Journal of Small Business Management

ISSN: (Print) (Online) Journal homepage: https://www.tandfonline.com/loi/ujbm20

Getting to the one: Prioritizing an idea set using preference-based decision-specific heuristics

Daniel R. Clark, Matthias A. Tietz & Maya Kumar

To cite this article: Daniel R. Clark, Matthias A. Tietz & Maya Kumar (2022): Getting to the one: Prioritizing an idea set using preference-based decision-specific heuristics, Journal of Small Business Management, DOI: 10.1080/00472778.2022.2082454

To link to this article: https://doi.org/10.1080/00472778.2022.2082454

Published online: 29 Jun 2022.

JOURNAL OF SMALL BUSINESS MANAGEMENT
https://doi.org/10.1080/00472778.2022.2082454

Getting to the one: Prioritizing an idea set using preference-based decision-specific heuristics

Daniel R. Clark [a], Matthias A. Tietz [b], and Maya Kumar [c]

[a]Ivey Business School, Western University, London, Ontario, Canada; [b]St.Gallen Institute of Management in Asia, University of St.Gallen, Singapore and Switzerland; [c]Department of Entrepreneurship, IE Business School, IE University, Spain

ABSTRACT

We propose and test a process where potential entrepreneurs (PEs) prioritize a venture idea consideration set using preference-based decision-specific heuristics to assess idea feasibility and desirability. We test our hypotheses through two studies with PEs. The first experiment shows that prioritization occurs, with 113 of 122 PEs voluntarily changing a randomized list of their ideated ventures into a rank-ordered priority list of potential opportunities. Second, we employ a novel "equivocal forced-choice" conjoint design with 250 PEs. We find empirical support that PEs prioritize via relative preferences for experience-based knowledge, strong social ties, and low risk/low reward venture ideas. We contribute to the entrepreneurship literature by theorizing and providing evidence of a prioritization stage for multiple idea sets before evaluation. Further, we demonstrate the influence of individual and social network factors on prioritization and expand our understanding of how PEs conceptualize risk in venturing.

KEYWORDS

Cognition; entrepreneurship; prioritization process; decision specific heuristics; equivocal forced-choice conjoint analysis; feasibility; desirability

Introduction

Turning an idea into an opportunity is fundamental to the entrepreneurial process (Hoyte et al., 2019; Vogel, 2017). However, at any given time, an individual may have several ideas in her or his mind (Hill & Birkinshaw, 2010). These ideas form when individuals – aiming to solve great problems (Weinberger et al., 2018) and achieve great innovations (Heunks, 1998) – engage in ideation (for example, Grégoire & Shepherd, 2012; Gruber et al., 2013; Kier & McMullen, 2018). While having more ideas increases the likelihood that the final chosen opportunity is of high quality (Gruber et al., 2013; Kier & McMullen, 2018), choosing which opportunity to pursue among a set of ideas is a challenging evaluation task (Bakker & Shepherd, 2017; Grégoire & Shepherd, 2012).

Ultimately, an individual makes a judgment on whether an opportunity is attractive to pursue (Haynie et al., 2009; Williams & Wood, 2015; Wood et al., 2014; Wood & Williams, 2015). However, as Shepherd and Gruber (2020, p. 5)

CONTACT Daniel R. Clark dclark@ivey.ca Ivey Business School, Western University, London, ON N6G 0N1

pointed out, "the notion that entrepreneurs identify a portfolio of opportunities ... and select their favorite opportunity from that set gives rise to a number of important questions." That is, there is an insufficient understanding of how individuals move from having multiple potential ideas to a single opportunity for exploitation (Hill & Birkinshaw, 2010). Therefore, this paper explores an intermediate stage – prioritization – that connects the earlier stage of recognizing multiple ideas with the later, cognitively demanding opportunity evaluation stage (Bryant, 2007). We theorize that during this intermediate stage, entrepreneurs prioritize potential ideas within their idea set (Hill & Birkinshaw, 2010) using preference-based decision-specific heuristics. This step thereby informs which ideas they either further develop or choose not to pursue (Scheaf et al., 2020; Wood & McKelvie, 2015). Thus, the research question for this paper is, *how do potential entrepreneurs employ preference-based decision-specific heuristics to prioritize ideas within an idea set?*

Prior research has shown that entrepreneurs employ perceptions of feasibility and desirability in their decision-making (Fitzsimmons & Douglas, 2011; McMullen & Shepherd, 2006). To make rapid assessments of feasibility and desirability, one useful source of decision-specific heuristics are their preferences for the criteria used to ideate potential ventures (herein preferences); an easily accessible (thus low cognitive effort) mechanism for decision-making (Brans & Vincke, 1985; Hauser, 2014). Once individuals generate multiple potential ideas, to save cognitive effort, they revisit the criteria they employed to ideate the potential ideas and use their preferences regarding those same criteria to prioritize the ideas in the idea set before choosing the potential opportunity to exploit. As a starting point to test our model, we employ the prototypical ideation inputs knowledge, social ties, and risk/reward profiles (Baron & Ensley, 2006; Sarasvathy, 2001; Shepherd & DeTienne, 2005) as preferences. These three are not exhaustive but are frequently cited both for playing a role in ideation and opportunity evaluation (for example, Gruber et al., 2012; Ko & McKelvie, 2018), and thus inform decision-specific heuristics in the intermediate stage of prioritization.[1]

We tested our theoretical model with two separate, complementary empirical studies on potential entrepreneurs (PEs). Following Krueger and Brazeal (1994), we consider PEs to be individuals with a stated interest in entrepreneurship who are considering entrepreneurial ideas but have yet to commit to an entrepreneurial career. Study 1, involving 122 PEs generating up to seven ideas each, was designed to first provide evidence of whether prioritization occurs. Study 2 employs a novel form of conjoint design featuring the

[1]Our model is not influenced directly by specific ideation inputs, or the preferences therein. We employ knowledge, social ties, and risk/reward profiles here as prototypical ideation inputs to test the model, however, theoretically, any ideation input would have preferences associated with it that could be employed by the PE to form decision-specific heuristics.

equivocal forced choices of 250 (different) PEs making 2,000 decisions. These decisions involved forcing the PEs to trade-off their preferences in connection with idea prioritization; we test their preferences for types of knowledge, social ties, and risk/reward profile. Given the novelty of our experimental methods, we detail a series of robustness checks we undertook to validate our findings.

Our work makes three contributions. First, regarding entrepreneurial processes, we theorize and find evidence for the existence of a prioritization stage where PEs employ their relative preferences to prioritize ideas. Using decision-making theory (Hauser, 2014), we bridge the notion of an individual's generation of multiple ideas (Hill & Birkinshaw, 2010; Sarasvathy, 2001) and the cognitive demands placed therein on an individual's formal analytical opportunity evaluation (Scheaf et al., 2020). As such, we cover the process from the formation of an idea set to using idiosyncratic preferences to form decision-specific heuristics to prioritize ideas and reduce the idea set before final evaluation, helping researchers and entrepreneurs cognize which ideas are being promoted or rejected and why.

Second, we address the call for research on multiple ideas to assess the influence of individual and social network factors on determining which ideas are acted upon or discarded (Hill & Birkinshaw, 2010). We theorize and find that these criteria used in the ideation process are revisited in the prioritization stage. PEs consider their human capital when ideating and subsequently use their relative preferences for different types of human capital to evaluate the ideas they have generated. Where previous research has focused on the direct effects of individual capital on outcomes (for example, Davidsson & Honig, 2003; Matricano, 2016), our model offers the insight that an individual's preference for different types of human capital affects subsequent idea prioritization.

Third, we expand our understanding of how PEs conceptualize risk in venturing. Previous research has focused on the strong effect of the worst-case scenario on venture decision-making (for example, Forlani & Mullins, 2000; Mullins & Forlani, 2005; Wood & Williams, 2015). Our findings shed additional light on how individuals conceptualize downside risk (Palich & Bagby, 1995). Sarasvathy (2001) argued that individuals consider affordable loss – the total loss of all time and resources (Dew et al., 2009) – as the first criterion for ideas. However, we theorize and empirically demonstrate that individuals are willing to limit gains to preserve resources with an expected loss logic, rather than necessarily assuming a total loss and attempting to maximize gains against potential total loss. At least for prioritizing an idea set, certain individuals employ decision-making logic more consistent with the probability of loss and gain than the affordability of total loss.

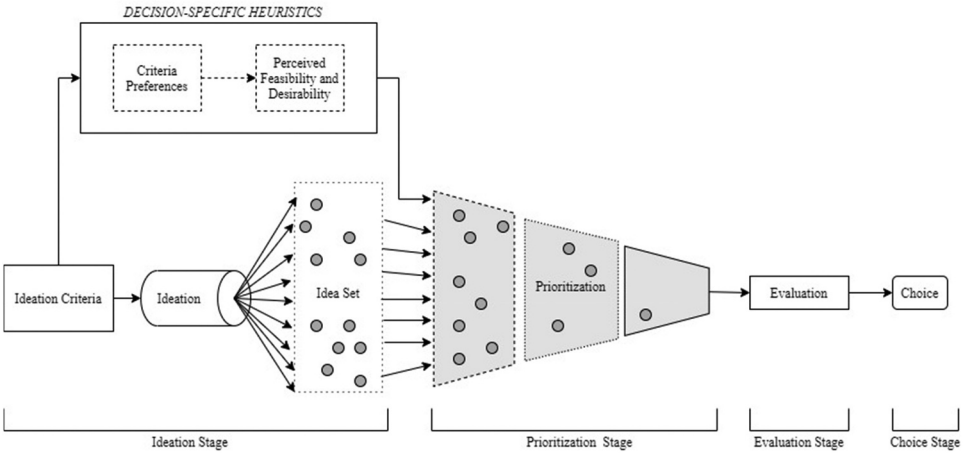

Figure 1. Overview of the process from ideation to opportunity evaluation.

Theoretical background

Through our theoretical model (Figure 1), we propose prioritization as a bridge between ideation and opportunity evaluation using decision-making theory. PEs generate multiple potential ideas (ideation stage) using a variety of criteria; each of those criteria are associated with unique preferences. They subsequently identify those associated preferences that inform their feasibility and desirability perceptions. Those same preferences are employed as decision-making heuristics to be used in the prioritization of the idea set (prioritization stage). Decision-making literature has identified prioritization by individuals to, either or both, shrink and rank-order the items in a consideration set (Hauser, 2014), with the goals of simplifying subsequent analysis and saving cognitive effort. Ultimately (evaluation stage), PEs will focus their attention first on the idea set's highest priority idea, evaluating it as a potential venture.

The following sections draw upon the decision-making literature on consideration sets and heuristics as the theoretical base for this study. We highlight how prioritization occurs within a consideration set of ideas using preference-based decision-specific heuristics, and the critical role of perceived feasibility and desirability. Subsequently, we generate a series of hypotheses regarding how specific preferences are likely to affect prioritization.

Consideration set decision-making – setting the foundation for the prioritization stage

We turn to the decision-making literature to inform our theoretical approach to idea set prioritization. Consideration sets, including idea sets – the collection of entrepreneurial ideas an individual has access to (Hill & Birkinshaw,

2010) – can present a significant cognitive challenge for decision-makers. Analytically evaluating a consideration set requires an individual to compare each item in the set against each decision variable and then compare and contrast each item's score (Andersen & Buvik, 2002; Payne et al., 1993). As the set becomes larger and the number of decision variables grows, the complexity of the decision magnifies exponentially (Hauser & Wernerfelt, 1990). For this reason, the items within a consideration set are prime candidates for prioritization through preference-based decision-specific heuristics (Hauser, 2014).[2]

Prioritizing one, or a subset, out of several ideas would be useful for PEs as it potentially leads to a more efficient and less effortful subsequent opportunity evaluation. Scheaf et al. (2020) use a theoretical four-factor model for opportunity evaluation – gain estimation, loss estimation, perceived feasibility, and perceived desirability – each requiring unique data, analysis, and evaluation. This multifaceted evaluation process can be taxing and effortful. Moreover, because each idea generated creates a subsequent analytical cost for a PE in the opportunity evaluation stage, the more productive an individual's ideation,[3] the higher the quality of those ideas (Kier & McMullen, 2018), and the more cognitive effort is needed to sort through them. Prioritization is helpful here, as it allows PEs to focus on sorting out the best ideas first and potentially avoid any effort, or at least use less effort, evaluating the other ideas (Hauser, 2014). Thus, PEs that generate a consideration set with multiple ideas are likely to benefit from prioritizing these ideas to conserve some of their effort in the opportunity evaluation process.

Hypotheses

Idea set prioritization through decision-specific heuristics

Herbert Simon defines heuristics as "methods for arriving at satisfactory solutions with modest amounts of computation" (Simon, 1990, p. 11). In other words, heuristics are simple processes to reduce effort and replace complex algorithms (Newell & Simon, 1972). Entrepreneurs are particularly prone to using heuristics (Busenitz & Barney, 1997) because heuristics are a fast and frugal way to satisfice decision-making needs (Shepherd et al., 2015). Heuristics are particularly useful when a decision is noticeably complex (Shah & Oppenheimer, 2008), as it often is in entrepreneurship (Baron, 1998;

[2]Consideration sets and heuristics research in business has largely been focused on consumer marketing (for example, DeSarbo & Jedidi, 1995; Mehta et al., 2003). One exception is the internationalization decision, in which Clark et al. (2018) show that international entrepreneurs use the country familiarity heuristic to narrow down and prioritize international expansion targets. Similarly, Williams and Grégoire (2015) also find evidence of entrepreneurs using heuristics to evaluate international ventures' attractiveness. However, outside of this niche, prioritization, especially of idea sets, has been investigated less.

[3]Research by Kier and McMullen (2018) showed that by using a single technology prompt, one productive ideator can produce 10 business ideas in 15 minutes.

