In this case, the nascent entrepreneur assesses the chances of success of the new venture based on descriptive information. Descriptive information is not limited to formal industry or market reports but extends to all information types that are not generated by the entrepreneur's personal experience, including magazine news, expert presentations at conferences, or blog or social media opinions, all of which are generated by a third party and descriptively revealed to the entrepreneur (Hertwig et al., 2018).

More than a decade's worth of experimental evidence consistently shows that these two information sources have a drastically different effect on people's perceptions, even if the experienced or described information convey mathematically equivalent information (Hertwig et al., 2004; Hertwig & Wulff, 2022). For example, a description that an event has a 0.1 probability of success is mathematically equivalent to experiencing one success in ten trials. In description-based choices, as illustrated by experimental studies where decision-makers are given a full description of the options (i.e., possible outcomes and respective probabilities), individuals behave as if they overweight (i.e., exaggerate) low-probability events and underweight (i.e., understate) moderate and high probabilities (Kahneman & Tversky, 1979; Tversky & Kahneman, 1992; Hertwig et al., 2004). In the case of description-based choices, low-probability events (i.e., infrequent events) stand out due to their rarity and therefore tend to be perceived as more salient than they actually are (e.g., airplane accidents are perceived as substantially more likely than they really are). This phenomenon, by which the mere description of an infrequent event leads to exaggerating its likelihood, has been termed the "mere-presentation" effect (see Erev, Glozman & Hertwig, 2008). By contrast, overweighting the occurrence of a low-probability event implies the underweighting of moderate or high probability events (i.e., more frequent events tend to be perceived as slightly less likely to occur), a phenomenon labeled *subcertainty* (Kahneman & Tversky, 1979). For example, a founder overweighting the likelihood of her new venture successfully going IPO implies that she underweights the likelihood of the new venture *not* going IPO.

In contrast, research by cognitive psychologists has consistently demonstrated that when individuals make decisions based on experience, the above-mentioned pattern reverses (Hertwig et al., 2004; Hertwig & Wulff, 2022). Experimental studies have shown that individuals making decisions from experience choose as if low probability events are underweighted and moderate or high probabilities are overweighted (e.g., Hau et al., 2010; Hau, Pleskac, Kiefer & Hertwig, 2008; Hertwig et al., 2004; Hertwig & Wulff, 2022). One factor contributing to the underweighting of low-probability events in decisions from experience is people's tendency to rely on small samples of experience. In small samples, low-probability events tend to be underrepresented or not encountered and therefore have less impact on people's choices than they deserve according to their objective probability (Wulff et al., 2018). Small samples of entrepreneurial experience tends to be the norm among entrepreneurs: a recent study reports an average of 0.93 ventures founded per entrepreneur and a standard deviation of 1.32 among 421 entrepreneurs (Amankwah-Amoah, Adomako & Berko, 2022), suggesting that samples of past founding experiences tend to be meager. Another factor contributing to this pattern is the *recency effect* (Plonsky, Teodorescu & Erev, 2015), which refers to the principle that most recently experienced outcomes are weighted more heavily than those experienced farther in the past, which is another form of relying on smaller (i.e., the most recent events) samples. However, studies show that this underweighting pattern is robust and persists even when samples are large, when stakes are high, and when there are no recency effects (Baron, 2009; Hau et al., 2008). Correspondingly, underweighting low-probability events implies overweighting moderate or larger probability events.

Research on the description–experience gap is limited to experimental settings where probabilities are well defined (Lejarraga & Müller-Trede, 2017; Hertwig & Wulff, 2022), but in the real world, entrepreneurs' probabilities of success are less clear. Although industry reports and market studies cannot pinpoint an entrepreneur's exact probability of success, verbal expressions of probability-like information abound in the entrepreneurs' environment, making it feasible for them to form an approximate idea of their probability of success. For example, on TechCrunch, a popular entrepreneurship website, entrepreneurs can be exposed to statements such as "this industry is one of the brightest spots in the economy today" (Taylor, 2013) or "the saturated cybersecurity market" (Loizos, 2020), all of which shape entrepreneurs' estimates of their success probability. Research examining the correspondence between verbal expressions of probability and actual probabilities has revealed strong correlations and high consistency in the meanings of such phrases (Pellissier & Van Buer, 1996), suggesting that entrepreneurs can indeed infer probabilistic information from descriptions like those listed above.

Hence, whether entrepreneurs assess their chances of success through experience or through descriptive sources can affect their subjective perception of their chances of success, and therefore their expectations. If experience and description lead individuals to act as if low-probability events are less and more likely to occur, respectively, than they objectively are, the effect of both will depend on the rarity of entrepreneurial success. In other words, experience and description may not have an unvarying effect on the expectations of entrepreneurial success but rather depend on the rarity of entrepreneurial success. To determine when entrepreneurial success is a low-probability event or more frequently observed, we now turn to the literature on industry life cycle, which provides us with a theoretical framework to understand how the phases of an industry translate into different chances of success for new entrants.

2.3. *The interaction between industry conditions and information source: Industry life cycle and perceived chances of success*

Although the chance of success for new ventures is low, with ten-year survival rates ranging from 0.10 to 0.35 (U.S. Bureau of Labor Statistics, 2019; Timmons, 1994; Boso et al., 2019), it is not constant across the evolution of an industry's life cycle. This has implications for our arguments extracted from the description–experience literature, which focuses on how people perceive low-probability events. An industry's life cycle can be approximated by examining the total number of organizations that compete (i.e., the industry density). Industrial economists and industry life cycle theorists concur that new firms' chances of success are affected by the density of competition faced at market entry time (Klepper & Miller, 1995; Geroski, 2001). According to the density-dependent model (Carroll & Hannan, 1989a), organizations' survival chances have a curvilinear relationship with density: survival chances are low when density is low, then reach a maximum when density increases, and finally decrease and become low again when density is maximal (see Fig. 1 below). Research on industrial dynamics (Carroll & Hannan, 1989b; Dobrev & Gotsopoulos, 2010) suggests that the success of new entrants in terms of survival is more likely when some entrepreneurs have already entered but the market is not yet crowded ("Growth Stage" in Fig. 1) than during the emergence and maturity of the industry (the "Emergence" and "Maturity and Decline" Stages in Fig. 1).

During the emergence stage of an industry, uncertainty about the consequences of entry is high as there is little information regarding whether there is sufficient demand for the new products/services offered

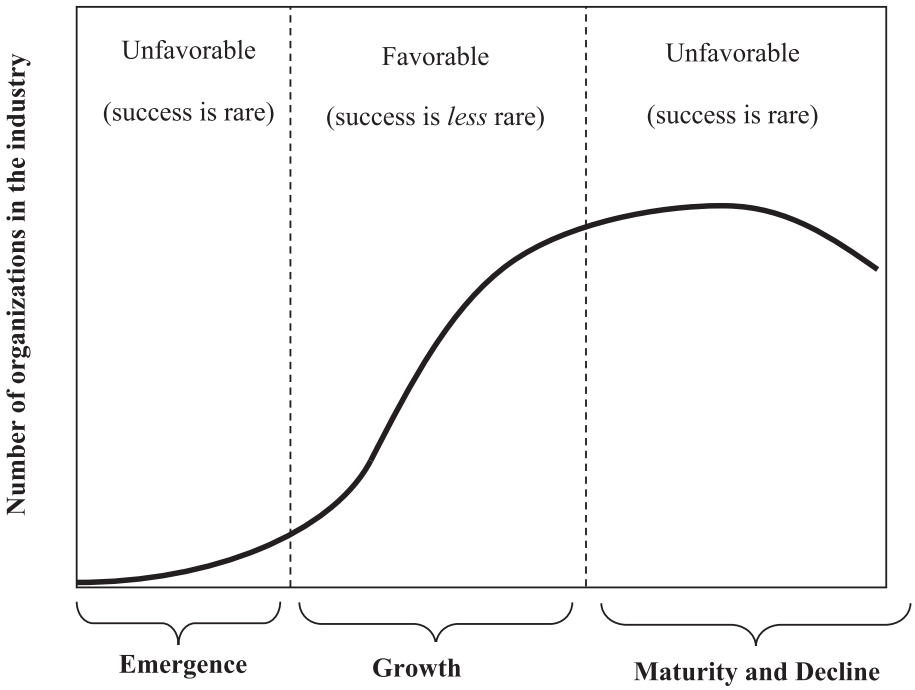

Fig. 1. Stages of the industry life cycle. The figure is based on the theoretical arguments from Carroll & Hannan (1989a) and Dobrev & Gotsopoulos (2010). The density of competition (the number of competing organizations in the industry) appear in the Y-axis, and time since industry creation in the X-axis. At the outset of the industry (Emergence) density is low, with very few competitors entering the industry; as the industry evolves with time, more competitors enter (Growth); later in time (Maturity and Decline) the density of competition is at a maximum point. According to the density-dependent model, the probability of new venture success is low at the Emergence and Maturity and Decline stages and is highest during the Growth stage.

by entrants. During the maturity and decline stage, uncertainty about the established demand is low, but uncertainty about the potential demand faced by a new entrant is high as the market becomes crowded (Hannan & Carroll, 1992), driving the chances of success of new ventures down. The early and late stages of the industry are thus characterized by a high mortality rate for existing organizations and even higher mortality for entrants (Dobrev & Gotsopoulos, 2010).

