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Strategic orientations of nascent entrepreneurs: antecedents of prediction and risk orientation

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Abstract Entrepreneurial judgment is crucial for entrepreneurial success. Extant literature argues that prior experience influences entrepreneurial decisions and the identification of attractive decision spaces for entrepreneurial activity is impacted by subjective risk perception and response to this risk. We posit that entrepreneurs develop different preferences for risk and prediction and their decisions reflect these preferences. To understand the strategic orientations of nascent entrepreneurs, using a sample of 262 nascent entrepreneurs, we study the impact of prior experience and the environmental context on the development of two strategic orientations of nascent entrepreneurs: risk orientation, i.e., the extent to which an individual perceives risk as downside loss or an upside opportunity and the prediction orientation, i.e., the extent to which an individual focuses on prediction. In doing so, our study contributes to a better understanding of the strategy formation process among nascent entrepreneurs.

Keywords Nascent entrepreneurs · Strategic orientations · Prediction orientation · Risk orientation

JEL classification C31 · C38 · D81 · L26 · M13

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1 Introduction

Entrepreneurial judgment impacts entrepreneurial performance and success (Uygur and Kim 2014). Risk plays a pivotal role in entrepreneurial judgment which can be characterized as decision-making under uncertainty (Foss et al. 2007; Mullins and Forlani 2005). Risk reflects the degree of uncertainty and potential loss resulting from entrepreneur's behavior (Forlani and Mullins 2000). The feeling of risk arises from the perception of various aspects of decision problems and is driven by either the fear of losing (affordable loss) or the desire to win (return maximization) (Brehmer 1987; Forlani and Mullins 2000; Janney and Dess 2006; Sarasvathy 2001). Furthermore, the response to perceived risk and uncertainty may include active use of predictive or non-predictive strategies (Sarasvathy 2001). Hence, risk and prediction orientations are core strategic orientations in the entrepreneurial context. Extant research asserts that entrepreneurs develop different preferences for how they perceive and manage risk and their subsequent decisions reflect their strategic

orientations (Gustafsson 2006; Ireland et al. 2003; Read and Sarasvathy 2005).

Yet, understanding of what influences entrepreneurial judgment and how individuals perceive and respond to risk and whether they focus on prediction or rather aim at controlling the environment remains under scrutinized. The cognition literature asserts that strategic orientations and strategies frequently emerge as the reflection of decisions taken over time and the cognitive processes that lead them including heuristics and biases (Kahneman 2011; Kisfalvi 2002). Therefore, past experiences are likely to impact current strategic orientations and decision-making which in consequence shape how the business opportunities are pursued. For example, Ireland et al. (2003) distinguish between orientations towards opportunity-seeking and advantage-seeking that influence the type of opportunity entrepreneurs select; effectuation research suggests that entrepreneurs either use control or prediction based-logics to realize opportunities (Sarasvathy 2001). Subjective judgments of the environment influence how entrepreneurs identify and create attractive decision spaces for their entrepreneurial activity (Kisfalvi 2002). Thus, the study of the role of nascent entrepreneurs' prior experience and situational context is crucial for understanding their business opportunity-related decision-making.