Mitchell et al., 2002). Indeed, one study found that analytical evaluation of a single opportunity (not multiple, as in this study) is so complex that entrepreneurs employ heuristics as the first-pass evaluation before subsequent analysis (Bryant, 2007). Hauser (2014) explores the heuristics available for evaluating consideration sets and categorizes them into two groups: general use heuristics and decision-specific heuristics. General use heuristics are broad and usable in many situations to influence decision-making (Hauser, 2014). These general heuristics, such as the availability heuristic (Baron, 1998), the law of small numbers (Simon et al., 2000), and representativeness (Busenitz & Barney, 1997), also dominate the decision-making literature in entrepreneurship.

Decision-specific heuristics, in contrast, are rules created by a decision-maker that are specific to a given decision and are useful for prioritizing within a specific consideration set (Hauser, 2014). As such, we focus on decision-specific heuristics for idea set prioritization. Many decision-specific heuristics are formed around an individual's beliefs and preferences regarding the decision criteria (Burns, 2004; Moser, 2016). The classic example is the so-called "hot-hand" fallacy, where basketball coaches use their belief that one player is "hot" or on a streak and subsequently assign that player to take the next shot (Gilovich et al., 1985). These initial rapidly formed heuristics are inherently changeable and adaptable with circumstances, as new ideas are developed or new information is identified (Gigerenzer et al., 2011; Leimar, 2010). Consequently, we argue that PEs that ideate multiple ideas concurrently will face a cognitive challenge in choosing which idea to evaluate in-depth. PEs will seek to prioritize their idea set to address that challenge, using decision-specific heuristics to inform the prioritization. Their prioritization will consist of rapid rank ordering of their idea set, reflecting their preferences and the intended order for subsequent action (Brandstätter et al., 2006). Thus,

Baseline Hypothesis: Potential entrepreneurs prioritize within a consideration set of ideas.

Constructing decision-specific heuristics through feasibility and desirability

Decision-specific heuristics are likely constructed from information already on hand because information search and retrieval increase cognitive effort. Further, the information needs to be relevant to the decision-making process and easily accessible to allow for rapid decision-making. By focusing on these needs, information already used during ideation is both relevant and easily accessible to PEs going into the prioritization stage. In contrast, the opportunity evaluation literature (for example, McMullen & Shepherd, 2006) has focused on the individual's perception of whether a potential venture is

feasible and desirable. To this end, we examine a stage between ideation and opportunity evaluation – where PEs form perceptions of feasibility and desirability by reconsidering the same criteria used in the ideation process (as preferences) and employ those perceptions as decision-specific heuristics during prioritization.

Perceived feasibility refers to "the actor's belief regarding whether this opportunity could feasibly be enacted by the actor" (McMullen & Shepherd, 2006, p. 133), informed by an individual's understanding that they can "competently engage the tasks and activities necessary to turn the idea into a manifest product or service" (Scheaf et al., 2020, p. 6). It is not an objective assessment, nor is it fixed (Dimov, 2010). These characteristics make feasibility also useful as a heuristic for prioritization and not just relevant in opportunity evaluation.

Shane and Eckhardt (2003, 2010) present the notion of opportunity as being idiosyncratic where a particular opportunity is suitable for a given individual. We know that individuals ideate potential ideas based on their available human capital since they are influenced by their unique combinations of resources (Barney, 1991; Gruber et al., 2012; Sarasvathy, 2001). Certain capital, namely knowledge, and social ties, are particularly important for providing relevant information to identify new ventures (Eckhardt & Shane, 2010; Sarasvathy, 2001; Shane, 2000). It is highly likely that this capital, having been previously employed in ideation, will be cognitively available for reconsideration during prioritization at a low cost. This reasoning is consistent with previous findings that individuals employ knowledge to identify opportunities (Shane, 2000; Venkataraman, 1997) and subsequently evaluate them based on factors such as the alignment with their human capital (Haynie et al., 2009). Further, individuals have preferences and prefer certain resources to others (Zhang & Burg, 2019). These preferences provide rapid, low-cost ways for individuals to form impressions about the feasibility of creating a venture. Thus, these preferences inform decision-specific heuristics and judgments of the perceived feasibility of the venture that can be applied in the prioritization of idea sets.

Perceived desirability refers to "the actor's belief regarding whether successful exploitation of the opportunity would adequately fulfill some personal desire" (McMullen & Shepherd, 2006, p. 133). Risk, the probability that opportunity pursuit could result in perceived negative outcomes (for example, loss; Norton & Moore, 2006; Osborne, 1995), is often seen as a counterpart to reward. Many conceptions of perceived desirability (Douglas & Shepherd, 2002; Fitzsimmons & Douglas, 2011) have included risk alongside the intrinsic and extrinsic motivational factors in the assessment of perceived desirability, such that desirability is the sum of risk and reward perceptions. In other conceptions, though, risk is not a factor in perceived desirability but a trade-off (Scheaf et al., 2020). Irrespective of how risk and reward contribute to

desirability assessments, they are both potential mechanisms that influence idea generation and are subsequently employed to narrow down an individual's idea set (Sarasvathy, 2001) and, later, their portfolio of opportunities (Bakker & Shepherd, 2017). Evaluating ideas or opportunities against both their risk tolerance and their desired rewards allows individuals to identify the most desirable options for themselves (Sarasvathy, 2001). Next, we develop hypotheses on how these preferences are used as decision-specific heuristics during prioritization.

Perceived feasibility – knowledge-based preference trade-offs

Self-evaluating one's idiosyncratic knowledge ("what I know") is a key early step in ideation (Gruber et al., 2012; Sarasvathy, 2001). There are certainly reasons for individuals to develop preferences around knowledge gained either through education or work experience, as both are key sources of critical information for nascent venture development (Davidsson & Honig, 2003). Knowledge from either source can play a vital role in identifying and exploiting opportunities (Shane, 2000). Knowledge derived from education is more likely to be accurate (others have vetted it), have a wider scope, and be codified. In contrast, knowledge derived from work experience is more likely to be subject to interpretation, narrower in scope, tacit, and rely on individuals' learning process (Geldhof et al., 2014; Kayes, 2002; Kolb & Kolb, 2009). Furthermore, while work experience appears to increase entrepreneurial intentions (Fatoki, 2014), there is evidence that young people with primarily educational knowledge may be better motivated and psychologically positioned to engage in entrepreneurship (Geldhof et al., 2014). Education facilitates a broad perspective that allows PEs to see numerous opportunities, while work experience gives entrepreneurs a more focused, in-depth perspective on fewer opportunities. However, neither education nor work experience is necessary for entrepreneurship (Herrington & Kew, 2017). Further, and most importantly, education is frequently associated with choice: individuals are more likely to choose their field of study (Beffy et al., 2012) than their job (Johnson, 1978).

However, there are several reasons to suspect that PEs might see greater value in work experience. First, work experience is likely to provide perspective on a specific opportunity (Kolb & Kolb, 2009; Shane, 2000). Indeed, many individuals discover ideas for starting a new business at work, where their skills and beliefs are heavily influenced (Sørensen & Fassiotto, 2011). Therefore, PEs associate work experience with greater insight into work-related opportunities, making their venture ideas appear more attractive. Second, research has found that potential stakeholders perceive entrepreneurs' top management teamwork experience as a sign of new venture legitimacy (Cohen & Dean, 1988). New ventures require legitimacy to acquire partners

and resources (Lounsbury & Glynn, 2001). To the extent that PEs seek to signal legitimacy to the market, they will likely view work experience as more valuable than education to do so. Third, research has found that work experience helps individuals become better workers with better performance (Quińones et al., 1995). This boost in performance may come from professional work experience that "leads to the development of knowledge and skills, motivation, and attitudes and values . . . and even personality characteristics" (Tesluk & Jacobs, 1998, p. 334).

Moreover, informal on-the-job experience contributes to individuals' leadership skills (McCall, 2004), and this practical, real-world context may prepare PEs to start their business. It allows PEs to develop a range of valuable business and social skills (Lazear, 2004) – important because entrepreneurs frequently need to wear many hats when starting a business (for example, Åstebro & Thompson, 2011; Lazear, 2004, 2005). Given this, PEs are likely to believe that related work experience better prepares them for a productive and successful venture than education. This reasoning leads to:

Hypothesis 1: Potential entrepreneurs prioritize an idea when they have work experience aligned with the idea rather than education aligned with the idea.

Perceived feasibility – social ties-based preference trade-offs

As with knowledge, self-evaluating one's idiosyncratic social network ("who I know") is a key early step in ideation (Sarasvathy, 2001). Building on the arguments developed above regarding knowledge, we argue that individuals' relative preference for a particular type of social connection – for example, weak or strong ties (Granovetter, 1973) – is driven by how individuals identify and assess their own social networks and the unique collective characteristics of individual social ties.

Social network structures consist of a series of links between individuals. These links appear in strong or weak ties, and each person tends to have a unique concentration of each tie type (Granovetter, 1973). In general, strong-tie relationships both generally last longer and imply a deeper connection than weak-tie relationships. Strong-tie relationships are also based on implicit reciprocity, so they require more frequent contact, are more reliable, and involve more trust and emotional closeness (Granovetter, 1973; Jack, 2005). Yet, there are fewer strong ties than weak ties in most networks, thus logically fewer available strong ties to connect. In contrast, weak-tie relationships are generally of shorter duration, have a shallower connection, and require less contact than strong ties. While weak ties are more likely to provide access to information an individual does not have (Granovetter, 1973), they are less reliable and more ambiguous and uncertain. Over time they may

become dormant, only to be revived when needed (Aldrich et al., 1997). However, there are more weak ties in most networks, and thus an abundance of weak ties with which to connect.

Identifying and qualifying social connections are themselves daunting cognitive tasks. For example, the size of human social networks ranges widely, with estimates from 150 individuals (Dunbar, 1993) to approximately 5,000 (Killworth et al., 1990; Pool & Kochen, 1978).[4] Recalling and assessing the information and resource potential of 150 individuals is a cognitively demanding task, a task whose nature likely influences its outcome (Campbell, 1988). Whereas the sources and domains of knowledge are relatively constrained for knowledge (that is, one has only so many jobs or educational accreditations), an individual's number of social connections is much larger. As such, recalling and processing social ties are sources of cognitive strain and are thus likely to be influenced by cognitive processes designed to relieve strain (Barrett et al., 2007). The availability heuristic is one such cognitive process, whereby the importance of an item is linked to the ease of its recall (Tversky & Kahneman, 1974). For individuals tasked with recalling and making sense of their ties, strong ties are often the easiest to recall due to the more frequent contact, closeness, and higher trust. Because of the availability heuristic, strong ties likely appear to be the most salient and are likely to be preferred when individuals evaluate possible venture ideas.

Beyond availability, there are other reasons to believe that individuals favor ventures aligned with strong ties over weak ties. PEs frequently suffer from resource paucity and need to rely on their networks to provide resources to support their ventures (Birley, 1985). Certain resources (for example, money) are likely to be especially important to PEs, thus overpowering other concerns. Specifically, many individuals experience difficulty accessing outside capital and rely on bootstrapping techniques to secure funds to launch and grow their ventures (Ebben & Johnson, 2006; Winborg & Lanstrom, 2001), likely involving strong ties such as close friends and family.

Further, motivation presents a key challenge for PEs (Jack, 2005). While weak ties may help provide perspective and information regarding a specific opportunity, strong ties are best suited to encouraging an individual to pursue that opportunity (Lechner & Dowling, 2003). With the risk inherent in entrepreneurship, networks provide either social consent or condemnation (Stuart & Sorenson, 2007) that can reinforce or weaken an individual's resolve to pursue an idea (Jack, 2005); however, social reinforcement from strong ties is particularly salient (Zimmer, 1986). While weak ties are an undoubtedly

[4]Hill and Dunbar (2003) analyze individuals' Christmas-card sending behavior to assess their network size and control for salience, finding a mean network size of 124.9 individuals. This number is consistent with the findings from sociologists, who argue that based on neocortex development and humans' cognitive ability to manage and maintain relationships, individuals should live in and maintain social groups of approximately 150 individuals (Dunbar, 1993).

vital success factor for PEs and a source of key information and resources (Granovetter, 1973), we argue that PEs prefer ideas that align with strong ties instead of weak ties. This reasoning leads to:

Hypothesis 2: Potential entrepreneurs prioritize an idea when they have predominantly strong social ties aligned with the idea rather than predominantly weak ties aligned with the idea.

Perceived desirability – risk/reward-based preference trade-offs

Individuals have unique risk tolerances and reward motivations. While it is relatively difficult to assess the risk and reward of a given opportunity, there are two potential shortcuts, driven by rapid assessments of the potential downside of the opportunity that could facilitate perceived desirability assessments. First, an affordable loss is the total loss of all inputs (Dew et al., 2009; Dickson & Giglierano, 1986; Tversky & Kahneman, 1989). The decision-maker considers whether they can afford to lose their total investment. This approach could be particularly appealing for some PEs (Chandler et al., 2011; Dew et al., 2009). Cognitively, it is the more straightforward calculation where individuals need only calculate the necessary resource inputs. In addition, affordable loss is the worst-case scenario (Bryant, 2007; Dew et al., 2009), and for more conservative individuals, it will provide an absolute viewpoint on the risk of their idea.

Second, expected loss is the opposite of expected gain: it balances each potential outcome's probability against the loss associated with that outcome. There are some reasons to expect a preference for expected loss, which is a vital criterion in many areas of decision-making, including finance (Gabih et al., 2009), economics (Zellner & Park, 1979), and environmental studies (Cao et al., 1999). Expected loss reflects the asset-building that individuals engage in as they create their businesses, better than affordable loss. Various assets built through venturing retain their value even after failure, which affordable loss does not consider. In contrast, expected loss allows the proposed venture to retain "scrap value" even after it fails (McGrath & MacMillan, 1995). This scrap value could include, for example, resources that individuals can retain and potentially apply to a subsequent idea. Further, many of the rewards from venturing are not quantitative/financial (self-employment, autonomy, intrinsic satisfaction, and more; Binder & Coad, 2013; Fitzsimmons & Douglas, 2011; Scheaf et al., 2020). As expected loss stresses retained value, these nonquantitative benefits enhance the retained value of the venture, which may be appealing to some individuals.