Although the density-dependence model addresses success in terms of "firm survival," we draw on it to approximate the chances of entrepreneurial success in general (i.e., success in terms of survival and financial performance). Consistent with this argument, Eisenhardt & Schoonhoven (1990) have shown that firms grow more when they enter markets in the growth stage rather than in the emergent or maturity stages. For simplicity, we refer to the former as *favorable* industry conditions and to the latter (emergent and maturity stages) as *unfavorable* industry conditions.

During unfavorable conditions, because entrepreneurial success is a low-probability event, entrepreneurs who evaluate their chances of success by resorting to their experience are likely to underweight the likelihood. This is expected because, through learning from experience, entrepreneurs rarely come across success—especially when samples of experience are small— and therefore become under-sensitive to the already low probability of success. Consequently, in unfavorable conditions, performance expectations based on experience will reflect an underestimation of the low probability of success, affecting expectations. By contrast, reliance on descriptive information to evaluate the business opportunity may lead to overweighting the probability of success (Kahneman & Tversky, 1979), thereby leading entrepreneurs to form larger expectations of success than those based on experience. In description, over-sensitivity to low-probability events is expected due to the mere-presentation effect through which low-likelihood events appear more salient than they actually are. An example of this effect is the extensive news coverage that rare entrepreneurial successes receive, which leads to the perception that success is more likely than it really is. Consequently, in unfavorable conditions, expectations based on descriptions will be higher than those based on experience. Therefore, our first hypothesis is:

H1. In unfavorable industry conditions (i.e., when success probability is low), experience leads to lower expectations of success than description.

Alternatively, during the growth stage, the chances of success improve, and new venture survival rates are highest because the industry is becoming legitimate and grows quickly until it peaks (Carroll & Hannan, 1989b). During the growth stage, not only the public becomes more aware of the new products or services —and thus demand increases— but also the resource space is expanded, further increasing the attention of customers, investors and entrepreneurs (Hannan & Carroll, 1992). As industry conditions become more favorable, firm survival is more frequent than in unfavorable industry conditions (Geroski, Mata, & Portugal 2010); thus, the objective probability of success moves away from the low end and becomes moderate[1]. In other words, entrepreneurial success is no longer rare as in unfavorable conditions. According to the experimental literature discussed earlier, moderate to high probability events are perceived as more likely to occur than their actual probability suggests (i.e., they are overweighted) when evaluated from experience (Hertwig & Wulff, 2022). In experience, as events are observed more frequently, they become more salient and easily recognized. Supporting this view, De Palma et al (2014) argue that in decisions from experience, when people experience events sequentially, more attention is allocated to the processing of the frequent and not the rare events, leading to over-emphasizing moderate to high-probability events.

[1] We use the term *moderate* because entrepreneurial chances of success never reach a 'high' probability. The literature in entrepreneurship consistently conceives chances of success as belonging to the lower end of the spectrum (Aldrich & Yang, 2012): transitioning from unfavorable (where probability of success is extremely rare) to favorable industry conditions does not imply a change from low to high, but rather from low to moderate chances of success.

Experienced entrepreneurs may therefore overestimate their actual likelihood of success during favorable stages, because their experience and the experience of competitors under similar conditions is likely to reflect a higher frequency of successful situations than in unfavorable conditions. In this case, past experiences drawn from an environment where success is likely to have happened, are vivid and impactful, leading entrepreneurs to make immediate inferences about what they have experienced (Hertwig et al., 2018).

By contrast, moderate to high probabilities are perceived as less likely to occur when evaluated from description (Kahneman & Tversky, 1979; Erev et al., 2008), because described information about frequent events is not as impactful in people's perceptions as in the case of information from experience. In description, frequent events receive less attention than they objectively deserve (i.e., they are underweighted) compared to rare ones (i.e., these are overweighted), leading to discounting their perceived frequency (De Palma et al., 2014). Because success becomes more likely in favorable industry conditions, resorting to descriptive information would underweight the chances of success and overweight the likelihood of failure, pushing entrepreneurs' perception of success downwards with respect to the objective probability. Therefore, because description has a deflating effect on the perception of moderate probabilities while experience has an inflating one, we hypothesize the following relationship:

H2. In favorable industry conditions (i.e., when success becomes more likely), experience leads to higher expectations of success than description.

Moreover, if the effect of the information source on expectations depends on whether entrepreneurial success is extremely low or moderate, we should expect the effect of each information source on expectations to vary in magnitude between industry conditions, which determine whether success is rare. Whereas in H1 and H2 we hypothesize about the effect of experience and description *within* the same industry conditions, we now hypothesize that each information source has a different effect *between* industry conditions.

When comparing the effect of the information source in unfavorable versus favorable industry conditions, two overlapping effects coexist that may determine expectations. On the one hand, improving industry conditions (i.e., going from unfavorable to favorable conditions) should lead to improving chances of success (Dobrev & Gotsopoulos, 2010) and hence overall higher expectations. On the other hand, because the change in industry conditions affects the underlying likelihood of success, it in turn affects how the chances of success are perceived as a function of the information source. Owing to the underweighting of low-probability events, experience will further reduce expectations in unfavorable conditions and further increase them in favorable conditions due to overweighting moderate probability events. Hence, experience will lead to lower expectations in unfavorable than in favorable industry conditions. We therefore expect that:

H3a: Expectations based on experience will be lower in unfavorable than in favorable industry conditions.

Conversely, owing to overweighting of low-probability events, description will have an increasing effect on expectations in unfavorable conditions, while it will have a reducing effect in favorable conditions. If, as the mere-presentation effect (Erev, Glozman & Hertwig, 2008) suggests, a rare event receives disproportionately more attention than frequent events when evaluated from descriptive information, pushing its perceived chance of occurrence substantially higher than it objectively deserves, then founders may overreact with higher expectations under unfavorable industry conditions.

For example, a young, inexperienced entrepreneur who only accesses descriptive information about a nascent technology in an emergent industry may exaggerate the actual chances of success (e.g., by overestimating first-mover advantages or the potential benefits of the new technology) to the point of having higher expectations than a similar founder who enters a growing industry (objectively more favorable) whose perception of the likelihood of success is not inflated by the novelty, salience and uniqueness of the descriptions. Our claim is that if entrepreneurs form expectations as predicted by the description-experience gap, the perceptual effect offsets objective probabilities and therefore entrepreneurs relying on descriptions will overweight their probability of success in unfavorable conditions and their probability of failure in favorable conditions, leading to higher expectations in unfavorable than in favorable conditions. Consequently, we expect that:

H3b: Expectations based on description will be higher in unfavorable than in favorable industry conditions.

Below, Fig. 2 summarizes the hypothesized effects resulting from the interaction between the information source and industry conditions.