To fill the theoretical void and to understand how strategic orientations are influenced, we study the impact of prior experience (i.e., founding experience and prior work experience in established organizations) and the environmental context (i.e., perceived environmental dynamism) on the development of two strategic orientations of nascent entrepreneurs: the extent to which an individual perceives risk as downside loss or an upside opportunity (i.e., risk orientation) (Janney and Dess 2006; Sarasvathy 2001) and the extent to which an individual focuses on prediction versus non-prediction (i.e., the prediction orientation) (Sarasvathy 2001; Wiltbank et al. 2006). On the one hand, research asserts that prior work and industry experience affect how individuals perceive business opportunities (Alvarez and Barney 2007; Ardichvili et al. 2003; Shane 2000). For instance, founding experience can assist entrepreneurs in operating subsequent businesses (Ucbasaran et al. 2003). In a recent meta-analysis, Mayer-Haug et al. (2013) show that different elements of experience can play a vital role for subsequent elements of performance. On the other hand, also environmental dynamics and the perceived market innovativeness have been shown to influence entrepreneurs' perceptions of risk and predictability of the future. There is evidence that under the conditions of uncertainty and ambiguity a strictly sequential and formalized approach might be difficult to pursue especially given the entrepreneur's scarce resources (e.g., Brinckmann et al. 2010; Gruber 2007). We chose to focus on the two specific strategic orientations because they have been highlighted in previous research as crucial for the drafting of the entrepreneurial decision space; they also hold special relevance in contexts of novelty, uncertainty, and dynamism (McMullen and Shepherd 2006; Wiltbank et al. 2006). While the prediction orientation reflects the entrepreneurs' preferred level of focus on forecasts and expectations vs. a more action and control-oriented approach as a way to manage perceived risks, the risk orientation reflects the attitude towards seeing risk either as downside loss or upside opportunity. We examine their antecedents using a sample of nascent entrepreneurs who are in the process of establishing their ventures.

This study makes two principal contributions to the literature. First, we examine the role of previous experience and environmental dynamism on the strategic orientations of nascent entrepreneurs. Second, building on the notion that individuals pursue different strategic orientations simultaneously (e.g., Baron and Ensley 2006; Chandler et al. 2011), we find that risk orientation has its antecedents in personal characteristics (experience), while prediction orientation appears to be influenced by external variables (environmental dynamism). This is important because it highlights specific cognitive judgments regarding perceived decision space which in turn contributes to explaining subsequently pursued strategies. Our research also acknowledges the multidimensionality of the cognitive phenomenon highlighted by prior entrepreneurship research (Haynie et al. 2010; Mitchell et al. 2008). Taken together, our findings contribute to a better understanding of the strategy formation of nascent entrepreneurs and introduce strategic orientations as individual-level constructs.

2 Theory and hypotheses development

2.1 Entrepreneur's individual strategic orientations

Effectuation and causation are considered two dominant decision-making logics (Dew et al. 2009; Sarasvathy 2001). The causal approach relies heavily on prediction

and analyses and is considered more appropriate in stable contexts, while effectual approach assumes reliance on five principles—bird-in-hand, affordable-loss, crazy-quilt, lemonade, and pilot-in-the-plane (Sarasvathy 2008; Welter and Kim 2018)—and prevails in more dynamic and uncertain contexts (Dew et al. 2015). Sarasvathy (2008) argues that effectual approach also reflects expert decision-making.

Entrepreneurs and nascent entrepreneurs, in particular, often do not have pre-determined decision-making policies, but their strategies take shape through their actions (Fredrickson and Iaquinto 1989). Engaging in an entrepreneurial action to pursue own dreams and desires, entrepreneurs base own decisions on simplifying cognitive strategies that are particularly valuable in uncertain and complex situations (Busenitz and Barney 1997). Their strategies emerge as a reflection of their worldviews and interpretations of the environment (Kisfalvi 2002). More specifically, it has been argued that "how a person frames a particular problem will determine what they experience as relevant phenomena, what they count as data, what inferences they make about the situation, and how they conceptualize it" (Johnson and Lakoff 2002: 246). Therefore, it is important to understand what influences entrepreneurs' perceptions and the way they allocate resources to realize their ideas. We refer to this individual-level framing as *strategic orientations* and define them as strategic postures capturing key components that drive entrepreneurial decision-making and direct entrepreneurial actions. We focus on two strategic orientations along two separate dimensions: approach to risk (Janney and Dess 2006; March and Shapira 1987) and approach to prediction (Wiltbank et al. 2006). These two dimensions describe a core decision space in an entrepreneurial realm (Simon et al. 2000). More specifically, because entrepreneurs' decision-making takes place in situations where historical trends and previous levels of performance are unknown and only limited market information is available (Miller and Friesen 1984), the approach to risk (affordable-loss principle) and approach to predictability as reflection of entrepreneurial agency or lack of it (the pilot-in-the-plane principle) are important for influencing the type of entrepreneurial endeavors that entrepreneurs engage in.