Further, expected loss lowers the perceived risk of an idea, thus increasing its attractiveness and reducing entry barriers (Forlani & Mullins, 2000). For example, consider an individual with a loss limit of $50K. An idea requiring a $100K investment would not be an affordable loss for this individual. In contrast, if the expected loss is $50K or less (despite the $100K investment), the PE is more likely to find the idea attractive because it is within their loss limit. Assuming the PE has access to these funds, an expected loss perspective is more likely to result in higher idea prioritization than an affordable loss perspective.

Also, framing risk preferences around expected loss can improve the perceived outcomes of an idea. As expected loss estimates are typically smaller than those of affordable loss, expected loss can fundamentally change individuals' risk/reward preferences, to where low-risk/low-reward scenarios are made to look more appealing.[5] For example, for a $100K investment in a low-risk/low-reward scenario and an expected value of $120K, from an affordable loss perspective (total investment loss), the 20% return against risk may not be attractive. However, for an investment of $100K with an expected loss of only $50K, the return against risk is now 140%, even though the return on investment is unchanged at $120K. While the same logic holds for high-risk/high-reward scenarios, the scale is not the same. Consider the same $100K investment against an expected idea value of $1.2 million. From an affordable loss perspective, the return against risk is now 1,100%. In contrast, assume the expected loss on a high-risk idea is $95K. The return against risk is 1,136%, only a 36 percentage point improvement compared to the 120 percentage point improvement in the low-risk/low-reward scenario. Thus, while an expected loss logic makes all ideas appear more attractive, low-risk/low-return scenarios are much more attractive and are thus likely to particularly appeal to risk-sensitive PEs (Caliendo et al., 2009).

We turn to decision-making theory to understand how these preferences are likely to apply when comparing a low-risk/low-reward idea and a high-risk /high-reward idea. If PEs follow an affordable loss logic, once they invest, they have to assume their investment is lost; thus, the risk consideration (of risk/reward) of the two scenarios is equivalent. According to two different decision-making theories, prospect theory (Kahneman & Tversky, 2013) and game theory (Myerson, 2013), PEs, when the risk consideration is equivalent (total loss of the same investment), should then choose the option with the highest return (high-risk/high-reward). Analogically, when buying a lottery ticket, we are likely to buy one for a high-value/low-probability draw over a low-value /high-probability draw when ticket prices are the same. Hence, lottery ticket sales skyrocket when jackpots are high.

[5]There are four basic combinations of risk and reward: high-risk/low-reward (the "suckers" bet), low-risk/high-reward (the "no-brainer"), high-risk/high-reward (the "gamble"), and low-risk/low-reward (the "safe bet"). Given that the first two combinations result in clear and obvious choices, we focus on the remaining two scenarios as they are the most realistic and are likely to challenge an individual's risk/reward preferences.

In contrast, an expected loss logic, even though it is cognitively more costly, makes the low-risk/low-reward scenario more appealing because the expected loss is lower than for the high-risk/high-reward scenario. Thus, despite the increased cognitive cost of calculating the expected loss, there are numerous reasons for PEs to prefer and use expected loss framing over affordable loss framing. They are likely to choose such framing because, as described above, expected loss better reflects the true outcomes of venturing: it enables PEs to perceive higher salvage value, greater affordability of loss, and a higher upside for their ventures. As a result, we expect PEs to prefer low-risk/low-reward scenarios over high-risk/high-reward scenarios when the investment cost is equal. This preference will be employed as a decision-making heuristic to prioritize a consideration set of ideas. This reasoning leads to our final hypothesis:

Hypothesis 3: Potential entrepreneurs prioritize a low-risk/low-reward idea rather than a high-risk/high-reward idea.

Data and methods

We designed two studies to test our hypotheses because of the established advantage of constructive replication (Lykken, 1968) and the desirability to employ multiple methods (McGrath, 1981; Shepherd, 2015; Wertz, 1999). Study 1 tests our first hypothesis, whether prioritization occurs in the form of an idea generation task and rank-ordering possibility. Study 2 analyzes the initial components of the prioritization process in the form of prioritization preference trade-offs. We use an equivocal forced-choice conjoint experiment because of its capacity to isolate variables (for example, Spencer et al., 2005) and examine how trade-offs result in insightful decisions. Both studies use the same sampling frame and benefitted from the same pretests. We used the online survey tool Qualtrics to design both studies and to manage e-mail distribution. Each study started with an introduction and consent form, followed by explanations of the experiment. We present both studies sequentially and offer an appendix to detail the experiment tasks' measures and examples.

Sample frame and participants

Our sample frame for both studies comprises executives, managers, and non-experienced individuals drawn from the global student population of a European business school that, over the past five years, has consistently been highly ranked for entrepreneurship (the top five percent in Europe). Specifically, we drew from various entrepreneurship training programs at all levels of study, including postgraduate program participants with professional

experience (including executives) and undergraduates with little work experience. Our sample frame is diverse, including dozens of nationalities and varied experience levels and business backgrounds, resulting in a heterogeneous international sample. This sample contrasts with the otherwise predominantly US-based data-collection efforts in many studies on PEs (Mullen et al., 2009). We chose this sample frame because it has the greatest likelihood of including three main types of PEs: (1) individuals who ultimately start an independent business, (2) individuals who engage in intrapreneurship with their employers, and (3) individuals whose entrepreneurial ambitions are never realized. This sample allows for examining the factors affecting opportunity ideation and prioritization without committing participants to one particular form of entrepreneurship.

To ensure our sample's appropriateness, we followed the guidance of Williams et al. (2019) and others (for example, Grégoire et al., 2019; Hsu et al., 2017), on selecting samples and when student samples (including undergraduate students with limited work experience) are appropriate to study entrepreneurial processes. Accordingly, student samples are relevant when (1) students represent the population of interest, (2) professional experience can bias the manipulation, and (3) the relationship under investigation is grounded in broad theory. First, our focus is on investigating the early preference-based decision-specific heuristics PEs employ, and this population does include students. Second, all our hypotheses are grounded in decision-making theory. Finally, our student sample is appropriate because the dependent variable does not presume any need for having achieved a certain level of work or entrepreneurial experience (Grégoire et al., 2019), and because the executives, managers, and inexperienced students in our sample are all capable of considering and potentially pursuing ideas (Shepherd et al., 2019).

Pretests

Before we engaged in data collection, we first conducted three rounds of pretests with academics and practitioners. We also conducted 22 semi-structured interviews with PEs to pretest the variables and collected valuable input on our proposed experiments and measures. We tested the understandability and length of the instruments. In particular, our respondents confirmed that the rank-ordering possibility in Study 1 and the trade-offs in Study 2 made sense to them and that they thought about their decision to prioritize venture ideas in such ways. We improved our instruments with the participants' feedback, for example, including the wording "professional objectives," which respondents understood to encompass financial and nonfinancial objectives, thereby ensuring the understandability, relevance, and face validity of our tested variables.

Participants Study 1

To collect data for Study 1, we sent an electronic survey instrument to 359 PEs. With 122 individuals (all engaged in a postgraduate MBA program) supplying sufficient data to analyze their prioritization, we reached a response rate of 34%. A sample size of more than 100 is comfortable in our setting, especially given that all PEs first were given the chance to generate up to seven ideas, which provided us with 800+ ideas from which we can derive differences in positioning as indicators of prioritization.

Experimental Design Study 1

After presenting the introduction and experiment, we asked PEs to ideate seven ideas in random order, providing prompts such as "One of the easiest ways to kick-start the idea generation process is to think about what annoys you. Identify universal, annoying problems. Think of one you find particularly relevant or painful. Think of a solution for that problem. Please describe that idea below." We recorded all ideas in text fields (we asked for at least 10 characters and, on average, received 113, with the most detailed description reaching 1998 characters). This task resulted in seven ideas that we collected from the text fields and presented back to the same PEs in random order in one overview list (with randomized idea slots 1–7). We then allowed PEs, if desired, to prioritize their ideas by dragging and dropping the idea descriptions into the desired order from 1 (first priority) to 7 (last priority).

Variable Study 1

We measured prioritization distance – our focal variable in Study 1 – as the sum of the absolute values of the differences between the position slot in which an idea was presented (slot 1–7) and the slot it was prioritized into (priority 1–7). For instance, if the idea that was generated and then randomly presented in slot 3 was (de)prioritized into priority 5 or prioritized into priority 1, either of these changes would contribute a summand of 2 to the final sum of prioritization distance. The final sums ranged from zero (9 out of 122 PEs chose not to change the random order of ideas, 113 chose to do so) to 24 and averaged 12.1. Our measure of prioritization distance, the sum of absolute values, allowed us to record upward prioritization and downward prioritization as equal evidence of prioritizing. We are aware that the choice to change the position/priority of one idea necessitates at least one more change in another idea (because no two ideas can have the same priority ranking). Hence, our overall sum is by design made up of even summands.

Participants Study 2

To collect data for Study 2, we sent the second electronic survey instrument to 283 PEs. With 250 individuals (142 were engaged in a postgraduate MBA program, while 108 were completing their Bachelor in Business) supplying sufficient data to analyze all relevant parts of the survey, we reached a response rate of 88%. A sample size of more than 100 is comfortable and generally above what other conjoint studies have used (for example, Choi & Shepherd, 2004; Shepherd et al., 2000; Shepherd & Zacharakis, 2003; Wood & Williams, 2015). Further, our analyzable sample of 2,000 decisions (eight decisions per respondent) was sufficiently powerful for us to obtain substantial and significant effects.

Experimental Design Study 2

The experiment started with an introduction to the research and a consent form, followed by explanations of the experiment, variables, and an example conjoint profile of a decision. We used a post-experiment questionnaire to obtain the participants' individual characteristics to be employed as control variables. After studying the introduction and the conjoint profile explanation, the PEs considered eight conjoint profiles and provided an attractiveness rating for each presented idea to capture relative prioritization (Maine & Garnsey, 2006; Reuer et al., 2013).

We used an equivocal forced-choice (EFC) conjoint experiment to understand which relative preferences PEs use to prioritize ideas. A conjoint experiment is a set of realistic decisions with a fixed amount of decision variables on at least two levels, enabling participants' preferences to be decomposed via statistical analysis (Choi & Shepherd, 2004; Lohrke et al., 2010). Conjoint analyses have been successfully employed in several entrepreneurship studies (for a review, see Lohrke et al., 2010) and continue to be the preferred method to study decision-making in entrepreneurship (Shepherd & Zacharakis, 2018). An EFC is a variant of a traditional conjoint where respondents are presented with two objectively equivalent choices for the same variable and forced to trade-off based on their preferences. This technique is often present within a traditional conjoint experiment but with much less power and frequency. We showed participants eight profiles, each with three variables. There were two possible trade-offs for each variable ($2^3 = 8$ profiles). For more details on the EFC, how we deployed it, and how it compares with traditional conjoint method, please see Appendix 1.

Variables Study 2

Dependent variable. We measured prioritization as our dependent variable using the participants' ratings of perceived attractiveness for each idea they ideated, consistent with prior literature (Maine & Garnsey, 2006; Reuer et al.,

2013). Venture idea attractiveness was scored on a continuous scale from 0% to 100% (that for respondents appeared as an 11-point scale in the Qualtrics survey instrument), with end anchors of "Not attractive at all" and "Extremely attractive." The continuous scale allowed us to generate sufficient analyzable variance among the participants and to make fine discriminations between conjoint profiles. However, for robustness purposes, we had a secondary sample of 47 participants rate venture idea attractiveness on a 7-point Likert scale (1 = "Very unattractive" to 7 = "Very attractive") and found comparable response structures.

Independent variables. Our scenarios included three variable pairs, each presented as a trade-off, to dissect prioritization: (1) knowledge – work experience versus education, (2) social ties – strong versus weak, and (3) risk/reward – low-risk/low-reward versus high-risk/high-reward. Each pair is derived from the multiple ideation processes and preference-based decision-specific heuristics discussed above. Our pretests and interviews guided and eventually confirmed our design.

Knowledge. We employed a trade-off between two key independent types of knowledge for PEs: education and experience. We presented participants with one of two situations: "You have a relevant formal education but no experience relevant to this opportunity" (education > experience) or "You have relevant experience but no formal education relevant to this opportunity" (experience > education). This trade-off elicited the forced choice of whether the participants preferred formal education relevant to the potential idea or relevant practical experience. While it is possible that someone does not have "any" formal education or "any" practical experience that could be applied to an idea, we see these chances as low given our adult sample.

Social ties. The extant literature differentiates between strong and weak network ties (or close versus wide social networks). As with knowledge, there are distinct advantages, resources, and preferences associated with each type of social network tie. We presented the participants with one of two cases: "Relevant to this opportunity, you have few weak ties (acquaintances that can help from the extended social network) but many strong ties (close friends that can help from within the immediate social network)" (strong ties > weak ties) or "Relevant to this opportunity, you have many weak ties (acquaintances that can help from the extended social network) but few strong ties (close friends that can help from within the immediate social network)" (weak ties > strong ties).

Risk/reward. As Appendix 2 illustrates, following the existing literature on risk-reward scenarios (see Parker, 2018 for an overview), we presented one of two levels for this variable, either: (1) small probability of high reward ("There is a 20% chance to realize 80% of your professional objectives with this venture") or (2) high probability of small reward ("There is an 80% chance to realize 20%

of your professional objectives with this venture"). Both options have the same expected value of 16% and are hence equivalent. We used "professional objectives" instead of straight financial rewards because the literature on entrepreneurship consistently reports that financial gain is only one component of entrepreneurs' motivation (Binder & Coad, 2013; Kuratko et al., 1997).