3. Study 1

3.1. Study 1 data

We test our predictions in two field studies. In the first, we use secondary data concerning entrepreneurs' performance expectations, experience, and access to information at the founding time from the publicly available Panel Study of Entrepreneurial Dynamics II (PSED II) conducted by the Institute for Social Research, University of Michigan. The PSED II dataset (see Reynolds and Curtin, 2008 for a review) results from the revised version of the PSED I survey, which consisted of a large sample of American adults, from which a cohort of nascent entrepreneurs was identified. The PSED II collects information on the characteristics and activities of individuals who have engaged in actions to create a firm over the 12 months preceding their inclusion in the survey. Survey respondents were disregarded if they reported positive cash flows from the venture before the screening interview or had worked on their nascent venture for longer than ten years prior to the first interview. Collecting these data before any profit is earned or even a new firm is formally established helps to prevent hindsight bias related to expectations (Cassar and Craig, 2009). This method for data collection allows access to entrepreneurs' information early in the process of firm creation, which is usually difficult to collect without bias (Reynolds, Carter, Gartner & Greene, 2004). This method also avoids survivorship bias in the selection of entrepreneurs and records expectations at founding independently of the subsequent performance reported in follow-up interviews. A total of 1,214 initial interviews were conducted in 2005.

3.2. Variables

The literature studying entrepreneurial performance or success has identified several dimensions underlying this construct (Staniewski & Awruk, 2019). These dimensions can include financial or economic dimensions such as growth, profits, market share (Murphy, Trailer & Hill, 1996), earnings, firm size, or survival probability (Fried & Tauer, 2015), and non-financial dimensions, such as achieving a work–life balance (Orlandi, 2017), or gaining prestige (Burger, 2008). In the current study, we focus on revenue expectations because it is a commonly used performance measure (Cassar, 2010; Tietz et al., 2021) and a prerequisite for other forms of success (e.g., venture survival, personal prestige, or work–life balance), which are not likely to materialize without sustained revenues.

The dependent variable labeled *Expectations* was operationalized using the logarithm of expected annual revenue (in dollars) in five years reported in the PSED II survey (Cassar, 2010; Tietz et al., 2021). After the logarithmic transformation, the *Expectations* variable was almost normal (skewness 0.165, kurtosis 0.309).

To measure the effect of the information source on performance expectations, we distinguished between descriptive information, startup experience, and industry experience. Unlike other streams of research examining the depth and breadth of information search (Fiet, Norton & Clouse, 2013; Patel & Fiet, 2009; Patel & Van der Have, 2010), here we were interested in distinguishing between information sources. Therefore, we captured information sources through dummy variables. We

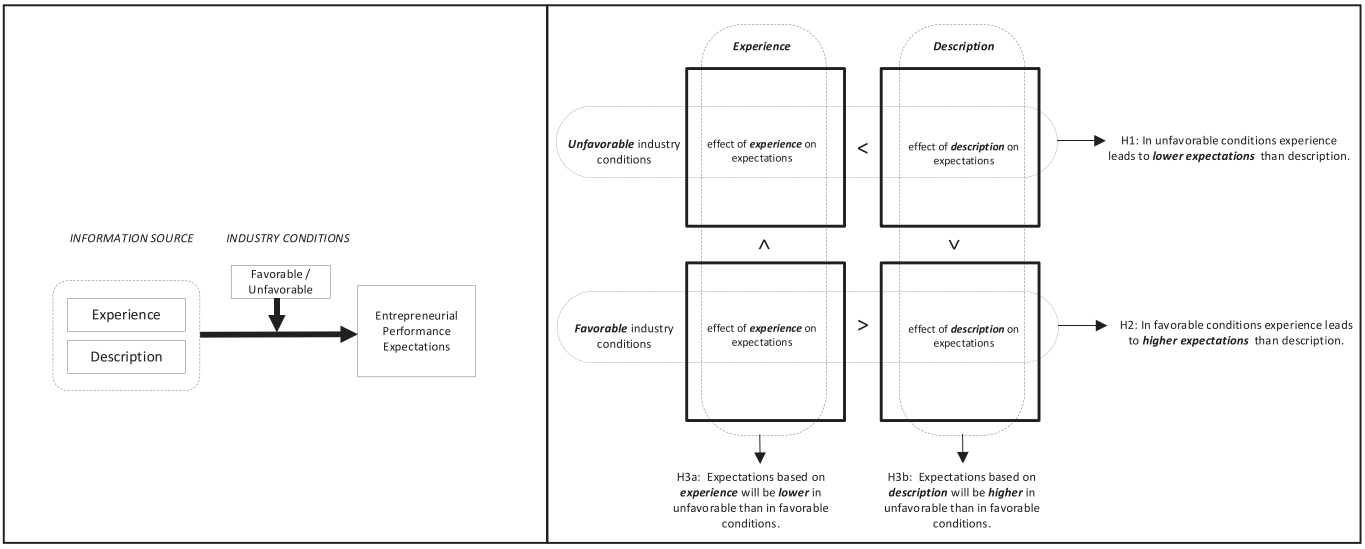

Fig. 2. Summary of hypothesized effects. On the left, the baseline model connects information source with performance expectations. Industry conditions interact with the baseline effect such that the effect of experience and description on performance changes in magnitude depending on industry conditions. On the right, the 2 by 2 matrix gives rise to four hypothesized effects. The sources of information (experience and description) are portrayed in the horizontal axis and industry conditions (favorable or unfavorable) in the vertical axis. H1 and H2 hypothesize effects *within* industry conditions, while H3a and H3b are *between* industry conditions. We use the signs >and < (within industry conditions) and ˆ and ∨ (between industry conditions) to express "greater than" or "smaller than", reflecting which source of information is expected to have a larger effect on performance expectations.

first built a variable called *Description*, which takes a value of 1 when the entrepreneur reports having made an effort to collect information about competitors or the market, and 0 otherwise. We built the dummy *Venture experience*, which takes the value 1 when an entrepreneur has prior startup experience as measured by the entrepreneur having started or helped start at least one new venture in the past and 0 otherwise (Ucbasaran, Westhead, Wright & Flores, 2010). The other experience type vastly studied in entrepreneurship research that serves as a valuable information source to identify business opportunities and their likelihood of success is the experience gathered in the industry as an employee of an established firm (Cassar, 2014). Consistent with the PSED II survey, to capture it, we built the dummy *Industry experience* (Cassar, 2014), which is coded as 1 if the entrepreneur has at least two years of experience in the industry (0 otherwise).

The favorable or unfavorable industry conditions at founding time were approximated by the respondents' evaluation of the competition level that their venture would encounter upon entry. Respondents could answer that there were "no other," "few," or "many" competitors offering a similar product in their target market at the time of entry. One advantage of this measure is that it captures the density of direct, local competition that an entrepreneur perceives in the specific geographic and economic market it targets. Traditional measures of competition such as industry concentration assume that all firms within the same industry and country face the same level of competition (e.g. Dedman and Lennox, 2009). This is problematic when we talk about nascent, small-scale ventures likely to focus on a local scope of competition (Reynolds, 2018), which is precisely the case among PSED II respondents: 92% of respondents expect to have less than 50 employees in five years. Thus, our measure has the advantage of capturing this situation in a way that general economic indicators do not (Dedman and Lennox, 2009)[2]. Consistent with our theoretical development, we created the variable *Industry conditions*, coded as 1 for *favorable* industry conditions when there are "few" competitors (Stage 2 in Fig. 1)—meaning that the product or service the new venture intends to sell is already known but direct competition is limited—and 0 in *unfavorable* conditions when there are "no other" or "many" companies offering a similar product (Stages 1 and 3 in Fig. 1).

Because self-reported evaluations of industry conditions could be correlated to the entrepreneur's expectations, we checked the correlation between our measure of industry conditions and *Expectations*, and the results show a low, negative, and non-significant relationship ($r = -0.04$; $p > 0.1$). Moreover, the effort to collect descriptive information could be endogenous to the perceived industry conditions (i.e., if an entrepreneur perceives no competition in the market, then he/she may not endeavor to collect descriptive information). We measured the correlation between *Description* and the industry condition, and observed a non-significant relationship ($r = 0.06$; $p > 0.1$).