Given that predictive logic frames the future as a continuation of the past (Dew et al. 2009) and that being able to predict future developments may enable choosing strategies leading towards success (Sarasvathy 2001; Wiltbank et al. 2006), we define *prediction orientation* as a strategic posture reflecting the preferred level of focus on forecasts and expectations acceptable to a given individual. Moreover, given that risk in entrepreneurship has been conceptualized in three different ways: as a variance (Brown and Warner 1985), as a downside loss (i.e., hazard) (Lumpkin and Dess 1996; March and Shapira 1987) and as an upside opportunity (Gimeno et al. 1997), we follow Janney and Dess's (2006) suggestion to focus on risk as the outcome of decisions (i.e., risk framing) and define *risk orientation* as a strategic posture reflecting either the perceived downside loss or upside opportunity acceptable to a given entrepreneur. In the entrepreneurship context, risk perception as either loss or opportunity is particularly important because it has been shown that it influences the preparedness of entrepreneurs to engage or not in an entrepreneurial activity. The level of acceptable risk—amplitude—has been shown to be subjectively and contextually determined, and framing as a loss can lead at times to risky behaviors (Scholer et al. 2010). Consequently, our conceptualization of strategic orientation reflects the guiding principles of decision-making given the perceived decision space (*the* "*why*").

Although strategic orientations are frequently modeled as independent, randomly distributed variables, substantial literature suggests that these assumptions are questionable. Following cognition literature, strategic orientations of the individual are shaped by a multitude of factors including previous experiences and perceived contextual factors (e.g., Baron 1998; Baron and Ensley 2006; Dencker et al. 2009; Shepherd and DeTienne 2005). We build on this literature and scrutinize three key antecedents (i.e., previous work experience in established firms, previous work experience in new firms, and perceived environmental uncertainty) that can be expected to influence the focal strategic orientations (i.e., prediction orientation and risk orientation). Figure 1 displays the research framework.

2.2 Impact of prior work experience in established firms on strategic orientations

Predictive logic presumes what can be predicted can be controlled (Wiltbank et al. 2006). The need for prediction generally increases as the complexity of organizations increases (Stone and Brush 1996). More specifically, Brinckmann et al. (2010) show that as the operations of a firm become more established, the firm may