Control variables. We controlled for entrepreneurial self-efficacy (ESE) because numerous studies have shown that ESE influences entrepreneurial intentions, entrepreneurial action, venture outcomes, and entrepreneurial risk taking (for a review, see Zhao et al., 2005). We used the McGee et al. (2009) 19-item ESE scale on a continuous 0–100% slider scale (which appeared as an 11-item scale for participants). The scale's high reliability, substantiated by a Cronbach's alpha of 0.86, confirms the scale's psychometric qualities for our setting and participants. We controlled for three types of additional experience and the participants' gender to discern individual-level influences. We measured work experience as each participant's years of work experience. We measured entrepreneurial experience as each participant's years of experience as an (former) entrepreneur and entrepreneurial projects as the number of projects each participant has worked on as an (former) entrepreneur. Gender was coded 1 for female participants and 0 for male participants.

Analysis and results

Table 1 shows the descriptive statistics of Study 1 for our prioritization distance measure and sample characteristics. The 122 participants had a mean prioritization distance of 12.1 – more than half (12) of the maximum possible prioritization/deprioritization score (24). This finding serves as the first indication that prioritization occurs. We further detail how many changes occurred in each position slot. The idea presented initially in slot 1 (though not necessarily ideated first) was changed in 66 of 122 cases, representing a prioritization activity for 54% of all ideas presented in slot 1. This measure is larger for all other presentation positions, culminating in the third idea presented (initially in slot 3) changing in 101 out of 122, or in 82% of cases. Position (slot) 7 had a mean of 3.39 changes in position (the largest mean), indicating that randomly presented ideas were most often changed into this position. Position (slot) 1 records the second-highest average (mean = 2.83), indicating that several ideas were consciously prioritized into the first position. Both of these results indicate clear de-prioritization and prioritization activity at the extremes of the rank-ordering list.

Table 1 further shows that our sample for Study 1 is composed of 31% female respondents. Participants were on average 28.6 years old, had over seven years of work experience and over two years of entrepreneurial

Table 1. Descriptive statistics study 1.

Variable	Obs	Mean	Std Dev.	Min	Max
Prioritization distance	122	12.10	6.10	0	24
Changes in position 1	66	2.83	1.70	1	6
Changes in position 2	78	1.87	1.23	1	5
Changes in position 3	101	2.55	1.14	1	4
Changes in position 4	93	1.96	0.82	1	3
Changes in position 5	96	1.91	1.03	1	4
Changes in position 6	94	2.50	1.44	1	5
Changes in position 7	84	3.39	1.58	1	6
female	118	0.31	0.47	0	1
workexp	118	7.27	2.10	4	14
entexp	118	2.24	1.96	1	10
entprojects	117	2.09	1.75	1	14
age	118	28.66	2.74	22	35

experience, working on average in two entrepreneurial projects. These data give us confidence that our respondents were indeed in a position to generate and prioritize ideas because they had done so before.

Table 2 shows the frequency of each possible prioritization distance. The distribution is normal. Nine individuals made no changes to prioritization order, while the remaining 113 individuals on average prioritized their ideas in a total of 13 "slot spaces." Only three individuals made the smallest possible change between two adjacent ideas (thereby generating a prioritization distance of two). In comparison, 25 individuals reprioritized their idea sets an accumulated distance of 12 (the median). To obtain this distance, participants would need to change the order of at least three ideas or precisely swap the first and seventh presented idea in their prioritized idea sets. Further, 53% of participants produced prioritization distances between 10 and 16, and more than 70% produced distances greater than 10. Given these data, we find evidence that the vast majority of participants voluntarily engaged in substantial prioritization activity.

Table 2. Distribution of prioritization distance in study 1.

Variable	Freq.	Percent	Cum.
Prioritization distance = 0	9	7.38	7.38
2	3	2.46	9.84
4	5	4.1	13.93
6	6	4.92	18.85
8	9	7.38	26.23
10	14	11.48	37.7
12	25	20.49	58.2
14	13	10.66	68.85
16	13	10.66	79.51
18	7	5.74	85.25
20	10	8.2	93.44
22	3	2.46	95.9
24	5	4.1	100
Total	122	100	

As for Study 2, Table 3 shows the descriptive statistics. We note a wide range of individuals' prioritization of multiple ideas (as captured through venture idea attractiveness). This diversity is reflected in a mean venture idea attractiveness score of 60.5 out of 100 and a standard deviation of 23.5 such that 68% of ratings were between 37 and 84 – a considerable range reflecting prioritization rankings. Likewise, our sample of PEs showed substantial entrepreneurial self-efficacy (McGee et al., 2009), as expressed in their average self-efficacy rating of 68.9 out of 100. On average, participants had 4.2 years of work experience, 0.8 years of venturing experience, and worked on 1.37 ventures in the past. Note that our sample included some individuals with no work or venturing experience. The sample was made up of 37% female PEs. Of the 250 PEs, 142 were engaged in an MBA program, while 108 were Bachelor in Business students. The above characteristics support our classification of these participants as PEs.

The experiment recorded eight evaluations and one replication per person. The replication was used for reliability testing only and was not included in the main analysis. The mean test-retest correlation on the replicated conjoint profiles across all PEs who completed the experiment with useful data is high (0.77 and $p < 0.01$). This test assures that each participant performed the conjoint task consistently (Choi & Shepherd, 2004; Shepherd & Zacharakis, 2018). Conversely, we report the intraclass correlation as a form of consistency of agreement in a two-way random-effects model of our sample and found individual values of 0.23 indicative of considerable heterogeneity in how different respondents prioritized the same conjoint profiles.

We used mixed-effect regression analysis and clustered the standard errors at the participant level to explore how much the inclusion of our hypothesized main effects improves the base model. We present the results in Table 4. Model fit statistics indicate that the inclusion of the main effects in Model 1 significantly improves the fit of our venture idea attractiveness models of prioritization compared to the controls-only model (Model 0). The increase of 21 percentage points in Snijders/Bosker R-squared on the decision-making level from Model 0 to Model 1 indicates clear model improvement after including the three explanatory variables. As shown in Table 4 for the main-effects model (Model 1), all three main effects display a highly significant ($p < 0.001$) relationship with the venture idea attractiveness score for prioritization. Together with the findings from Study 1, these data from Study 2 also support our Baseline Hypothesis that participants used their preferences to prioritize their idea sets.

As for Hypothesis 1, knowledge's negative main effect indicates that PEs assess lower priority when they possess education aligned with a venture idea instead of experience. In support of Hypothesis 1, PEs give higher priority to an idea when they have experience rather than education relevant to the idea. To further illustrate, the significant negative coefficient of knowledge (−10.69) suggests a decrease of over ten percentage points in assessed prioritization when an

Table 3. Descriptive statistics and correlation table study 2.

	Variable	N	Mean	Std Dev.	Min.	Max.	1	2	3	4	5	6	7	8	9
1	Venture Idea Attractiveness	2,000	60.53	23.47	0	100	1								
2	Knowledge Resources	2,000	0.5	0.5	0	1	−0.2279*	1							
3	Social Resources	2,000	0.5	0.5	0	1	0.3854*	0	1						
4	Risk/Reward Preferences	2000	0.5	0.50	0	1	−0.0856*	0	0	1					
5	Entrepreneurial Self-efficacy	250	68.89	11.57	26.8	99.4	0.1236*	0	0	0	1				
6	Work Experience	250	4.20	3.64	0	15	−0.0318	0	0	0	0.0442*	1			
7	Entrepreneurial Experience	250	0.82	1.46	0	10	0.0305	0	0	0	0.1407*	0.2231*	1		
8	Entrepreneurial Projects	250	1.37	3.19	0	30	−0.0184	0	0	0	0.1392*	0.1636*	0.5546*	1	
9	Gender	250	0.37	0.48	0	1	0.0406	0	0	0	−0.1417*	−0.0906*	−0.1251*	−0.024	1

*Indicates significant pairwise correlation at least at the 5% level.
All independent variables have zero order correlation by design.

Table 4. Mixed-effect regressions on venture idea attractiveness.

			Model 0	Model 1	Effect Size
		Variables	Controls	Main Effects	Cohen's f^2
Main Effects	H1	Knowledge Resources		−10.69***	0.11
				(0.88)	
	H2	Social Resources		18.03***	0.30
				(1.04)	
	H3	Risk/Reward Preferences		−4.02***	0.01
				(1.07)	
Controls		Entrepreneurial Self-efficacy	0.27***	0.27***	
			(0.07)	(0.07)	
		Work Experience	−0.23	−0.23	
			(0.22)	(0.22)	
		Entrepreneurial Experience	1.02	1.02	
			(0.63)	(0.63)	
		Entrepreneurial Projects	−0.48	−0.48	
			(0.36)	(0.36)	
		Gender	3.05*	3.05*	
			(1.54)	(1.54)	
		Constant	41.44***	39.75***	
			(4.74)	(4.74)	
		Number of Groups (Participants)	250	250	
		Number of Observations (Decisions)	2,000	2,000	
		Degrees of Freedom	5	8	
		Snijders/Bosker R-squared Level 1	0.02	0.23	
		Snijders/Bosker R-squared Level 2	0.08	0.08	
		Wald Chi-squared	29.93***	471.9***	
		Log Pseudo-likelihood	−37,321.4	−8742.0	

Mixed-effects regression coefficients are grouped by participant with robust standard errors adjusted for clusters in parentheses
Significance: ***at the .1% level, **at the 1% level, *at the 5% level.

individual has relevant education for an idea but no relevant experience, holding all other variables stable. Cohen's f^2 effect size, appropriate for mixed level models and calculated as per Selya et al.'s (2012) methodology for use with Stata software, was 0.106. This is a medium effect size (Cohen, 1988, 1992).

In support of Hypothesis 2, social ties' positive main effect indicates that PEs give higher priority to an idea when they possess many strong and few weak ties aligning with the idea rather than few strong and many weak ties. To illustrate, the significant positive coefficient of social ties (18.03) suggests that when an individual has many strong ties and few weak ties that align with an idea (compared to many weak ties and few strong ties), assessed prioritization increases by 18 percentage points, holding all other variables constant. The effect size is 0.302 as per Cohen's f^2 and as such counts as a medium to a large effect (Cohen, 1988, 1992). By comparison, the coefficient and the effect size both suggest that preferences for social ties relate to assessed prioritization more strongly than knowledge or risk/reward.

Regarding Hypothesis 3, the negative main effect of risk/reward indicates that PEs assess lower priority when they perceive that an idea is a high risk/high reward instead of a low risk/low reward. In other words, and supporting Hypothesis 3, assessed prioritization increases when a venture idea is described as a low risk/low reward instead of a high risk/high reward. In this

case, the switch toward a higher-risk/higher-reward scenario, paired with the highly significant negative coefficient of risk/reward (−4.02), suggests a decrease in assessed prioritization of four percentage points, holding all other variables stable. The corresponding effect size is 0.015, which is a low effect size (Cohen, 1988, 1992) in absolute terms and also in relative terms when compared to knowledge or social ties. This should not be a surprise, however, given the mathematically equivalent setup of this factor.

Robustness checks

We employed a series of robustness checks to establish the applicability of our findings to modified settings (Crano & Brewer, 2002). First, we retested our models with different subsamples. Our first subsample robustness check separated our sample into two groups: 142 participants with at least three years (and an average of 6.7 years) of work experience and 108 participants with less than three, or even zero, years of work experience. In both subsamples, the findings confirmed all the main effects. We also tested moderation effects, and as expected, the reduced variance in work experience in each subsample rendered the moderation effects nonsignificant. Splitting our sample to compare those 98 individuals without prior entrepreneurial experience to those 152 respondents with prior entrepreneurial experience provided the same results. These findings increase our confidence that our empirical design is not sensitive to PEs' experience, but rather allows us to equally generalize our findings to both groups.

Second, we tested our three main effects on a second independent sample of 38 executives (not reported) who did not fill out the control variable for entrepreneurial projects and thus lacked full comparability with the other two subsamples. However, these tests on the additional sample did confirm the main effect of experience over education and the relative preference for strong over weak ties. We could not estimate the relative preference for low-risk/low-reward scenarios among this group with sufficient precision because this group had the lowest relative preference for low-risk/low-reward ideas (that is, Hypothesis 3).

Third, we checked whether work experience had a quadratic relationship with venture idea attractiveness. We found no evidence of a quadratic relationship for the direct effects or the interaction. These findings support our choice to use participants' work experience in years as a simple linear count measure.

Fourth, because many of the rewards from venturing are not quantitative/financial, we tested different specifications of "professional objectives" for our risk/reward preferences and their respective relation to assessed prioritization. We found that including intangible professional objectives by suggesting "financial and non-financial rewards" or specifying "autonomy or recognition" explicitly, rendered the same results.

Discussion

Table 5 summarizes and briefly interprets our findings. With these findings, we make three key theoretical contributions to the entrepreneurship and venture development literature, as well as contributions to method and practice. First, we complement the emerging literature on multiple ideation (for example, Grégoire & Shepherd, 2012; Gruber et al., 2008, 2013; Kier & McMullen, 2018) and decision-making (for example, Bakker & Shepherd, 2017; Hill & Birkinshaw, 2010) by adding a prioritization stage that theoretically bridges the multiple ideation phenomenon into the existing entrepreneurial decision-making process. We find evidence that prioritization occurs and works through preference-based decision-specific heuristics (detailed below). PEs use these types of heuristics to narrow down a broad consideration set of ideas produced in the ideation stage to a cognitively manageable prioritized list, facilitating one-at-a-time, single-opportunity consideration in the opportunity evaluation stage. As such, we expand our understanding of opportunity development processes and provide insights into how PEs cope with the cognitive strain of moving from productive ideation toward an evaluable opportunity. Further, we address what Wood and McKelvie (2015, p. 257) identify as a challenge in the literature, "the fuzzy boundaries around opportunity evaluation." Our model helps clarify those boundaries.