We also controlled for other factors affecting performance expectations by including individual characteristics of the founder that can affect expectations, such as *Gender*, *Age,* and whether the entrepreneur has an educational level *Above college* (Cassar, 2014; Cooper et al., 1988; Puri & Robinson, 2007). We also included 17 *Sector* dummies because expectations further vary in different sectors depending on the scale of initial investment or financial support for entrepreneurship in specific sectors (Cassar, 2014). Moreover, we controlled for features of the venture creation process that affect income expectations: whether the entrepreneur has begun writing a *Business plan* (Parker & Belghitar, 2006), which reflects commitment to the new venture and could relate to high expectations; whether the entrepreneur is the *Sole owner* of the venture or whether various owners are involved as multiple ownership may introduce noise related to group dynamics that could influence expected performance (Parker & Belghitar, 2006; Baù, Sieger, Eddleston & Chirico, 2017); and finally, whether the startup has already generated sales of products or services, as it could affect the entrepreneurs' expectations for future performance (Parker & Belghitar, 2006). Table A1 in the Appendix provides a description of all variables and the corresponding PSED II items used to generate them.

3.3. Methodology

Because our study deals with the expectations at the founding time only, we used a cross-sectional, multiple regression on *Expectations* as

[2] For robustness, we conduct an additional study with primary data using a measure of industry conditions that is not self-reported (see Section "5. Study 2," page 27).

the dependent variable. To test how the effects of descriptive and experiential information sources interact with industry conditions and due to multicollinearity between industry conditions and sector dummies, we conducted a split sample moderating analysis (Eroglu, Machleit & Barr, 2005; Foltean, Trif & Tuleu, 2019). Running the analysis with the full sample and including an interaction term for each information source and industry condition in the model raises the variance inflation factor well beyond the acceptable level of 10 (Hair, Black, Babin & Anderson, 2005; Podoynitsyna, Van der Bij & Song, 2012). Consequently, we divided the sample into two by the variable *Industry conditions*. To determine whether the effect of one information source produces larger or lower expectations than the other source, we compared coefficients across regression models (Toh & Polidoro, 2013) through a *t*-test within and between industry conditions.

4. Study 1 results

Descriptive statistics and correlations for all variables used in the analyses appear in Table 1. The distribution of use of each information source is as follows: 65% of nascent entrepreneurs have used descriptive information, 78% have industry experience, 45% have startup experience, and 58% have both (description plus at least one of the two types of experience). The sample is almost equally split between favorable and unfavorable conditions. To check for the possibility of a reverse causal effect regarding the relationship between expectations and industry phase (e.g., if entrepreneurs with different expectations sort into different industry conditions), we performed a *t*-test of differences in means in the expectations variable by industry conditions and found no statistical difference: expectations are not statistically different in favorable and unfavorable conditions (difference = 0.62; $p > 0.1$).

We used a total of 1,105 individual observations: 526 and 579 corresponding to favorable and unfavorable industry conditions, respectively. Out of the 1,214 observations in the initial sample, 109 were missing values in the key variables for the analysis and were dropped from the analysis. Table 2 shows the results for "Favorable Industry Conditions" (Models 1–3) and "Unfavorable Industry Conditions" (Models 4–6). A first visual inspection of Table 2 suggests that the magnitude of the coefficients for experience and description behave in accordance with the hypothesized effects. In line with our baseline hypothesis, the results show that descriptive information consistently increases entrepreneurs' performance expectations with respect to those of entrepreneurs not relying on description. This effect is stronger (in effect size and significance level) in unfavorable than in favorable industry conditions. In unfavorable conditions (Models 4–6), this result is strongly significant ($p < 0.01$), while it is less significant and shows a smaller effect under favorable conditions (Models 1–3). Both venture and industry experiences positively affect performance expectations, although the effect of industry experience is not significant in unfavorable conditions (partially in line with our baseline argument). To examine H1 and H2—the relative strength of each information source on the dependent variable—we compared the coefficients of *Description* and both experience variables (*Venture* and *Industry*) within industry conditions. Our results have the predicted signs and are partially consistent with our hypotheses: in unfavorable conditions, description increases revenue expectations by 60.0% and 66.5% respectively compared to venture experience (+41.9%, difference not significant) and industry experience (+12.7%, $p = 0.06$), which is partially consistent with H1. This relationship is reversed in favorable conditions: venture experience increases revenue expectations by 76.8% and industry experience by 52.2% compared to description (+35% and + 39.1%, differences significant at the 0.10 level and not significant, respectively), lending partial support to H2.

To test H3a and H3b, we performed tests of equality of coefficients between industry conditions. Consistent with H3a, we find that the positive effect of experience on expectations is higher when conditions are favorable than unfavorable. For venture experience, the difference between coefficients under favorable and unfavorable conditions is positive but not significant (+76.8% in revenue expectations in favorable conditions vs. + 41.9% in unfavorable conditions, $p > 0.1$) and for industry experience, the difference is significant: (+52.2% in revenue expectations in favorable conditions vs. + 12.7% in unfavorable conditions, $p = 0.05$). H3b states that the effect of descriptive information on expectations is higher in unfavorable than in favorable conditions. This pattern is observed when comparing the coefficients in Models 1 and 4 and Models 2 and 5 but is not significant (+35% and + 39.1% in favorable conditions vs. + 60.0% and 66.5% in unfavorable conditions, but $p > 0.1$). The interactions of information source and industry conditions are plotted in Fig. 3.

In Models 5 and 6, we test the joint effect of description, venture experience, and industry experience on expectations. The pattern observed is similar to the one we observed with each experience type separately. It is interesting to note that *Venture experience* has a consistently and significantly higher effect on expectations than *Industry experience*.

Male entrepreneurs display higher expectations than females in the four models ($p < 0.01$), but age is not significant in any of the regressions. Sole ownership and formal business planning also increase performance expectations ($p < 0.01$), and owners of startups that have already generated sales display significantly lower performance expectations ($p < 0.01$ in the four models). This suggests that entrepreneurs tend to adjust their expectations downwards after receiving sales feedback. For robustness, we ran the same regressions treating the entrepreneurs who had already generated sales as having venture experience (i.e., coded as 1 in the venture experience dummy) and the results were consistent both in sign and magnitude.

An alternative explanation for the varying effect of each information source on expectations between industry conditions could be that those entrepreneurs who enter in favorable conditions differ from those

Table 1
Means, standard deviations and correlations (Study 1).

	Variable	Mean	Std. Dev.	Min	Max	1	2	3	4	5	6	7	8	9	10
1	Log expected revenues in 5y	11.79	1.98	5.3	20.03										
2	Description	0.65	0.48	0	1	0.14*									
3	Venture experience	0.45	0.5	0	1	0.16*	0.11*								
4	Industry experience	0.78	0.41	0	1	0.06*	0	0.01							
5	Gender	0.63	0.48	0	1	0.22*	−0.03	0.03	0.09*						
6	Age	43.56	12.94	18	83	−0.01	0.07*	0.28*	0	−0.038					
7	Business plan	0.49	0.5	0	1	0.18*	0.26*	0.05	0.05	0.03	−0.05				
8	Self owned	1.75	0.85	1	3	0.22*	0.07*	0.02	−0.09*	0.07*	−0.07	0.12*			
9	Sales	0.5	0.5	0	1	−0.13	* 0.08*	0.00	0.14*	−0.05	−0.01	0.05	−0.04		
10	Education	0.37	0.48	0	1	0.14*	0.13*	0.14*	0.02	−0.03	0.18*	0.15*	0.05	0.04	
11	Industry conditions	0.47	0.5	0	1	−0.04	0.06	0.03	0.03	−0.03	0.05	−0.03	0.03	−0.02	0.03

N = 1105; * denotes significant pairwise correlations ($p < 0.05$)

Table 2
Regression Results (Study 1)—Dependent Variable: Log(Expected Revenue in 5 Years).