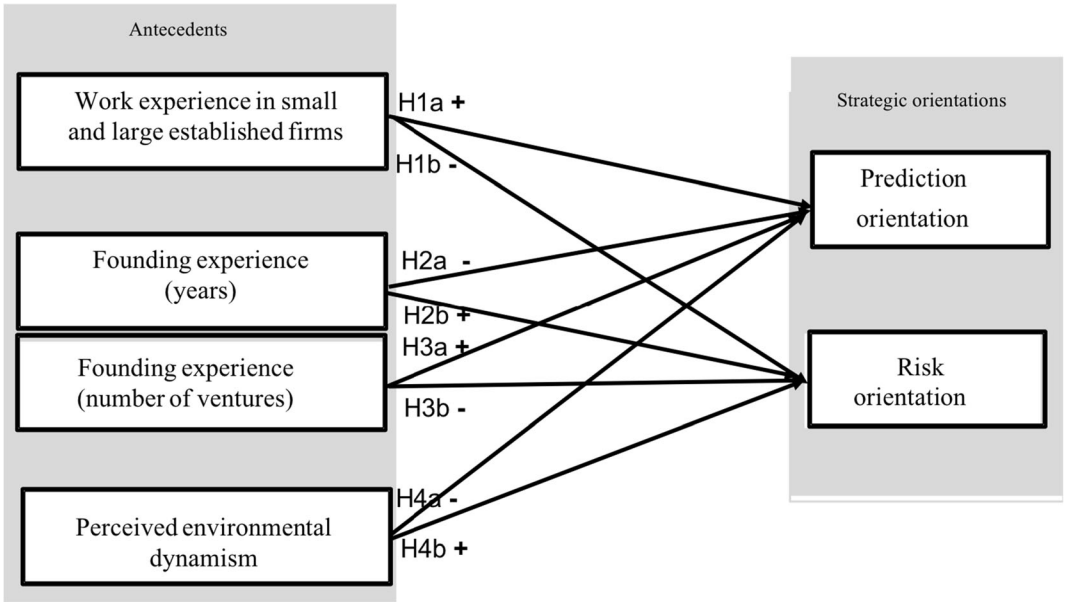

Fig. 1 Research framework—hypothesized effects on strategic orientations

draw on prediction approaches to a greater extent in order to improve subsequent performance. Managers of established organizations are frequently accustomed to predict future scenarios and prepare business plans in order to allocate resources effectively and efficiently and to communicate with others inside and outside the organization (Mintzberg and Waters 1985; Wiltbank et al. 2006). Established firms frequently undertake forms of predicting future by engaging in planning activities (e.g., Grant 2003; Upton et al. 2001). More specifically, established firms usually possess established processes and routines and operate in already existing markets, where decisions can rely, at least partly, on trends and past performance (Wiltbank et al. 2009).

Further, work experience contributes to competence development in a given domain (Becker 1975). This basic human capital argument predicts that the more exposure individuals receive to certain behaviors, the more likely that they will become more skillful and effective at exhibiting these behaviors. Thus, as individuals join an established organization, they are exposed to various predictive practices, including business planning employed in the firm. The exposure to these practices over time is likely to increase their competence in applying these tools (Becker 1975; Shrader and Siegel 2007). Furthermore, their normative attribution of business planning and prediction to successful actuation in business environments can be expected to strengthen. Hence, as these managers start new ventures, they might be prone to follow their normative perceptions, apply their competence, and practice behaviors learned in previous business contexts. Therefore, we propose the following

> H1a: *Prior work experience in both small and large established firms increases a nascent entrepreneur's focus on prediction orientation.*

Individuals with greater work experience in established firms have greater human capital (Becker 1975). Following prior arguments, individuals with more experience in established firms are able to perceive a greater number of business opportunities and possess greater business insights, information processing abilities, and managerial knowledge than individuals who lack these experiences (Shane 2000; Unger et al. 2009). This broadens the variety of possible career options available to them and translates into higher opportunity costs for the experienced individuals (Becker 1975).

Despite the fact that for the majority, risk signifies primarily losses not gains (Forlani and Mullins 2000) and risky decisions contain a threat of a poor outcome (March and Shapira 1987), individuals with higher human capital are likely to take greater risks (Heath and Tversky 1991). Similarly, Weiner (1985) suggests in his attribution theory that individuals who attribute

outcomes of their actions to internal controllable factors, like effort or skill, will be more likely to approach risks more positively. Consequently, entrepreneurs with high self-efficacy about their skills resulting from years of experience (mastery of skills) believe that they can succeed and are likely to see risks as upside opportunities (Chen et al. 1998; Krueger and Dickson 1994; McGee et al. 2009; Zhao et al. 2005).

Furthermore, individuals with more work experience in established firms might perceive their increased abilities as an effective way to address potential challenges arising from risky decisions (Heath and Tversky 1991). Based on these arguments, we conjecture that individuals with greater managerial experience in established firms will make decisions focusing more on the possible upside opportunities rather than thinking about the possible downside loss. Hence, we propose the following:

> H1b: *Prior work experience in both small and large established firms increases a nascent entrepreneur's focus on the upside opportunity rather than downside loss.*

2.3 Impact of prior work experience in new firms on strategic orientations

Entrepreneurial experience is likely to impact entrepreneurs' strategic orientations. Extant research asserts that prior work experience in new firms has the potential to change the way entrepreneurs search for information needed to further their venturing ideas (Cooper et al. 1995) and how they use the collected information (Read and Sarasvathy 2005). More specifically, in terms of search patterns, although individuals without prior entrepreneurial experience search more than experts (Cooper et al. 1995); experienced entrepreneurs engage more in active search that enable them to focus on the controllable aspects of their opportunity (Fiet et al. 2004) and gather more detailed information for a better understanding of the target market (Mullins and Forlani 2005).