Further, while individuals' use of heuristics has been repeatedly discussed in the entrepreneurship literature (Shepherd et al., 2015), most studies have focused on general heuristics. Decision-specific heuristics are evidence of decision-specific cognition; that individuals cognitively engage in the decision both at the intuitive and the analytical levels. Prioritization using decision-specific heuristics has several key benefits for decision-makers: it reduces the cognitive effort of later evaluation (Clark et al., 2018); it allows individuals to ideate more and potentially better ideas (Kier & McMullen, 2018) without drastically increasing evaluation costs; and the heuristics carry face validity (Hauser, 2014) as a preference related to a resource critical to the idea (that is, decision-specific). More specifically, in this research, we show that the decision-specific heuristics used in the prioritization stage are preference-based. Consistent with prior research (Lerner et al., 2018; Shane, 2000), prioritization based on subjective interest or preferences rather than pure rationality is powerful in explaining how two individuals with the same idea could prioritize differently and consequently pursue different opportunities.

Second, in their foundational work, Hill and Birkinshaw (2010) identify the idea set as a distinct unit of analysis and suggest potential future research avenues into idea sets. Two of those avenues are: identifying individual psychological and social network influences and their effect on idea selection. We address these challenges in our research. For individual psychological influences, we find that individuals use preferences to form perceptions of feasibility and desirability as

Table 5. Summary of findings.

	Content	Proposed Dominant Preference	Proposed Subordinate Preference	Support?	Interpretation of Findings and Conclusions
HB	PEs prioritize a consideration set of ideas using decision-specific heuristics.	PEs have cognitive limits. Working with multiple ideas increases cognitive load (Shepherd et al., 2015; Bryant, 2007; Hauser, 2014; Brandstätter et al., 2006).	Opportunities are discrete events that are evaluated systematically (Scheaf et al., 2020). They are dichotomous (for me/ not for me; McMullen & Shepherd, 2006; Haynie et al., 2009), as opposed to linear (varying degrees of priority).	**Study 1** & **Study 2**: Supported	We harmonize the two proposed perspectives and build a bridge between the individual's ability to conceptualize multiple ideas and opportunity evaluation as a discrete event. Prioritization reduces the effort required to evaluate.
H1	PEs prioritize an idea when they have work experience aligned with the idea rather than education aligned with the idea.	Work experience is valued for: increasing entrepreneurial intention (Fatoki, 2014); facilitating opportunity discovery (Sørensen & Fassiotto, 2011); and leading to better performance (Quińones et al., 1995).	Education is more directly linked to what the PE likes (Beffy et al., 2012). Education generates accurate codified knowledge, where work experience generates narrow, tacit knowledge (Geldhof et al., 2014; Kayes, 2002; Kolb & Kolb, 2009).	**Study 2**: Supported	While both work experience and education are valued, when forced to decide, PEs place greater emphasis on work experience over knowledge gained through formal education.
H2	PEs prioritize an idea when they have predominantly strong social ties aligned with the idea rather than predominantly weak ties aligned with the idea.	Strong ties are valued for: providing resources (Birley, 1985); encouragement (Lechner & Dowling, 2003); and saliency of reinforcement (Zimmer, 1986).	Weak ties offer unique value (Granovetter, 1973) by providing a critical source of technical knowledge (Constant et al., 1996); and being helpful for opportunity identification (Kontinen & Ojala, 2011; Arenius & Clercq, 2005).	**Study 2**: Supported	While both strong and weak ties are valued, when forced to decide, PEs place greater emphasis on strong ties over weak ties.
H3	PEs prioritize a low-risk/ low-reward idea over a high-risk /high-reward idea.	Low risk/low reward reflects expected loss thinking, where the venture retains scrap value even if it fails (McGrath & MacMillan, 1995). Such ideas seem less risky (Forlani & Mullins, 2000) and individuals place value on intrinsic rewards (Fitzsimmons & Douglas, 2011).	High risk/high reward reflects affordable loss thinking, where the venture loses its investment once made (Dickson & Giglierano, 1986; Dew et al., 2009; Tversky & Kahneman, 1989), and which requires lower cognitive effort and recognizes loss aversion (Chandler et al., 2011; Dew et al., 2009; Sarasvathy, 2001).	**Study 2**: Supported	PEs can employ either profile depending on their idiosyncratic priorities, however, in general, greater emphasis is placed on low risk/reward profiles (expected loss) over high risk/high reward profiles (affordable loss).

decision-specific heuristics to prioritize their idea sets. Because we argue that the intuitive heuristics-based process of prioritization is fundamentally different from the analytical-based processes of evaluation (for example, Bryant, 2007), we do not claim that perceived feasibility and desirability in the prioritization stage informs the feasibility and desirability assessments used in opportunity evaluation (Scheaf et al., 2020), and any linkage between prioritization and opportunity evaluation are potential subjects for future research. Further, toward the Hill and Birkinshaw (2010) call, we find that PEs use their preferences for certain knowledge, social ties, and risk/reward profiles to form their feasibility and desirability perceptions. While scholars have theorized that individual preferences (or desires) are at play after ideation (for example, Arend et al., 2015; Zhang & Burg, 2019), we are among the first to empirically demonstrate that relative preferences within these conditions exist. In doing so, we continue from Sarasvathy's (2001) idea that individuals reflect on their resources as a source of ideas and suggest that this reflection cognitively promotes preferences that the PEs then employ in the prioritization stage before evaluation; both confirming and extending the importance of reflection, preferences, and prioritization in idea set processes. Thus, we contribute back to the ideation literature by improving clarity on the subjective nature of entrepreneurial decision processes (for example, Clark et al., 2022; Reuber et al., 2016). Further, strong ties (for example, Elfring & Hulsink, 2007) and work experience (Fern et al., 2012) have long been associated with venture formation, but the preferences we find for certain criteria over others is unique and influential. One idea we do not pursue in this paper is the potential negative effects of low preference for certain necessary inputs; for example, the hated but critically positioned brother-in-law that might prevent a PE from pursuing a potential idea. We advise future research to consider additional loci for preferences and additional relative preferences in decision-making models.

Third, our paper adds new perspectives to individual loss consideration. The entrepreneurship literature has strongly asserted the importance of total loss (also called affordable loss, Sarasvathy, 2001) as a critical component of entrepreneurial decision-making (for example, Forlani & Mullins, 2000; Mullins & Forlani, 2005; Wood & Williams, 2015). However, traditional economics deals with loss in a more calculative way through expected loss: the potential loss scenarios and the risk that each event could occur. Behavioral economics, however, complicates the issue by demonstrating that we perceive loss through reference to others or past states (Kahneman & Tversky, 1979). We find that PEs find expected loss logics useful in the prioritization stage. This finding suggests that individuals may employ one or more perspectives on loss depending on the situation or their preferences. These differing perspectives on loss are likely responsible for the seemingly conflicting notions that entrepreneurs are individuals who accept risks (Palich & Bagby, 1995), are inherently optimistic (Hmieleski & Baron, 2009), and yet also plan for the total loss of all inputs. Further, optimism may be

a psychological necessity, potentially explaining expected loss logics. If individuals are using their preferred ideation criteria to prioritize the most attractive ventures, they are putting resources at risk; as such, a more optimistic frame that allows for resources to be preserved and reused may be necessary to accept any risk. Research into decision-making will benefit from understanding and accounting for how the individual takes into consideration the loss in a given situation, and we suggest considering the role of affordable loss in the final venturing decision: in light of the best possible opportunity, what happens if it fails, and what if that failure is a total one?

Further, we also make a valuable methodological contribution to the literature on entrepreneurial decision-making. Our novel approach to traditional conjoint methodology in the form of the EFC conjoint method contributes an economical, effective, and accurate way to decompose preferences via purposefully limiting conjoint profiles to those developed around meaningful trade-offs. We propose that our design approach provides advantages in the form of efficiency, power, and accuracy. Efficiency is improved by reducing the number of (semi-) obvious conjoint profiles a respondent needs to evaluate. Power is enhanced by enabling more concentrated responses and reducing erroneously introduced variance, leading to higher consistency and decreased standard errors. Power is not a problem even with smaller sample sizes. Finally, accuracy is improved as the reduction in exercise-induced fatigue and expertise-based heuristics increases the chance that each trade-off receives full consideration and accurately reflects participants' relative preferences. We recommend this focused method for research questions exploring how decision variables are valued against each other. The higher realism introduced by asking participants to choose between difficult and revealing options, paired with the three advantages listed above, provides researchers with an additional tool for applying a conjoint methodology to best address their empirical needs.

There are important practical implications from this research. As PEs employ their preferences to guide prioritization, there is no guarantee that those preferences will reflect whether the idea is a good or bad one. The ultimate opportunity evaluation process (for example, Scheaf et al., 2020) will distinguish between good and bad ideas, but only after they have been prioritized. If individuals stop evaluating when they reach their first "good" idea, then it is possible that one or many great ideas would not be considered. Thus, our recommendation is a series of last "gut checks," where individuals go back to the consideration set and revisit the ideas with lower prioritization. Is there a good idea worthy of additional consideration? Further, trying to be creative actually works, resulting in more and better ideas (Kier & McMullen, 2018). However, availability theory (Schwarz et al., 1991) suggests that we are most likely to think about and consider the inputs we like, and as we show, those ideas are subsequently most likely to be prioritized highly, creating the risk that opportunity identification is highly prejudiced toward our favorite, and not necessarily our best, ideation criterion.

PEs would be well served to socialize their idea sets to trusted advisors to examine their prioritizations. It is advisable to separate ideation, prioritization, and opportunity evaluation into three separate work exercises, limiting potential heuristic biases from skewing the output and forcing PEs to take the time to recognize, itemize, and evaluate all inputs, not just the preferred ones.

Limitations

As with any experimental research, this project has its limitations. In particular, conjoint analysis asks participants to accept certain assumptions regardless of their generalizability. The assumptions in this research represent stylized cases that are not necessarily regularly observed in reality. For example, it is rare (but not impossible) for an individual to consider two ideas with identical expected values (Forlani & Mullins, 2000). Frequently, education and experience also have a closer relationship than our artificial divide suggested. However, the inverse is also true: asking entrepreneurs to choose between more or less education and work experience would tell us little. Our approach allowed us to identify PEs' relative preferences, and we recommend future research focus on how such trade-offs are made. Several interesting questions arise from our approach: in prioritization, how much education compensates for work experience, how many weak ties compensate for strong ties, what is the utility of a high-risk/high-reward venture, and when does the safer choice pale in comparison to the riskier choice?

We further recognize the limits of our PE sample. For example, while we attempted to control for as many individual decision-making characteristics as possible (for example, general work experience, education, and so on), some individuals may tend to over- or undervalue a prioritization tool (for example, related work experience) based on their current situation; for example, do they currently have a high risk/high reward venture they like, or a venture related to their work experience? (Schneider, 1976). PEs may also have different risk/reward preferences than current entrepreneurs, with possibly more to lose (Tversky & Kahneman, 1992). As such, our sample demonstrates that cognition is vital at the beginning of a possible entrepreneurial career. However, this cognition likely changes with more entrepreneurial experience in the same way as cognition shifts due to work experience. Thus, it would be theoretically interesting to replicate this research using a sample of experienced serial or portfolio entrepreneurs. We assume these experienced entrepreneurs' preferences may differ, but it is unclear how. Further, it is difficult to disaggregate work experience effects and age effects. They are frequently overlapping: a 40-year-old (compared to a 20-year-old) individual likely has more work experience, more venture-related weak ties, and more physical and financial resources. Are these due to age or work experience? There are naturally large significant correlations between the two that should be explored.

Moreover, the use of student samples remains a controversial topic. Given that PEs can be 15 or 50 years old, experienced or inexperienced, well connected or unconnected, it made sense for us to embrace the heterogeneity in our study, which our diverse sample of students at multiple levels of different programs offers. Especially given our focus on human capital and recent studies showing little difference in capital effects on entrepreneurial outcomes at different ages (Matricano, 2018), there are still significant differences due to level of education (Matricano, 2020). Our sample is appropriate to test our model and is consistent with other studies on this research topic (Grégoire et al., 2019; Hsu et al., 2017; Shepherd et al., 2019). For example, these students were taking an entrepreneurship program that might have influenced their attitudes toward the value of education for entrepreneurship. As this research aims to determine whether prioritization occurs and whether preferences affect prioritization, the student sample likely did not affect our findings. Still, it may have influenced the directionality of specific preferences and may affect our generalizability, given that these preferences may be guided by their entrepreneurship education.

Conclusions

Our research considers that ideas, through idiosyncratic ideation and prioritization, lie in the eye of the beholder. It introduces PEs' use of preference-based decision-specific heuristics on preferences such as knowledge, social ties, and risk/reward to manage the cognitive load of considering multiple possible ideas. Entrepreneurs have relative preferences regarding their resources and employ those preferences to prioritize potential ideas. By examining how ideation criteria lead to preference-based decision-specific heuristics, we see the potential to build bridges between the unique process of prioritization and other entrepreneurship themes. As research into the generation of multiple ideas continues to grow (for example, Kier & McMullen, 2018), the necessity of understanding the cognition entrepreneurs employ to turn larger consideration sets of ideas into ventures will only grow. The prioritization stage and preference-based decision-specific heuristics identified here are only the first steps to building a deeper understanding of this complex topic. We hope this study prompts future research in this area.

Acknowledgments

The authors would like to thank Dean Shepherd and Dave Williams for their invaluable assistance and input toward prior drafts. We would also like to thank Robert Pidduck and Daniel Lerner for their friendly reviews. Finally, we would like to thank the editors and reviewers at the *Journal of Small Business Management*.

Disclosure statement

No potential conflict of interest was reported by the authors.

ORCID

Daniel R. Clark http://orcid.org/0000-0003-1645-4667
Matthias A. Tietz http://orcid.org/0000-0001-9477-8152
Maya Kumar http://orcid.org/0000-0003-3545-3598

References

Aldrich, H. E., Elam, A. B., & Reese, P. R. (1997). Strong ties, weak ties, and strangers. In S. Birley & I. C. MacMillan (Eds.), *Entrepreneurship in a global context* (pp. 15–39). Routledge.