	Favorable Industry Conditions								Unfavorable Industry Conditions							
	Model 1			Model 2			Model 3			Model 4			Model 5			Model 6	
	Coef.			Coef.			Coef.			Coef.			Coef.			Coef.	
Independent variables																	
Description	0.30	*	(0.16)	0.33	**	(0.15)	0.31	*	(0.16)	0.47	***	(0.17)	0.51	***	(0.17)	0.47	***	(0.17)
Venture experience	0.57	***	(0.15)				0.57	***	(0.15)	0.35	**	(0.17)				0.35	**	(0.16)
Industry experience				0.42	**	(0.18)	0.42	**	(0.18)				0.12		(0.19)	0.11		(0.09)
Control variables																		
Gender	0.77	***	(0.15)	0.73	***	(0.15)	0.73	***	(0.15)	0.63	***	(0.16)	0.64	***	(0.17)	0.63	***	(0.17)
Age	0.00		(0.00)	0.00		(0.01)	0.00		(0.01)	−0.01		(0.01)	0.00		(0.01)	−0.01		(0.01)
Business plan	0.65	***	(0.15)	0.62	***	(0.15)	0.63	***	(0.15)	0.42	**	(0.16)	0.43	***	(0.16)	0.41	**	(0.16)
Sole owner	0.36	***	(0.09)	0.39	***	(0.09)	0.39	***	(0.09)	0.33	***	(0.10)	0.34	***	(0.09)	0.34	***	(0.09)
Sales	−0.39	***	(0.15)	−0.41	***	(0.14)	−0.43	***	(0.15)	−0.61	***	(0.16)	−0.64	***	(0.16)	−0.62	***	(0.16)
Education	0.24		(0.15)	0.27	*	(0.16)	0.24		(0.15)	0.31	*	(0.17)	0.33	*	(0.18)	0.31	*	(0.18)
Sector dummies	yes			yes			yes			yes			yes			yes		
R^2	0.29			0.28			0.30			0.22			0.21			0.22		
N	526			526			526			579			579			579		

Note. Two-tailed tests; robust standard errors in parentheses.
* $p < 0.1$
** $p < 0.05$
*** $p < 0.01$

entering in unfavorable conditions in terms of opportunity costs (e.g., in favorable industry conditions, entrepreneurs could have higher opportunity costs and would only venture if they had high expectations). To check this possibility, we tested for differences in means across variables used as predictors of opportunity costs in the past (Cassar, 2006): experience (in both number of years in the industry and number of ventures created in the past), entrepreneur age, personal income prior to venturing, and education. The results show no difference in means for industry experience, venture experience, or entrepreneur age, income, or education. We only find a small difference in the entrepreneur age ($p = 0.04$) of 1.6 years, with those entering in favorable conditions being slightly older. Overall, this suggests that opportunity costs are not an important driver of our results.

We also tested whether the proportion of experienced to inexperienced entrepreneurs differed across industry conditions and found a non-significant difference, suggesting that our results are not driven by differences in the distribution of experienced to inexperienced entrepreneurs in favorable versus unfavorable conditions (aggregating all experience types, there were 87% and 89% of experienced entrepreneurs in unfavorable and favorable conditions, respectively, but $p = 0.35$; for venture experience only, the p-value of the difference is 0.16 and for industry experience is 0.54). This result supports our argument that opportunity costs do not seem to play out in our results, suggesting that they are not driven by differences in the type of entrepreneurs entering in different industry conditions.

We also compared expectations across entrepreneurs with lower and higher levels of experience. Within the sample of entrepreneurs who possess experience, the pairwise correlation between expectations and the number of prior ventures or years of industry experience is positive but rather small (0.17 and 0.12 for venture and industry experience, respectively), meaning that the linear association between experience and revenues is weak. We also performed a *t*-test analysis comparing the expectations of entrepreneurs with lower versus higher levels of experience. For venture experience, we divided the sample into those who possess between one and three prior venture experiences (lower), and those with four or more (higher). The test yielded a small, significant difference in the log of expected revenues (12 vs. 12.7; $p = 0.02$). For industry experience, we divided the sample into those who possess between one and 10 years of industry experience (lower), and those with 11 or more (higher). Again, the test yielded a small but significant difference (11.7 versus 12.1; $p = 0.03$). The same results were obtained using different thresholds for lower and higher experience, which is consistent with the small positive correlation between expectations and amount of experience.

We further compared the difference in reliance on descriptive information for experienced entrepreneurs only (i.e., when venture or industry experience equals 1) in favorable and unfavorable conditions to check whether the motivation to search for information differed among experienced entrepreneurs and across conditions. The reliance on description among entrepreneurs with startup experience is not statistically different in favorable and unfavorable industry conditions (0.7 vs. 0.71, $p > 0.1$). In the case of industry experience, there is a small but only marginally significant difference in the reliance on descriptive information depending on the industry conditions (0.62 vs. 0.67, $p = 0.09$). Overall, we interpret these results as showing no substantial differences.

A potential concern in this analysis is the self-reported nature of the industry conditions measure, which could be argued to affect the above results. We therefore proceeded to collect new data to verify the robustness of our findings using a different measure of industry conditions that is not self-reported. Obtaining similar results in both studies would show that industry conditions perceived by entrepreneurs and assessed by external evaluators have the same moderating effect on the relationship between information source and entrepreneurial expectations.

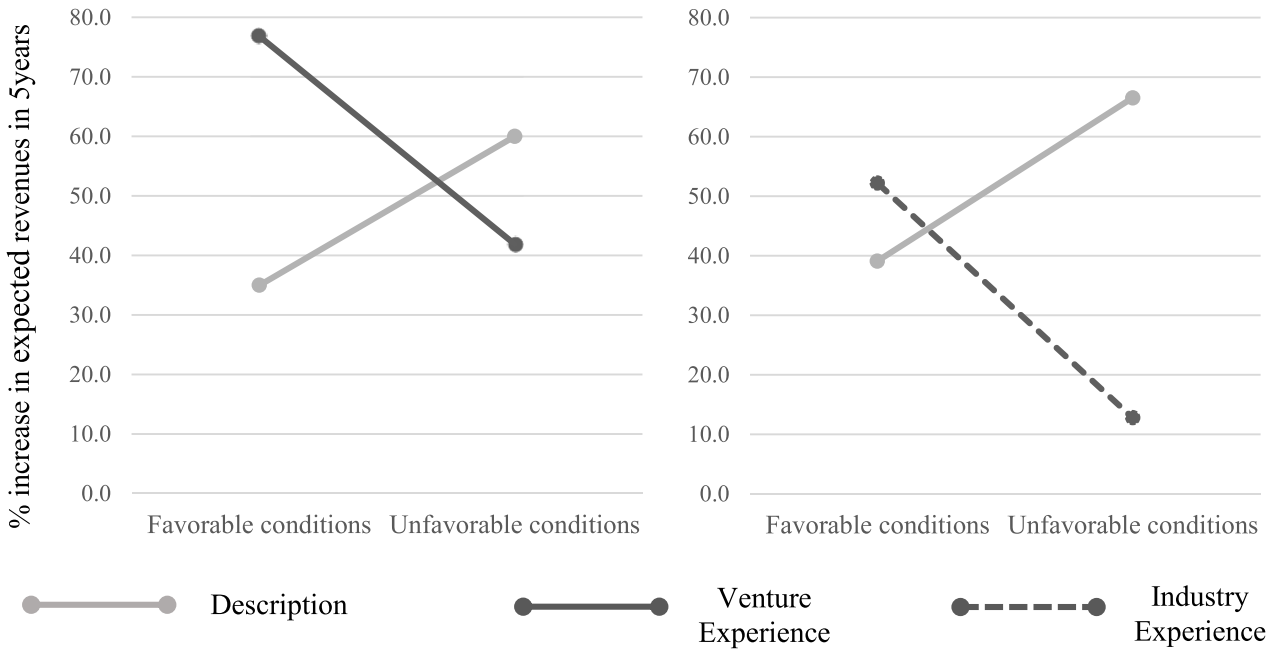

Fig. 3. Plot from Study 1. Expected revenues in 5 years and sources of information. In this plot we observe the percentage increase in expected revenues in 5 years when entrepreneurs use the different sources of information on the Y-axis and industry conditions on the X-axis. In the left panel the effects of description and venture experience are compared across favorable and unfavorable conditions. In the right panel, the effects of description and industry experience are compared, also across industry conditions.

5. Study 2

5.1. Study 2 data

In a second study, we collected primary data from a sample of 160 students from a top European business school who wrote a standard business plan as a prerequisite for graduation. In these business plans, students had to provide detailed financial forecasts and state whether they had experience in the industry or in previous startups, among other variables of interest. Students were either senior undergraduate students in business or graduate students enrolled in business master's programs. We deliberately included both graduate and undergraduate students to capture variability in industry and startup experience. Students in these programs were encouraged to write a business plan as their final project (i.e., the equivalent of an undergraduate or master thesis) only if they had serious intentions to pursue those projects after graduation. This suggests that the students in the sample had a genuine motivation to engage in entrepreneurship. Students had to conduct a market and industry analysis. To do so, they had to access descriptive information from potential customers, suppliers, field experts, and other relevant stakeholders. Students also had to craft a minimum viable product and test it to validate key hypotheses about product features.