However, where the experienced entrepreneurs differ most from those without such experience is how they subsequently hesitate to use the collected information for predictive modeling. The years of entrepreneurial experience result in development and subsequent use of entrepreneurial heuristics (Busenitz and Barney 1997; Busenitz and Arthurs 2007; Mitchell et al. 2008) as well as entrepreneurs developing self-efficacious beliefs about their competence level that encourage them to trust own knowledge and perceptions rather than provided market information (Read and Sarasvathy 2005; Chen et al. 1998; Zhao et al. 2005). Additionally, having experienced firsthand the complexity and unpredictability of the entrepreneurial process, experienced entrepreneurs understand that prediction is only possible in rather stable environments (Wiltbank et al. 2006). Acting on opportunity often requires that entrepreneurs create new markets for their value propositions and this implies that referring to prediction is not possible as there is no market information or no performance statistics that could help and enable predictive behavior for the entrepreneurs (Miller and Friesen 1984; Sarasvathy 2001). Moreover, the opportunity costs of business planning might be higher for more experienced entrepreneurs leading them to avoid predictive activities and instead begin to do things unless they are formally requested to provide a business plan which reflects predictions about the intended business in an attempt of securing external funding (e.g., Honig and Karlsson 2004; Kirsch et al. 2009). Consequently, founders with extensive prior experience in new firms are less likely to focus on predictive actions. Hence, we propose the following:

> H2a: *Prior work experience in form of the amount of time spent in new firms decreases a nascent entrepreneur's prediction orientation.*

However, experience can be measured not only as depth, i.e., the amount of time spent in a venture, but also as the breadth, i.e., frequency of the repetitiveness of the tasks leading to the development of routines as entrepreneurs engage in the start-up process again and again. Shane's (2000) research exemplified that when developing new opportunities, entrepreneurs often rely on prior knowledge and previously held assumptions. Similarly, entrepreneurs who seek external funding and often engage in prediction and business planning activities are likely to perceive that these activities improve their understanding of the dynamics of the venturing process (Delmar and Shane 2003). Moreover, following human capital considerations, they build up unique insights and specific planning skills that they can use in subsequent ventures. As they engage in new ventures or in parallel ventures, they might require financing for these subsequent, presumably ambitious or additional

activities which in turn would require some form of prediction or planning related activities.

Consequently, we expect that individuals with previous habitual (whether serial or portfolio) work experience in new firms have more specific knowledge about specific effective prediction activities in the new venture domain and will hence show an increased prediction orientation.

> H3a: *Prior work experience in form of number of newly started ventures increases a nascent entrepreneur's prediction orientation.*

Prior research indicates that experienced entrepreneurs focus on how much they are prepared to lose rather than thinking about the possible opportunity gains (Dew et al. 2009; March and Shapira 1987; Dew et al. 2008; Sarasvathy 2001). Especially in an uncertain environment, concentrating on reducing the downside losses can be rational and advisable (Sarasvathy 2001; Chandler et al. 2011). Frequently, the preference to see risk as a downside loss instead of potential upside opportunity accrues from the entrepreneur's work experience in new firms since they realized the uncertain nature of the entrepreneurial process in previous projects or may have experienced business failure.

Moreover, when acting on a business opportunity, the entrepreneurs frequently have to commit their own resources rather than simply manage resources available in an established firm (Stevenson and Gumpert 1985). If they pursue one venture, their own committed resources are at substantial failure risk, and they have limited ways to distribute the risk across ventures. Thus, the larger share of own resource endowments committed to their venture is likely to draw the nascent entrepreneur's attention to the risk as a potential downside loss rather than upside opportunity especially if they have experienced the risks of starting ventures before. Hence, we hypothesize that experienced entrepreneurs focus on reducing downside loss rather than think about upside opportunity:

> H2b: *Prior work experience in form of the amount of time spent in a new firm increases a nascent entrepreneur's focus on the downside loss rather than as upside opportunity.*