Andersen, O., & Buvik, A. (2002). Firms' internationalization and alternative approaches to the international customer/market selection. *International Business Review*, *11*(3), 347–363. https://doi.org/10.1016/S0969-5931(01)00064-6

Arend, R. J., Sarooghi, H., & Burkemper, A. (2015). Effectuation as ineffectual? Applying the 3E theory-assessment framework to a proposed new theory of entrepreneurship. *Academy of Management Review*, *40*(4), 630–651. https://doi.org/10.5465/amr.2014.0455

Arenius, P., & Clercq, D. D. (2005). A network-based approach on opportunity recognition. *Small Business Economics*, *24*(3), 249–265. https://doi.org/10.1007/s11187-005-1988-6

Åstebro, T., & Thompson, P. (2011). Entrepreneurs, Jacks of all trades or Hobos? *Research Policy*, *40*(5), 637–649. https://doi.org/10.1016/j.respol.2011.01.010

Bakker, R. M., & Shepherd, D. A. (2017). Pull the plug or take the plunge: Multiple opportunities and the speed of venturing decisions in the Australian mining industry. *Academy of Management Journal*, *60*(1), 130–155. https://doi.org/10.5465/amj.2013.1165

Barney, J. (1991). Firm resources and sustained competitive advantage. *Journal of Management*, *17*(1), 99–120. https://doi.org/10.1177/014920639101700108

Baron, R. A. (1998). Cognitive mechanisms in entrepreneurship: Why and when entrepreneurs think differently than other people. *Journal of Business Venturing*, *13*(4), 275–294. https://doi.org/10.1016/S0883-9026(97)00031-1

Baron, R. A., & Ensley, M. D. (2006). Opportunity recognition as the detection of meaningful patterns: Evidence from comparisons of novice and experienced entrepreneurs. *Management Science*, *52*(9), 1331–1344. https://doi.org/10.1287/mnsc.1060.0538

Barrett, L., Henzi, P., & Rendall, D. (2007). Social brains, simple minds: Does social complexity really require cognitive complexity? *Philosophical Transactions of the Royal Society B: Biological Sciences*, *362*(1480), 561–575. https://doi.org/10.1098/rstb.2006.1995

Beffy, M., Fougere, D., & Maurel, A. (2012). Choosing the field of study in postsecondary education: Do expected earnings matter? *Review of Economics and Statistics*, *94*(1), 334–347. https://doi.org/10.1162/REST_a_00212

Binder, M., & Coad, A. (2013). Life satisfaction and self-employment: A matching approach. *Small Business Economics*, *40*(4), 1009–1033. https://doi.org/10.1007/s11187-011-9413-9

Birley, S. (1985). The role of networks in the entrepreneurial process. *Journal of Business Venturing*, *1*(1), 107–117. https://doi.org/10.1016/0883-9026(85)90010-2

Bonsall, P., & Lythgoe, B. (2009). Factors affecting the amount of effort expended in responding to questions in behavioural choice experiments. *Journal of Choice Modeling*, *2*(2), 216–236. https://doi.org/10.1016/S1755-5345(13)70011-3

Bouchereau, V., & Rowlands, H. (2000). Methods and techniques to help quality function deployment (QFD). *Benchmarking: An International Journal*, *7*(1), 8–20. https://doi.org/10.1108/14635770010314891

Brandstätter, E., Gigerenzer, G., & Hertwig, R. (2006). The priority heuristic: Making choices without trade-offs. *Psychological Review*, *113*(2), 409–432. https://doi.org/10.1037/0033-295X.113.2.409

Brans, J. P., & Vincke, P. (1985). Note—A preference ranking organisation method: (The PROMETHEE method for multiple criteria decision-making). *Management Science*, *31*(6), 647–656. https://doi.org/10.1287/mnsc.31.6.647

Bryant, P. (2007). Self-regulation and decision heuristics in entrepreneurial opportunity evaluation and exploitation. *Management Decision*, *45*(4), 732–748. https://doi.org/10.1108/00251740710746006

Burns, B. D. (2004). Heuristics as beliefs and as behaviors: The adaptiveness of the "hot hand." *Cognitive Psychology*, *48*(3), 295–331. https://doi.org/10.1016/j.cogpsych.2003.07.003

Busenitz, L. W., & Barney, J. B. (1997). Differences between entrepreneurs and managers in large organizations: Biases and heuristics in strategic decision-making. *Journal of Business Venturing*, *12*(1), 9–30. https://doi.org/10.1016/S0883-9026(96)00003-1

Caliendo, M., Fossen, F. M., & Kritikos, A. S. (2009). Risk attitudes of nascent entrepreneurs–new evidence from an experimentally validated survey. *Small Business Economics*, *32*(2), 153–167. https://doi.org/10.1007/s11187-007-9078-6

Campbell, D. J. (1988). Task complexity: A review and analysis. *Academy of Management Review*, *13*(1), 40–52. https://doi.org/10.2307/258353

Cao, T., Petersen, M. D., Cramer, C. H., Toppozada, T. R., Reichle, M. S., & Davis, J. F. (1999). The calculation of expected loss using probabilistic seismic hazard. *Bulletin of the Seismological Society of America*, *89*(4), 867–876. https://doi.org/10.1785/BSSA0890040867

Chandler, G. N., DeTienne, D. R., McKelvie, A., & Mumford, T. V. (2011). Causation and effectuation processes: A validation study. *Journal of Business Venturing*, *26*(3), 375–390. https://doi.org/10.1016/j.jbusvent.2009.10.006

Choi, Y. R., & Shepherd, D. A. (2004). Entrepreneurs' decisions to exploit opportunities. *Journal of Management*, *30*(3), 377–395. https://doi.org/10.1016/j.jm.2003.04.002

Clark, D. R., Li, D., & Shepherd, D. A. (2018). Country familiarity in the initial stage of foreign market selection. *Journal of International Business Studies*, *49*(4), 442–472. https://doi.org/10.1057/s41267-017-0099-3

Clark, D. R., Pidduck, R. J., & Tietz, M. A. (2022). The malleability of international entrepreneurial cognitions: A natural quasi-experimental study on voluntary and involuntary shocks. *International Journal of Entrepreneurial Behavior & Research*, *28*(3), 741–766. https://doi.org/10.1108/IJEBR-08-2021-0639

Cohen, J. (1988). *Statistical Power Analysis for the Behavioral Sciences*. New York: Routledge.

Cohen, J. (1992). A power primer. *Psychological Bulletin*, *112*(1), 155–159. https://doi.org/10.1037/0033-2909.112.1.155

Cohen, B. D., & Dean, T. J. (2005). Information asymmetry and investor valuation of IPOs: Top management team legitimacy as a capital market signal. *Strategic Management Journal*, *26*(7), 683–690. https://doi.org/10.1002/smj.463

Constant, D., Sproull, L., & Kiesler, S. (1996). The kindness of strangers: The usefulness of electronic weak ties for technical advice. *Organization Science*, *7*(2), 119–135. https://doi.org/10.1287/orsc.7.2.119

Crano, W. D., & Brewer, M. B. (2002). Content analysis. In W. D. Crano & M. B. Brewer (Eds.), *Principles and methods of social research* (pp. 245–263). Lawrence Erlbaum Associates.

Davidsson, P., & Honig, B. (2003). The role of social and human capital among nascent entrepreneurs. *Journal of Business Venturing*, *18*(3), 301–331. https://doi.org/10.1016/S0883-9026(02)00097-6

DeSarbo, W. S., & Jedidi, K. (1995). The spatial representation of heterogeneous consideration sets. *Marketing Science*, *14*(3), 326–342. https://doi.org/10.1287/mksc.14.3.326

Desmet, K., & Parente, S. L. (2010). Bigger is better: Market size, demand elasticity, and innovation. *International Economic Review*, *51*(2), 319–333. https://doi.org/10.1111/j.1468-2354.2010.00581.x

Dew, N., Sarasvathy, S., Read, S., & Wiltbank, R. (2009). Affordable loss: Behavioral economic aspects of the plunge decision. *Strategic Entrepreneurship Journal*, *3*(2), 105–126. https://doi.org/10.1002/sej.66

Dickson, P. R., & Giglierano, J. J. (1986). Missing the boat and sinking the boat: A conceptual model of entrepreneurial risk. *Journal of Marketing*, *50*(3), 58–70. https://doi.org/10.1177/002224298605000305

Dimov, D. (2010). Nascent entrepreneurs and venture emergence: Opportunity confidence, human capital, and early planning. *Journal of Management Studies*, *47*(6), 1123–1153. https://doi.org/10.1111/j.1467-6486.2009.00874.x

Douglas, E. J., & Shepherd, D. A. (2002). Self-employment as a career choice: Attitudes, entrepreneurial intentions, and utility maximization. *Entrepreneurship Theory and Practice*, *26*(3), 81–90. https://doi.org/10.1177/104225870202600305

Dunbar, R. I. (1993). Coevolution of neocortical size, group size and language in humans. *Behavioral and Brain Sciences*, *16*(4), 681–694. https://doi.org/10.1017/S0140525X00032325

Ebben, J., & Johnson, A. (2006). Bootstrapping in small firms: An empirical analysis of change over time. *Journal of Business Venturing*, *21*(6), 851–865. https://doi.org/10.1016/j.jbusvent.2005.06.007

Eckhardt, J. T., & Shane, S. (2010). An update to the individual-opportunity nexus. In Z. A. Acs & D. B. Audretsch (Eds.), *Handbook of Entrepreneurship Research* (pp. 47–76). Springer.

Elfring, T., & Hulsink, W. (2007). Networking by entrepreneurs: Patterns of tie—formation in emerging organizations. *Organization Studies*, *28*(12), 1849–1872. https://doi.org/10.1177/0170840607078719

Fatoki, O. (2014). The entrepreneurial intention of undergraduate students in South Africa: The influences of entrepreneurship education and previous work experience. *Mediterranean Journal of Social Sciences*, *5*(7), 294–299. https://doi.org/10.5901/mjss.2014.v5n7p294

Fern, M. J., Cardinal, L. B., & O'Neill, H. M. (2012). The genesis of strategy in new ventures: Escaping the constraints of founder and team knowledge. *Strategic Management Journal*, *33*(4), 427–447. https://doi.org/10.1002/smj.1944

Fitzsimmons, J. R., & Douglas, E. J. (2011). Interaction between feasibility and desirability in the formation of entrepreneurial intentions. *Journal of Business Venturing*, *26*(4), 431–440. https://doi.org/10.1016/j.jbusvent.2010.01.001

Forlani, D., & Mullins, J. W. (2000). Perceived risks and choices in entrepreneurs' new venture decisions. *Journal of Business Venturing*, *15*(4), 305–322. https://doi.org/10.1016/S0883-9026(98)00017-2

Gabih, A., Sass, J., & Wunderlich, R. (2009). Utility maximization under bounded expected loss. *Stochastic Models*, *25*(3), 375–407. https://doi.org/10.1080/15326340903088495

Geldhof, G. J., Porter, T., Weiner, M. B., Malin, H., Bronk, K. C., Agans, J. P., Mueller, M., Damon, W., & Lerner, R. M. (2014). Fostering youth entrepreneurship: Preliminary findings from the young entrepreneurs study. *Journal of Research on Adolescence*, *24*(3), 431–446. https://doi.org/10.1111/jora.12086

Gigerenzer, G. E., Hertwig, R. E., & Pachur, T. E. (2011). *Heuristics: The foundations of adaptive behavior*. Oxford University Press.

Gilovich, T., Vallone, R., & Tversky, A. (1985). The hot hand in basketball: On the misperception of random sequences. *Cognitive Psychology*, *17*(3), 295–314. https://doi.org/10.1016/0010-0285(85)90010-6

Gordon, L. V. (1951). Validities of the forced-choice and questionnaire methods of personality measurement. *Journal of Applied Psychology*, *35*(6), 407–412. https://doi.org/10.1037/h0058853

Granovetter, M. S. (1973). The strength of weak ties. *American Journal of Sociology*, *78*(6), 1360–1380. https://doi.org/10.1086/225469

Grégoire, D. A., & Shepherd, D. A. (2012). Technology-market combinations and the identification of entrepreneurial opportunities: An investigation of the opportunity-individual nexus. *Academy of Management Journal*, *55*(4), 753–785. https://doi.org/10.5465/amj.2011.0126

Grégoire, D. A., Binder, J. K., & Rauch, A. (2019). Navigating the validity tradeoffs of entrepreneurship research experiments: A systematic review and best-practice suggestions. *Journal of Business Venturing*, *34*(2), 284–310. https://doi.org/10.1016/j.jbusvent.2018.10.002

Gruber, M., MacMillan, I. C., & Thompson, J. D. (2008). Look before you leap: Market opportunity identification in emerging technology firms. *Management Science*, *54*(9), 1652–1665. https://doi.org/10.1287/mnsc.1080.0877

Gruber, M., MacMillan, I. C., & Thompson, J. D. (2012). From minds to markets: How human capital endowments shape market opportunity identification of technology start-ups. *Journal of Management*, *38*(5), 1421–1449. https://doi.org/10.1177/0149206310386228

Gruber, M., MacMillan, I. C., & Thompson, J. D. (2013). Escaping the prior knowledge corridor: What shapes the number and variety of market opportunities identified before market entry of technology start-ups? *Organization Science*, *24*(1), 280–300. https://doi.org/10.1287/orsc.1110.0721

Hauser, J. R., & Wernerfelt, B. (1990). An evaluation cost model of consideration sets. *Journal of Consumer Research*, *16*(4), 393–408. https://doi.org/10.1086/209225

Hauser, J. R. (2014). Consideration-set heuristics. *Journal of Business Research*, *67*(8), 1688–1699. https://doi.org/10.1016/j.jbusres.2014.02.015

Haynie, J. M., Shepherd, D. A., & McMullen, J. S. (2009). An opportunity for me? The role of resources in opportunity evaluation decisions. *Journal of Management Studies*, *46*(3), 337–361. https://doi.org/10.1111/j.1467-6486.2009.00824.x

Herrington, M., & Kew, P., 2017. Global entrepreneurship monitor: Global report 2016/17: Global Entrepreneurship Research Association (GERA).