Because of data protection regulations, we contacted the students through email requesting permission to use their business plans for research purposes. Out of the 210 emails sent, 164 students replied. Only four denied permission. Out of the 160 business plans, 16 did not report either income expectations for five years or their experience in the industry, leaving us with a final sample of 144 usable business plans. The financial and background information from each was then coded to create a new database. Because these business plans were meant to evaluate, among other things, the students' capacity to search for information related to their business opportunity, all students in the sample had access to descriptive information to complete the business plan. Therefore, the variable *description* is held constant in the analysis, and students who had experience also had descriptive information, which allows us to test the following: how do expectations vary between founders who only have description versus those with description *and* experience? This setting may represent a more habitual situation: in real life, entrepreneurs can often access descriptive and experiential information simultaneously (the default condition in Study 2). Studies have shown that individuals with access to both experience and description tend to downplay description in favor of experience and behave as if they had access to experience only (Lejarraga, 2010; Lejarraga & Gonzalez, 2011). This suggests that our hypotheses on the effects of experience should also hold in situations where entrepreneurs simultaneously have experience and description in the same way as when they only have experience. Table 3 shows the descriptive statistics for the sample.

5.2. Variables

The variables were constructed following the same criteria as in the first study. We measured *Expectations* with the logarithm of expected revenues in five years reported in the financial projections section of the business plans. *Venture experience* is a dummy equal to 1 if the student claims to have worked at or started a new venture in the past, and *Industry experience* equals 1 if they had at least two years of experience in the industry in which they were venturing. Importantly, in both experience variables, the value 0 means that the student has only gathered descriptive information. The variable *Industry conditions* was assessed by two entrepreneurship scholars who acted as independent coders and categorized all business plans as being in either "favorable" or "unfavorable" conditions. The coders agreed on 94% of their separate evaluations. In the remaining 6%, all discrepancies were solved by a round of deliberation among the raters. Coders were asked to determine the industry conditions for the average firm in the industry (i.e., favorable or unfavorable for an average venture entering that industry at that time), not for the particular business opportunity described in the business plan. We included the same controls as in the first study.

5.3. Study 2 analysis and results

Table 4 shows the results of the regression analyses. We first conducted the analysis with split samples for comparison with Study 1, in

Table 3
Means, standard deviations and correlations (Study 2).

	Variable	Mean	Std. Dev.	Min	Max	1	2	3	4	5	6
1	Log expected revenues in 5y	13.88	1.75	9.55	19.48	1					
2	Venture experience	0.18	0.39	0	1	0.04	1				
3	Industry experience	0.31	0.46	0	1	−0.09*	0.11*	1			
4	Gender	0.71	0.45	0	1	−0.08*	0.12*	0.01	1		
5	Already started	0.05	0.22	0	1	−0.03	0.19*	0.22*	0.02	1	
6	Industry conditions	0.38	0.49	0	1	−0.05	0.04	0.16*	−0.02	0.18*	1

N = 144; * denotes significant pairwise correlations ($p < 0.05$)

which we also split the sample by industry conditions, and then with the full sample and interaction terms since the new data does not present problems of multicollinearity between industry type and conditions. For further comparison, we also report the results for Studies 1 and 2 side by side in Table 5.

Because, by default, all students have gathered descriptive information to write the business plan, the interpretation of the experience dummies slightly differs from the previous analysis. Here, when the experience dummies take value 0, this reflects reliance on description alone (i.e., the entrepreneur has no experience but has searched for descriptive information to complete the business plan). The first columns of Models 1 and 2 test the effect of venture and industry experience, respectively, on expectations in unfavorable conditions. The negative coefficients show that, consistent with H1, experience generates smaller expectations than description alone in unfavorable conditions. The second columns in Models 1 and 2 test the same effect in favorable conditions. Consistent with H2, both models show positive signs for experience compared with description alone, but the coefficient is only significant for venture and not industry experience. These findings lend support to our initial results. In the full-sample models (Models 3–5), we introduced an interaction term of *Favorable conditions* × *Venture experience* and *Favorable conditions* × *Industry experience*. In Model 3, we focus on *Venture experience*, in Model 4, on *Industry experience*, and Model 5 combines both experience types. The three full-sample models display a positive and significant effect of the interaction of industry conditions and experience on expectations, meaning that, consistent with H3a, having experience produces larger expectations in favorable conditions than in unfavorable conditions. Finally, the *Favorable conditions* dummy is negative and significant in Models 3–5, showing that, consistent with H3b, entrepreneurs with descriptive information have lower expectations in unfavorable than favorable conditions. Altogether, these results lend evidence of replicability to our initial findings. As shown in Fig. 4, the results indicate that compared to description only, industry and venture experience increase expectations by 15% and 239%, respectively, in favorable conditions, but reduce them by 81 and 67%, respectively, in unfavorable conditions.

Table 5 summarizes the tests comparing coefficients both within and between industry conditions for the two studies.

6. Discussion

This paper examines how entrepreneurial expectations of success at the pre-entry stage are affected by the information source—be it experience or descriptions—through which entrepreneurs learn about their business opportunity. We show that entrepreneurs' income expectations are not only shaped by the information source but also by its interaction with the industry conditions in which expectations are formed. Consistent with the findings reported in the description–experience literature (Hertwig et al., 2004; Hertwig & Erev, 2009), we find that expectations of success vary mostly as if experience and descriptive information led entrepreneurs to underweight and overweight, respectively, entrepreneurial success (the focal low-probability event).

Throughout the paper, we highlight that entrepreneurs' experience matters and differs from descriptive information in a way that has previously been overlooked in the entrepreneurship and organizational literature. Previous studies have mostly used resource-based arguments to assert that experience matters because it provides new firms with improved managerial skills (Wright, Westhead & Sohl, 1998), larger funding (Kaplan & Stromberg, 2003), an increased range of search activity (Rosenkopf & Almeida, 2003), better pattern recognition skills, cognitive frameworks (Baron & Ensley, 2006; Corbett, 2005), and higher entrepreneurial performance (Stuart & Abetti, 1990). Our results provide partial evidence that experience does not produce invariably higher expectations as both the resource-based view and the cognitive biases literature would suggest. Rather, the effect of experience on expectations seems to change depending on the industry conditions, which determine the likelihood of success. This result suggests that the information source renders entrepreneurs sensitive to the underlying probabilities of success in a way that is consistent with the description–experience gap (Hertwig et al., 2004). This explanation goes beyond the established, unidirectional relationship between experience and expectations assumed by prior studies, where the implicit prediction was that experience would positively and monotonically increase expectations of success (Hmielesky & Baron, 2009).

Our findings are in line with a basic tenet of cognition scholarship (Hmieleski & Baron, 2009) that suggests that understanding cognition-related variables (e.g., expectations) can only be attained by considering the interaction of behavioral and environmental factors (Bandura, 1986; Lejarraga & Pindard-Lejarraga, 2020). We illustrate how differences in the information source used during the entry decision-making process interact with an environmental feature—industry conditions—to shape entrepreneurs' performance expectations.

Additionally, the entrepreneurship literature influenced by studies on cognitive biases has traditionally described entrepreneurs as having exceedingly high expectations of success (Thomas, 2018), which is consistent with overweighting the small probability of success. However, several studies propose that this view is not stable among entrepreneurs (Lowe & Ziedonis, 2006; Hogarth & Karelaia, 2012; Chen et al., 2018). We revisit this view to provide a more nuanced interpretation of how and when entrepreneurs may "inflate" or "deflate" their performance expectations. If the information source affects how entrepreneurs perceive their chances of success, it could help explain why optimism in terms of performance expectations is not consistently observed and varies depending on the information source and context.