Heunks, F. J. (1998). Innovation, creativity and success. *Small Business Economics*, *10*(3), 263–272. https://doi.org/10.1023/A:1007968217565

Hill, R. A., & Dunbar, R. I. (2003). Social network size in humans. *Human Nature*, *14*(1), 53–72. https://doi.org/10.1007/s12110-003-1016-y

Hill, S. A., & Birkinshaw, J. M. (2010). Idea sets: Conceptualizing and measuring a new unit of analysis in entrepreneurship research. *Organizational Research Methods*, *13*(1), 85–113. https://doi.org/10.1177/1094428109337542

Hmieleski, K. M., & Baron, R. A. (2009). Entrepreneurs' optimism and new venture performance: A social cognitive perspective. *Academy of Management Journal*, *52*(3), 473–488. https://doi.org/10.5465/amj.2009.41330755

Hoyte, C., Noke, H., Mosey, S., & Marlow, S. (2019). From venture idea to venture formation: The role of sensemaking, sensegiving and sense receiving. *International Small Business Journal: Researching Entrepreneurship*, *37*(3), 268–288. https://doi.org/10.1177/0266242618818876

Hsu, D. K., Simmons, S. A., & Wieland, A. M. (2017). Designing entrepreneurship experiments: A review, typology, and research agenda. *Organizational Research Methods*, *20*(3), 379–412. https://doi.org/10.1177/1094428116685613

Jack, S. L. (2005). The role, use and activation of strong and weak network ties: A qualitative analysis. *Journal of Management Studies*, *42*(6), 1233–1259. https://doi.org/10.1111/j.1467-6486.2005.00540.x

Johnson, W. R. (1978). A theory of job shopping. *The Quarterly Journal of Economics*, *92*(2), 261–278. https://doi.org/10.2307/1884162

Joubert, T., Inceoglu, I., Bartram, D., Dowdeswell, K., & Lin, Y. (2015). A comparison of the psychometric properties of the forced choice and Likert scale versions of a personality instrument. *International Journal of Selection and Assessment*, *23*(1), 92–97. https://doi.org/10.1111/ijsa.12098

Kahneman, D., & Tversky, A. (1979). Prospect theory: An analysis of decision under risk. *Econometrica*, *47*(2), 263–291. https://doi.org/10.2307/1914185

Kahneman, D., & Tversky, A. (2013). Prospect theory: An analysis of decision under risk. In D. Kahneman & A. Tversky (Eds.), *Handbook of the fundamentals of financial decision making: Part I* (pp. 99–127). World Scientific Publishing.

Kayes, D. C. (2002). Experiential learning and its critics: Preserving the role of experience in management learning and education. *Academy of Management Learning and Education*, *1*(2), 137–149. https://doi.org/10.5465/amle.2002.8509336

Kier, A. S., & McMullen, J. S. (2018). Entrepreneurial imaginativeness in new venture ideation. *Academy of Management Journal*, *61*(6), 2265–2295. https://doi.org/10.5465/amj.2017.0395

Killworth, P. D., Johnsen, E. C., Bernard, H. R., Shelley, G. A., & McCarty, C. (1990). Estimating the size of personal networks. *Social Networks*, *12*(4), 289–312. https://doi.org/10.1016/0378-8733(90)90012-X

Ko, E. J., & McKelvie, A. (2018). Signaling for more money: The roles of founders' human capital and investor prominence in resource acquisition across different stages of firm development. *Journal of Business Venturing*, *33*(4), 438–454. https://doi.org/10.1016/j.jbusvent.2018.03.001

Kolb, A. Y., & Kolb, D. A. (2009). Experiential learning theory: A dynamic, holistic approach to management learning, education, and development. In S. J. Armstrong & C. V. Fukami (Eds.), *The SAGE handbook of management learning* (pp. 42–68). Education and Development, Sage.

Kontinen, T., & Ojala, A. (2011). Network ties in the international opportunity recognition of family SMEs. *International Business Review*, *20*(4), 440–453. https://doi.org/10.1016/j.ibusrev.2010.08.002

Krueger, N. F., & Brazeal, D. V. (1994). Entrepreneurial potential and potential entrepreneurs. *Entrepreneurship Theory and Practice*, *18*(3), 91–104. https://doi.org/10.1177/104225879401800307

Kuratko, D. F., Hornsby, J. S., & Naffziger, D. W. (1997). An examination of owner's goals in sustaining entrepreneurship. *Journal of Small Business Management*, *35*(1), 24–33. https://www.proquest.com/docview/221006386

Lazear, E. (2004). Balanced skills and entrepreneurship. *American Economic Review*, *94*(2), 208–211. https://doi.org/10.1257/0002828041301425

Lazear, E. (2005). Entrepreneurship. *Journal of Labor Economics*, *23*(4), 649–680. https://doi.org/10.1086/491605

Lechner, C., & Dowling, M. (2003). Firm networks: External relationships as sources for the growth and competitiveness of entrepreneurial firms. *Entrepreneurship & Regional Development*, *15*(1), 1–26. https://doi.org/10.1080/08985620210159220

Leimar, O. (2010). Game theory and biology. In S. N. Durlauf, & L. E. Blume (Eds.), *Game Theory* (pp. 119–126). Palgrave Macmillan.

Lerner, D. A., Hunt, R. A., & Dimov, D. (2018). Action! Moving beyond the intendedly-rational logics of entrepreneurship. *Journal of Business Venturing*, *33*(1), 52–69. https://doi.org/10.1016/j.jbusvent.2017.10.002

Lohrke, F. T., Holloway, B. B., & Woolley, T. W. (2010). Conjoint analysis in entrepreneurship research a review and research agenda. *Organizational Research Methods*, *13*(1), 16–30. https://doi.org/10.1177/1094428109341992

Lounsbury, M., & Glynn, M. A. (2001). Cultural entrepreneurship: Stories, legitimacy, and the acquisition of resources. *Strategic Management Journal*, *22*(6–7), 545–564. https://doi.org/10.1002/smj.188

Lykken, D. T. (1968). Statistical significance in psychological research. *Psychological Bulletin*, *70*(3, Pt.1), 151–159. https://doi.org/10.1037/h0026141

Maine, E., & Garnsey, E. (2006). Commercializing generic technology: The case of advanced materials ventures. *Research Policy*, *35*(3), 375–393. https://doi.org/10.1016/j.respol.2005.12.006

Matricano, D. (2016). The impact of intellectual capital on start-up expectations. *Journal of Intellectual Capital*, *17*(3), 654–674. https://doi.org/10.1108/JIC-04-2016-0040

Matricano, D. (2018). Grey vs. young entrepreneurs: Are they really different in terms of entrepreneurial intentions? Empirical evidence from Italy. *International Journal of Business and Management*, *13*(2), 76–86. https://doi.org/10.5539/ijbm.v13n2p76

Matricano, D. (2020). Higher education and start-up intentions: The role of intellectual capital in entrepreneurial processes. *Industry and Higher Education*, *34*(3), 151–159. https://doi.org/10.1177/0950422219886259

McCall, M. W., Jr. (2004). Leadership development through experience. *Academy of Management Perspectives*, *18*(3), 127–130. https://doi.org/10.5465/ame.2004.14776183

McGee, J. E., Peterson, M., Mueller, S. L., & Sequeira, J. M. (2009). Entrepreneurial self-efficacy: Refining the measure. *Entrepreneurship: Theory and Practice*, *33*(4), 965–988. https://doi.org/10.1111/j.1540-6520.2009.00304.x

McGrath, J. E. (1981). Dilemmatics: The study of research choices and dilemmas. *American Behavioral Scientist*, *25*(2), 179–210. https://doi.org/10.1177/000276428102500205

McGrath, R. G., & MacMillan, I. C. (1995). Discovery-driven planning. *Harvard Business Review*, *73*(July–August), 44–52. https://hbr.org/1995/07/discovery-driven-planning

McMullen, J. S., & Shepherd, D. A. (2006). Entrepreneurial action and the role of uncertainty in the theory of the entrepreneur. *Academy of Management Review*, *31*(1), 132–152. https://doi.org/10.5465/amr.2006.19379628

Mehta, N., Rajiv, S., & Srinivasan, K. (2003). Price uncertainty and consumer search: A structural model of consideration set formation. *Marketing Science*, *22*(1), 58–84. https://doi.org/10.1287/mksc.22.1.58.12849

Mitchell, R. K., Busenitz, L., Lant, T., McDougall, P. P., Morse, E. A., & Smith, J. B. (2002). Toward a theory of entrepreneurial cognition: Rethinking the people side of entrepreneurship research. *Entrepreneurship: Theory and Practice*, *27*(2), 93–104. https://doi.org/10.1111/1540-8520.00001

Moser, A. K. (2016). Buying organic–decision-making heuristics and empirical evidence from Germany. *Journal of Consumer Marketing*, *33*(7), 552–561. https://doi.org/10.1108/JCM-04-2016-1790

Mullen, M. R., Budeva, D. G., & Doney, P. M. (2009). Research methods in the leading small business–entrepreneurship journals: A critical review with recommendations for future research. *Journal of Small Business Management*, *47*(3), 287–307. https://doi.org/10.1111/j.1540-627X.2009.00272.x

Mullins, J. W., & Forlani, D. (2005). Missing the boat or sinking the boat: A study of new venture decision making. *Journal of Business Venturing*, *20*(1), 47–69. https://doi.org/10.1016/j.jbusvent.2003.08.001

Myerson, R. B. (2013). *Game theory: Analysis of conflict*. Harvard University Press.

Newell, A., & Simon, H. A. (1972). *Human problem solving*. Prentice Hall.

Norton, W. I., & Moore, W. T. (2006). The influence of entrepreneurial risk assessment on venture launch or growth decisions. *Small Business Economics*, *26*(3), 215–226. https://doi.org/10.1007/s11187-004-5612-y

Osborne, R. L. (1995). The essence of entrepreneurial success. *Management Decision*, *33*(7), 4–9. https://doi.org/10.1108/00251749510090520

Palich, L. E., & Bagby, D. R. (1995). Using cognitive theory to explain entrepreneurial risk-taking: Challenging conventional wisdom. *Journal of Business Venturing*, *10*(6), 425–438. https://doi.org/10.1016/0883-9026(95)00082-J

Parker, S. C. (2018). *The economics of entrepreneurship*. Cambridge University Press.

Payne, J. W., Bettman, J. R., & Johnson, E. J. (1993). The use of multiple strategies in judgment and choice. In N. J. Castellan (Ed.), *Individual and group decision making: Current issues* (pp. 19–39). Lawrence Erlbaum Associates.

Pool, I. S., & Kochen, M. (1978). Contacts and influence. *Social Networks*, *1*(1), 5–51. https://doi.org/10.1016/0378-8733(78)90011-4

Quińones, M. A., Ford, J. K., & Teachout, M. S. (1995). The relationship between work experience and job performance: A conceptual and meta-analytic review. *Personnel Psychology*, *48*(4), 887–910. https://doi.org/10.1111/j.1744-6570.1995.tb01785.x

Reuber, A. R., Fischer, E., & Coviello, N. (2016). Deepening the dialogue: New directions for the evolution of effectuation theory. *Academy of Management Review*, *41*(3), 536–540. https://doi.org/10.5465/amr.2015.0217

Reuer, J. J., Tong, T. W., Tyler, B. B., & Ariño, A. (2013). Executive preferences for governance modes and exchange partners: An information economics perspective. *Strategic Management Journal*, *34*(9), 1104–1122. https://doi.org/10.1002/smj.2064

Sarasvathy, S. D. (2001). Causation and effectuation: Toward a theoretical shift from economic inevitability to entrepreneurial contingency. *Academy of Management Review*, *26*(2), 243–263. https://doi.org/10.5465/amr.2001.4378020

Savage, S. J., & Waldman, D. M. (2008). Learning and fatigue during choice experiments: A comparison of online and mail survey modes. *Journal of Applied Econometrics*, *23*(3), 351–371. https://doi.org/10.1002/jae.984

Scheaf, D. J., Loignon, A. C., Webb, J. W., Heggestad, E. D., & Wood, M. S. (2020). Measuring opportunity evaluation: Conceptual synthesis and scale development. *Journal of Business Venturing*, *35*(2), 105935. https://doi.org/10.1016/j.jbusvent.2019.04.003

Schneider, J. (1976). The "greener grass" phenomenon: Differential effects of a work context alternative on organizational participation and withdrawal intentions. *Organizational Behavior and Human Performance*, *16*(2), 308–333. https://doi.org/10.1016/0030-5073(76)90019-2

Schwarz, N., Bless, H., Strack, F., Klumpp, G., Rittenauer-Schatka, H., & Simons, A. (1991). Ease of retrieval as information: Another look at the availability heuristic. *Journal of Personality and Social Psychology*, *61*(2), 195–202. https://doi.org/10.1037/0022-3514.61.2.195

Selya, A. S., Rose, J. S., Dierker, L. C., Hedeker, D., & Mermelstein, R. J. (2012). A practical guide to calculating Cohen's f^2, a measure of local effect size, from PROC MIXED. *Frontiers in Psychology*, *3*, 111. https://doi.org/10.3389/fpsyg.2012.00111

Shah, A. K., & Oppenheimer, D. M. (2008). Heuristics made easy: An effort-reduction framework. *Psychological Bulletin*, *134*(2), 207–222. https://doi.org/10.1037/0033-2909.134.2.207

Shane, S. (2000). Prior knowledge and the discovery of entrepreneurial opportunities. *Organization Science*, *11*(4), 448–469. https://doi.org/10.1287/orsc.11.4.448.14602

Shane, S., & Eckhardt, J. (2003). The individual-opportunity nexus. In Z. A. Acs & D. B. Audretsch (Eds.), *Handbook of entrepreneurship research* (pp. 161–191). Springer.