Finally, what happens when entrepreneurs have access to both sources of information? Previous research has shown that information provided by experience can overwhelm descriptions, making experience the preferred information source when both are available (Jessup, Bishara & Busemeyer, 2008; Lejarraga and Gonzalez, 2011; Weiss-Cohen, Konstantinidis, Speekenbrink & Harvey, 2016). Consistent with this stream of research, we checked for the effect of using both information sources on performance expectations in Study 1. The pattern observed for entrepreneurs using both information sources is that they produce higher expectations in favorable (coef.: 1.07) than in unfavorable industry conditions (coef.: 0.45), mimicking the pattern depicted by either experience variable (i.e., higher expectations in favorable than in unfavorable industry conditions), with the difference that in both industry conditions, expectations were substantially higher than those produced by either experience alone. In Study 2, all entrepreneurs have access to either description or both information sources

Table 4
Regression Results (Study 2)—Dependent Variable: Log(Expected Revenue in 5 Years).

Regression models with split sample (Models 1 and 2) and full sample (Models 3 to 5)

	Model 1					Model 2					Model 3			Model 4			Model 5		
	Unfavorable Coef.			Favorable Coef.		Unfavorable Coef.			Favorable Coef.		Full sample Coef.			Full sample Coef.			Full sample Coef.		
Independent variables																			
Venture Experience	−1.1	*	(0.55)	1.34	*	(0.66)	–			–			−1.11	**	(0.50)	–			−1.19	**	(0.48)
Industry Experience	–			–			−1.71	***	(0.45)	0.26		(0.77)	–			−1.64	***	(0.44)	−1.68	***	(0.43)
Favorable conditions													−0.72	**	(0.33)	−0.71	*	(0.35)	−1.08	***	(0.36)
Favorable conditions × Venture Experience													2.33	***	(0.75)	–			2.37	***	(0.72)
Favorable conditions × Industry Experience													–			1.68	**	(0.65)	1.44	**	(0.63)
Control variables																					
Gender	0.28		(0.49)	−0.09		(0.58)	0.10		(0.45)	0.19		(0.60)	0.09		(0.34)	0.10		(0.33)	0.17		(0.33)
Already started	−0.67		(2.10)	0.31		(0.95)	−0.34		(1.96)	1.18		(1.08)	−0.18		(0.76)	0.40		(0.74)	0.27		(0.75)
Sector dummies	yes			yes			yes			yes			yes			yes			yes		
Year dummies	yes			yes			yes			yes			yes			yes			yes		
R^2	0.28			0.37			0.37			0.3			0.27			0.29			0.35		
Change in R^2	0.04	*		0.07	*		0.13	***		0.01			0.07	***		0.09	**		0.15	***	
N	91			53			91			53			144			144			144		

Note. Two-tailed tests; robust standard errors in parentheses.
* $p < 0.1$.
** $p < 0.05$.
*** $p < 0.01$.

Table 5
Summary of the hypotheses and results of Studies 1 and 2.

Hypotheses	Prediction	Study 1	Study 2 (full sample)
H1	$E_U < D_U$	E(venture): −19% E(industry): −54%*	E(venture):-67%** E(industry):-81%**
H2	$E_F > D_F$	E(venture):+42%* E(industry): +13%	E(venture): +239%*** E(industry): +15%
H3a	$E_U < E_F$	E(venture): −35% E(industry): −40%**	E(venture): −90%*** E(industry): −86%***
H3b	$D_U > D_F$	+27%	+66%***

E denotes experience, D description, and the subscripts U and F refer to unfavorable and favorable conditions, respectively.
* $p < 0.1$; ** $p < 0.05$; *** $p < 0.01$. We report the size of the effects in percent change in expected revenues and their statistical significance.

and the results are similar: simultaneously having experience and descriptive information increases expectations in favorable conditions but reduces expectations in unfavorable conditions, and, by contrast, having descriptive information alone produces the opposite effects. Interestingly, while venture and industry experience have similar effects on expectations (in the direction of the effect and in the way it interacts with industry conditions), venture experience appears to produce slightly higher performance expectations than industry experience. This result is in line with Cassar's (2014) finding that entrepreneurs with startup experience are significantly more overoptimistic than those with industry experience, suggesting the acquisition of industry experience is a way for entrepreneurs to improve forecast accuracy.

6.1. Implications

If entrepreneurs' expectations of success differ depending on the information source on which they rely to decide whether to enter an industry, post-entry performance of nascent firms may also continue to be affected by the initial expectations and therefore by the information source used at founding time. To understand the process by which organizations establish and form a representation of their environment, scholars have sought to shed light on the initial stages of the founding process in which nascent entrepreneurs resort to their social, cultural, and economic environments to establish new organizations. Although cognitive factors have been underexplored as key influences of an organization's imprinting process, the optimistic behavior adopted by an organization at founding time is likely to become imprinted over time (Stinchcombe, 1965) as suggested by studies looking at the long-lasting effect of initial strategy (Bamford, Dean, & McDougall, 2000), organizational behavior (Boeker, 1989) or choice of alliance partners (Milanov & Fernhaber, 2009) adopted at founding time. Knowing that entrepreneurs' expectations of success differ significantly depending on the information source they use when evaluating whether to enter an industry can provide insights into the subsequent behavior of nascent firms insofar as they are affected by initial expectations.

Our results suggest that entrepreneurs should be aware of the reasons they are attracted to a particular industry. Are they attracted because their experience in that industry suggests that good opportunities abound, or because they have heard or read about promising opportunities in the industry? The information source through which they learn about these opportunities systematically affects their expectations. In unfavorable industry conditions, newcomers that base their performance expectations on descriptive information and hence overweigh the probability of success may end up disappointed, while those basing their expectations on experience and entering the market with lower expectations may be positively surprised by the actual performance. To the degree that expectations at entry time serve as a threshold to determine survival or exit (Gimeno, Folta, Cooper & Woo, 1997), realizations of actual performance below or above expectations at entry time may affect the proportion of survivors who are experienced, potentially affecting the industry direction. Being aware of this pattern can prompt

Table A1
Definition of variables of Study 1, using PSED II data.

Variable name	Definition	Previously used in the literature	PSED II question source
Expectations	Logarithm of expected annual revenue from sales (in dollars) in five years.	Cassar (2010); Tietz, Lejarraga and Pindard-Lejarraga (2021)	A.T3
Description	Dummy variable identifying whether the entrepreneur has relied on descriptive information. It takes a value of 1 when the entrepreneur reports having made an effort to collect information about competitors or about the market, and 0 otherwise.	Adapted from Cooper, Folta and Woo (1995)	A.D20; A. D22
Venture experience	Dummy variable identifying whether the entrepreneur had experience in previous new ventures. It takes the value 1 when an entrepreneur had prior startup experience as measured by the entrepreneur having started or helped start at least one new venture in the past, and 0 otherwise.	Ucbasaran, Westhead, Wright and Flores (2010)	A.H12
Industry experience	Dummy variable identifying whether the entrepreneur had work experience in the industry. It takes value 1 if the entrepreneur had at least two years of experience in the industry, 0 otherwise.	Cassar (2014)	A.*H*11
Indusrty conditions	Industry conditions are labeled as *favorable* if respondents identified their industry as having 'few' competitors. Industry conditions are labeled as *unfavorable* if respondents identified their industry as having 'none' or 'many' competitors.	Consistent with density-dependent models (Carroll and Hannan, 1989a,b)	A.S2
Gender	Dummy variable indicating whether the founder is male.	Puri and Robinson (2007); Cassar (2014)	A.H1
Age	The age of the founder in years	Puri and Robinson (2007)	A.H2
Business plan	Dummy variable taking value 1 if the founder had started to write a business plan (whether formal or informal); 0 otherwise.	Parker and Belghitar (2006)	A.D1
Sole owner	Discrete variable indicating whether the new ventures is owned individually (value 1), by the founder and spouse (value 2), or by founder and others (value 3).	Parker and Belghitar (2006)	A.G1
Income	Dummy variable taking value 1 if the venture has already received income from the sale of goods or services; 0 otherwise.	Parker and Belghitar (2006)	A.E13
Education	Dummy variable taking value 1 if the founder has a college degree or higher; 0 otherwise.	Cooper, Woo and Dunkelberg (1988)	A.H6
Sector dummies	Dummy variable indicating the belonging of the venture to one of the 16 sectors identified.	Parker and Belghitar (2006)	A.B1

collaborations with other entrepreneurs who complement the team with other information sources. For instance, experienced entrepreneurs may seek to collaborate with inexperienced, highly informed entrepreneurs, whereas new entrepreneurs may look for partners with experience.