Shepherd, D. A., & Zacharakis, A. (1999). Conjoint analysis: A new methodological approach for researching the decision policies of venture capitalists. *Venture Capital: An International Journal of Entrepreneurial Finance*, *1*(3), 197–217. https://doi.org/10.1080/136910699295866

Shepherd, D. A., Ettenson, R., & Crouch, A. (2000). New venture strategy and profitability: A venture capitalist's assessment. *Journal of Business Venturing*, *15*(5–6), 449–467. https://doi.org/10.1016/S0883-9026(98)00007-X

Shepherd, D. A., & Zacharakis, A. (2003). A new Venture's cognitive legitimacy: An assessment by customers. *Journal of Small Business Management*, *41*(2), 148–167. https://doi.org/10.1111/1540-627X.00073

Shepherd, D. A., & DeTienne, D. R. (2005). Prior knowledge, potential financial reward, and opportunity identification. *Entrepreneurship Theory and Practice*, *29*(1), 91–112. https://doi.org/10.1111/j.1540-6520.2005.00071.x

Shepherd, D. (2015). Party on! A call for entrepreneurship research that is more interactive, activity based, cognitively hot, compassionate, and prosocial. *Journal of Business Venturing*, *30*(4), 489–507. https://doi.org/10.1016/j.jbusvent.2015.02.001

Shepherd, D. A., Williams, T. A., & Patzelt, H. (2015). Thinking about entrepreneurial decision making: Review and research agenda. *Journal of Management*, *41*(1), 11–46. https://doi.org/10.1177/0149206314541153

Shepherd, D. A., & Zacharakis, A. (2018). Conjoint analysis: A window of opportunity for entrepreneurship research. In J. A. Katz & A. C. Corbett (Eds.), *Reflections and extensions on key papers of the first twenty-five years of advances (Advances in entrepreneurship, firm emergence and growth* (Vol. 20, pp. 149–183). Emerald Publishing.

Shepherd, D. A., Wennberg, K., Suddaby, R., & Wiklund, J. (2019). What are we explaining? A Review and agenda on initiating, engaging, performing, and contextualizing entrepreneurship. *Journal of Management*, *45*(1), 159–196. https://doi.org/10.1177/0149206318799443

Shepherd, D. A., & Gruber, M. (2020). The lean startup framework: Closing the academic-practitioner divide. *Entrepreneurship: Theory and Practice*, *45*(5), 967–998. https://doi.org/10.1177/1042258719899415

Simon, H. (1990). Invariants in human behavior. *Annual Review of Psychology*, *41*(1), 1–19. https://doi.org/10.1146/annurev.ps.41.020190.000245

Simon, M., Houghton, S. M., & Aquino, K. (2000). Cognitive biases, risk perception, and venture formation: How individuals decide to start companies. *Journal of Business Venturing*, *15*(2), 113–134. https://doi.org/10.1016/S0883-9026(98)00003-2

Sørensen, J. B., & Fassiotto, M. A. (2011). Organizations as fonts of entrepreneurship. *Organization Science*, *22*(5), 1322–1331. https://doi.org/10.1287/orsc.1100.0622

Spencer, S. J., Zanna, M. P, & Fong, G. T. (2005). Establishing a causal chain: Why experiments are often more effective than mediational analyses in examining psychological processes. *Journal of Personality and Social Psychology*, *89*(6), 845–851. https://doi.org/10.1037/0022-3514.89.6.845

Stuart, T. E., & Sorenson, O. (2007). Strategic networks and entrepreneurial ventures. *Strategic Entrepreneurship Journal*, *1*(3–4), 211–227. https://doi.org/10.1002/sej.18

Tesluk, P. E., & Jacobs, R. R. (1998). Toward an integrated model of work experience. *Personnel Psychology*, *51*(2), 321–355. https://doi.org/10.1111/j.1744-6570.1998.tb00728.x

Tversky, A., & Kahneman, D. (1974). Judgment under uncertainty: Heuristics and biases. *Science*, *185*(4157), 1124–1131. https://doi.org/10.1126/science.185.4157.1124

Tversky, A., & Kahneman, D. (1989). Rational choice and the framing of decisions. In B. Karpak & S. Zionts (Eds.), *Multiple criteria decision making and risk analysis using microcomputers* (pp. 81–126). Springer Science & Business Media.

Tversky, A., & Kahneman, D. (1992). Advances in prospect theory: Cumulative representation of uncertainty. *Journal of Risk and Uncertainty*, *5*(4), 297–323. https://doi.org/10.1007/BF00122574

Venkataraman, S. (1997). The distinctive domain of entrepreneurship research, an editor's perspective. In J. Katz (Ed.), *Advance in entrepreneurship, firm emergence, and growth* (pp. 119–138). JAI Press.

Vogel, P. (2017). From venture idea to venture opportunity. *Entrepreneurship Theory and Practice*, *41*(6), 943–971. https://doi.org/10.1111/etap.12234

Weinberger, E., Wach, D., Stephan, U., & Wegge, J. (2018). Having a creative day: Understanding entrepreneurs' daily idea generation through a recovery lens. *Journal of Business Venturing*, *33*(1), 1–19. https://doi.org/10.1016/j.jbusvent.2017.09.001

Wertz, F. J. (1999). Multiple methods in psychology: Epistemological grounding and the possibility of unity. *Journal of Theoretical and Philosophical Psychology*, *19*(2), 131–166. https://doi.org/10.1037/h0091173

Williams, D. W., & Wood, M. S. (2015). Rule-based reasoning for understanding opportunity evaluation. *Academy of Management Perspectives*, *29*(2), 218–236. https://doi.org/10.5465/amp.2013.0017

Williams, D. W., & Grégoire, D. A. (2015). Seeking commonalities or avoiding differences? Re-conceptualizing distance and its effects on internationalization decisions. *Journal of International Business Studies*, *46*(3), 253–284. https://doi.org/10.1057/jibs.2014.52

Williams, D. W., Wood, M. S., Michell, J. R., & Urbig, D. (2019). Applying experimental methods to advance entrepreneurship research: On the need for and publication of experiments. *Journal of Business Venturing*, *34*(2), 215–223. https://doi.org/10.1016/j.jbusvent.2018.12.003

Winborg, J., & Lanstrom, H. (2001). Financial bootstrapping in small businesses: Examining small business manager's resource acquisition behaviors. *Journal of Business Venturing*, *16*(3), 235–254. https://doi.org/10.1016/S0883-9026(99)00055-5

Wood, M. S., McKelvie, A., & Haynie, J. M. (2014). Making it personal: Opportunity individuation and the shaping of opportunity beliefs. *Journal of Business Venturing*, *29*(2), 252–272. https://doi.org/10.1016/j.jbusvent.2013.02.001

Wood, M. S., & Williams, D. W. (2014). Opportunity evaluation as rule-based decision making. *Journal of Management Studies*, *51*(4), 573–602. https://doi.org/10.1111/joms.12018

Wood, M. S., & McKelvie, A. (2015). Opportunity evaluation as future focused cognition: Identifying conceptual themes and empirical trends. *International Journal of Management Research*, *17*(2), 256–277. https://doi.org/10.1111/ijmr.12053

Zavala, A. (1965). Development of the forced-choice rating scale technique. *Psychological Bulletin*, *63*(2), 117–124. https://doi.org/10.1037/h0021567

Zellner, A., & Park, S. B. (1979). Minimum expected loss (MELO) estimators for functions of parameters and structural coefficients of econometric models. *Journal of the American Statistical Association*, *74*(365), 185–193. https://doi.org/10.1080/01621459.1979.10481636

Zhang, S. X., & Burg, E. V. (2019). Advancing entrepreneurship as a design science: Developing additional design principles for effectuation. *Small Business Economics*, *55*(3), 1–20. https://doi.org/10.1007/s11187-019-00217-x

Zhao, H., Seibert, S. E., & Hills, G. E. (2005). The mediating role of self-efficacy in the development of entrepreneurial intentions. *Journal of Applied Psychology*, *90*(6), 1265–1272. https://doi.org/10.1037/0021-9010.90.6.1265

Zimmer, C. (1986). Entrepreneurship through social networks. In D. A. Sexton & R. W. Smilor (Eds.), *The art and science of entrepreneurship* (pp. 3–20). Ballinger Publishing Company.

Appendix 1

Comparison of traditional conjoint and equivocal forced choice

In traditional conjoint studies, participants are given each variable at either a high or low level. This practice is susceptible to the "more is better" phenomenon, where participants focus on the level and not the desirability of the variable (Bouchereau & Rowlands, 2000; Desmet & Parente, 2010). Similarly, given our interest in evaluating individuals' relative preferences, we would need to look at the trade-offs between two variables in a traditional conjoint study. In traditional conjoint study, participants evaluate some profiles with trade-offs and some without, which creates extraneous variance that can confuse the analysis of the trade-offs. As a result, we decided against a traditional conjoint approach because that would require either a substantially larger sample or risk the analysis being underpowered.

Instead, we use a variant of the traditional conjoint method – the EFC conjoint approach, where the focus is on the trade-offs between variables and not the part-weight scores of individual independent variables. EFC employs a series of forced choices (Gordon, 1951; Zavala, 1965), which ask participants to choose between two objectively equivalent choices for the same variable. For example, rather than having someone evaluate the desirability of more or less Coca-Cola, forced-choice methodology asks the person to evaluate the relative desirability of Coca-Cola versus another beverage (for example, Pepsi). Evidence from the psychology literature suggests that forced-choice questionnaires may have higher validity than other scaling methods (Joubert et al., 2015).

Our EFC conjoint experimental design identifies variable preferences by decomposing the participants' patterns of venture idea attractiveness ratings across all profiles. This new variant of conjoint analysis carries the adjective "equivocal" because each profile contains purposely balanced variables leaving participants to reveal which side of the trade-off they prefer. It is important empirically to keep variables equivocal so that participants consider prioritizing venture ideas with the variables most relevant for them. Importantly, through this process, we introduced only random variation but no systematic variation because we carefully designed and pretested the equivocal duality of the variables not to be prone to priming or other suggestions that would introduce systematic variance into our experiment.

In our EFC conjoint experiment, PEs were presented with a series of eight hypothetical conjoint profiles (plus an example conjoint profile). They were asked to imagine venture ideas they would consider pursuing and then asked to prioritize one in each conjoint profile. We included three forced-choice trade-offs in each of the eight unique conjoint profiles so that each profile has one trade-off for each of our three independent variables (see Appendix 2). Respondents rated each profile independently, and their relative preferences were assessed based on how each variable trade-off affected the changes in their ratings across the eight profiles. While forcing someone to choose between education or work experience when venturing does not seem necessarily realistic, our rationale for why it is valuable is as follows. Different opportunities are likely to align with certain criteria, and prioritizing venture ideas is partially based on their relative preferences. Since both the criteria's alignment with the opportunity and entrepreneurs' preferences represent the complex, meaningful, and difficult

decisions entrepreneurs must regularly undertake, it is meaningful to position them as trade-offs. In short, our EFC conjoint study focused on the difficult, yet meaningful, interactions between three sets of independent variable trade-offs rather than on traditional "more is better" single variable main effects.

We propose that there were three key advantages of EFC conjoint analysis in this study: efficiency, power, and accuracy. Efficiency resulted from the fact that respondents focused on eight analytically critical conjoint profiles with three trade-offs. In a traditional conjoint approach, getting the same insights on critical trade-off decision-making would require six independent variables and 64 (2^6) potential conjoint profile combinations (or 32 [2^{6-1}] fractioned conjoint profile combinations) to test all possible combinations, including "easy to make" and "obvious" choices without trade-offs.

Related to efficiency, the EFC conjoint design also improved statistical power. We asked the participants to focus on meaningful decisions for our investigation (the interaction of the independent effects). Focusing them resulted in more concentrated responses and less erroneous artificially introduced variance. In other words, we expect this method will demonstrate higher consistency in responses and reduce systematic variance attributable to the decision-making scenarios. The focused reduction in available trade-off variance and thus in decreased standard errors provided sufficient power to detect the hypothesized effects.

Finally, our EFC conjoint experiment provided higher accuracy. In general, the more conjoint profiles a participant looks at, the higher the chances that his or her decision-making reflects exercise-induced choice heuristics. However, offering only eight conjoint profiles reduced the likelihood of expertise-based heuristics forming (Bonsall & Lythgoe, 2009; Savage & Waldman, 2008) and/or impacting the participants' choices. Each side of each trade-off was presented only four times, thus increasing the likelihood that each variable received full consideration and hence, accurately reflected the participants' relative preferences.

Appendix 2

Experiment task introduction and case example profile as shown in the qualtrics data collection instrument

Assumptions:

(1) You are interested in starting an innovation project.
(2) You are making decisions in the context of your current or most recent business environment.
(3) Each case is a separate situation, independent of all others. Apart from the conditions we specify, all else is equal for each case.

Characteristics:

(a) Formal Education vs Experience

Education ≥ Experience: You have relevant formal education but no experience relevant to this opportunity.

Experience ≥ Education: You have relevant experience but no formal education relevant to this opportunity.

(b) Strong vs Weak Network Ties (or Close vs Wide Social Networks)

Strong Ties ≥ Weak Ties: Relevant to this opportunity, you have few weak ties (acquaintances that can help from the extended social network) but many strong ties (close friends that can help from within the immediate social network).

Weak Ties ≥ Strong Ties: Relevant to this opportunity, you have many weak ties (acquaintances that can help from the extended social network) but few strong ties (close friends that can help from within the immediate social network).

(c) Chance of Success

Small probability of high reward: There is a 20% chance to realize 80% of your professional objectives with this venture.

High probability of small reward: There is an 80% chance to realize 20% of your professional objectives with this venture.

Case Example:

Education and Experience	Education > Experience
Strong Ties and Weak Ties	Strong Ties > Weak Ties
Chance of Success	Small Probability of High Reward