6.2. Limitations and future research

This article only focuses on two broad categories of information sources that include other sub-categories that may have a finer-grained influence on expectations if studied separately. In this regard, our variable capturing descriptive information is limited. Our operationalization treats every piece of information generated by third parties as belonging to the same information source type. This measure may confound information sources that may differ qualitatively, such as industry reports and vicarious learning from close competitors or family members, all of which are generated by third parties. Moreover, some entrepreneurs might only have collected information about competitors and not about how the market functions. Furthermore, in Study 2, descriptive information is kept constant and the only source of variability is industry or venture experience. While it provides evidence of the effect of joint versus single information sources, it does not allow for finer-grained categorization of the information. Similarly, we lack information about whether past experiences of founders have been successes or failures. However, past empirical findings suggest that experience has a consistent effect on serial entrepreneurs independent of the success or failure of their past ventures (e.g. Paik, 2014), providing theoretical grounds for our operationalization. With respect to this variable, future research could be more precise about the specific pieces of descriptive information collected and evaluate their individual effects on expectations.

Further research could go beyond the identification of the information source and explore the breadth and depth of information searches (Fiet et al., 2013; Patel & Fiet, 2009; Patel & Van der Have, 2010; Westhead et al., 2009) and their relationship to expectations. Would certain amounts of descriptive information equate to a specific amount of experience? This question would require adopting theoretical frameworks different from the one proposed in this paper: the difference in the amount of information gathered may relate to motivation, effort, confirmation biases, or frameworks related to the depth–breath tradeoffs in the entrepreneurship literature (Fiet et al., 2013; Patel & Fiet, 2009). It is likely that extensive experience (or searches for descriptive information) would produce different expectations than little experience. Likewise, it would be interesting to explore how different information sources are integrated within a team whose members have access to different sources or the effect of information sources beyond the formation of expectations to understand how they may affect actual performance.

Another limitation of this research comes from the measurement of the industry conditions variable. Although the advantage of our self-reported measure is its focus on the relevant market instead of regional or national measures, this measure may not capture differences in the carrying capacities of specific markets (i.e., the number of firms they have the capacity to sustain profitably) (Hannan & Freeman, 1977, 1987). For example, an oligopolistic industry may have important barriers to entry and be in less favorable conditions for an incumbent than

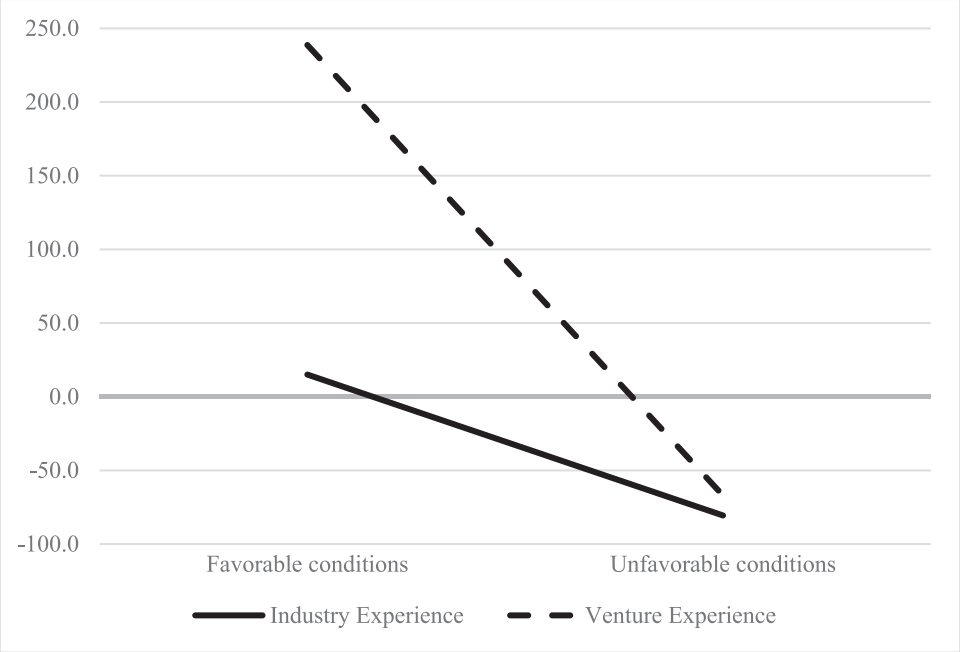

Fig. 4. Plot from Study 2. Percentage of change in expected revenues in 5 years by sources of information and industry conditions. In this plot we observe the percentage of change in expected revenues in 5 years when entrepreneurs have venture or industry experience (versus descriptive information only) on the Y-axis and industry conditions on the X-axis.

another industry with more competitors but more potential for growth in some local markets. However, Study 2 reveals similar results with a measure that is not self-reported.

Our studies provide a different viewpoint for why entrepreneurs may enter a market with different risk-taking attitudes and set an anchor to an initial expectation that may not be easily changed as new information is gathered. An interesting extension of our studies would be to explore the subsequent path-dependent behavior of new ventures as a function of the information source consulted at founding time and to investigate whether the initial risk-taking behavior adopted by the founders imprints to nascent organizations. Among the multiple factors affecting the persistence of initial behavior in new firms, it is likely that selection pressures occurring along the industry life cycle reinforce survivors' commitment to their initial risk-taking behavior and create path dependencies that become difficult to eliminate. That is, if founding entrepreneurs enter an industry pursuing an aggressive (conservative) strategy and survive, they will likely continue to behave aggressively (conservatively) because this strategy can easily—and subjectively—be linked to the initial success. Similarly, future research could examine the actual survival rates or other performance measures of entrepreneurs as a function of information sources or the composition of different cohorts along the industry life cycle in terms of experienced and inexperienced entrepreneurs and also compare the gap between expected and actual performance to determine how this gap relates to the information source, expanding the existing research on forecasting accuracy (Landier, Sraer & Thesmar, 2009; Cassar, 2014).

Lastly, future research could explore the differences in expectations between ventures started as a sole ownership versus as a joint tenancy. While sole owners can more readily rely on their own experiences and even gut feelings without the need to coordinate with or convince co-founders to estimate future revenues, teams of founders have to coordinate and engage in intra-group negotiations which may require descriptive information to convince co-founders, leading to different expectations (Klotz, Hmieleski, Bradley & Busenitz, 2014; Lejarraga, Lejarraga & González, 2014).

7. Conclusion

In two studies, we show evidence that entrepreneurs' performance expectations vary as a function of the information source they consult. Moreover, the relationship between information source and expectations is moderated by industry conditions that determine when entrepreneurial success has a low probability or is more frequently observed. In favorable industry conditions, experience tends to generate higher expectations than descriptive information, whereas in unfavorable industry conditions, experience tends to generate lower expectations than descriptive information. Viewing experience as a distinct type of informational input from descriptive information, which changes how entrepreneurs perceive low-probability events, is a new and valuable way of conceiving its relationship to entrepreneurial behavior. Because expectations are a vital force driving entrepreneurs' motivation to progress towards an operating venture, understanding how informational inputs affect expectations is important for entrepreneurs and policy-makers who want to boost entrepreneurial motivation. We find that the description–experience gap also emerges outside the lab in entrepreneurial contexts where probabilities are ill-defined, making the information source a potentially relevant variable in multiple business contexts. This is important because many of the desired outcomes in organizations at the individual (e.g. promotion tournaments) or the firm level (e.g. long-term survival, sustained competitive advantage) are low-probability events with ill-defined probability distributions. Knowing how the information source affects mental representations of low-probability outcomes is key to our understanding of the heterogeneity in individual and organizational expectations.

CRediT authorship contribution statement

Maud Pindard-Lejarraga: Methodology, Funding acquisition, Data curation, Formal analysis, Conceptualization, Investigation, Writing – original draft, Writing – review & editing. **José Lejarraga:** Software, Resources, Project administration, Investigation, Funding acquisition, Conceptualization, Formal analysis, Supervision, Writing – original draft, Writing – review & editing.

Declaration of Competing Interest

The authors declare that they have no known competing financial interests or personal relationships that could have appeared to influence the work reported in this paper.

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