However, building on feedback from previous founding experience, entrepreneurs engaging in starting-up further ventures are likely to perceive lower risk associated with the new efforts (Forlani and Mullins 2000). Similarly, habitual entrepreneurs are more likely to engage in starting another independent venture, while novice entrepreneurs organize the new idea internally (Wiklund and Shepherd 2008). This means that portfolio entrepreneurs who manage a number of ventures at the same time are likely to consider the potential loss but focus on the overall positive outcome when managing their venture portfolio as they can distribute the risk over various ventures that they start simultaneously or in sequence. If one venture fails, they have the other ventures or may start another venture shortly thereafter. Consequently, we believe that habitual entrepreneurs are more likely to focus on the upside opportunity associated with starting a new venture rather than the potential downside loss.

> H3b: *Prior work experience in form of number of newly started ventures increases a nascent entrepreneur's focus on the upside opportunity rather than downside loss.*

2.4 Impact of perceived environmental dynamism on strategic orientations

Environmental dynamism captures the instability of the business environment that denotes rapid and discontinuous changes in an organization's environment (Henderson and Stern 2004; Fredrickson and Mitchell 1984; Eisenhardt 1989; Hough and White 2003). Huff et al. (1992) introduce the notion of *organizational stressors* as a set of positive (new inventions, new resources, deregulation, etc.) or negative (lawsuits, lost contracts, etc.) environmental changes that create pressure on the organization. In the context of new ventures, environmental dynamism can be an organizational stressor leading to a higher degree of *trial and error* orientation (Nicholls-Nixon et al. 2000). At the same time, the opportunities arising from environmental dynamism can provide positive contingencies for nascent entrepreneurs (Sarasvathy 2001). Furthermore, extensive literature highlights that greater degrees of prediction activities are more appropriate in stable environments while in dynamic, uncertain environments, limited planning, actuation, and flexibility might be of utmost importance (e.g., Gruber 2007; Wiltbank et al.

2006; Davis et al. 2009). Based on these arguments, we propose the following:

H4a: *Perceived environmental dynamism decreases a nascent entrepreneur's prediction orientation.*

Entrepreneurs who perceive a higher level of environmental dynamism and experience inability to accurately predict face a higher level of uncertainty and ambiguity (Milliken 1987). The increased uncertainty and ambiguity, in turn, results in difficulties of calculating expected returns (Chandler et al. 2011). Moreover, the unpredictability of future conditions will likely lead to a focus on the limitation of risk as downside loss as illustrated in Sarasvathy's (2001) affordable loss principle. Chandler et al. (2011) concur that in environments of high uncertainty, entrepreneurs select alternatives based on loss affordability instead of selecting this alternative with the highest expected return. In other words, the higher the level of perceived environmental dynamism and hence uncertainty, the greater the tendency that entrepreneurs use principles highlighted by effectuation literature including a focus on risk as downside loss (Chandler et al. 2011; Sarasvathy 2001, 2008). Following this line of reasoning, we hypothesize the following:

H4b: *Perceived environmental dynamism increases a nascent entrepreneur's focus on the downside loss instead of upside opportunity.*

3 Methodology

3.1 Sample

To analyze the initial strategic orientations, we focus our study on nascent entrepreneurs. A nascent entrepreneur is an individual who, alone or with others, is trying to start a new business (based on PSED and GEM studies, cf. Carter et al. 1996; Cassar and Craig 2009; Davidsson 2006; Delmar and Davidsson 2000). Our sampling criteria required that the respondents (1) were expecting partial or full ownership in the new, prospective firm and (2) have been active in trying to start the new firm at the time of study, however for period not longer than past 18 months, and (3) who and whose start-up did not yet have a positive monthly cash flow that covers expenses and the owner-manager salaries for more than three months (Wagner 2007). Yet, if respondents considered their firms established, they were excluded from the study (Carter et al. 1996). It is well acknowledged that obtaining data on nascent entrepreneurs is a challenging task, mostly due to the difficulties with locating them in existing databases (e.g., Parker and Belghitar 2006; Reynolds and Curtin 2008). We follow the above-mentioned definition and sample nascent entrepreneurs assuming that the participation in business plan competitions can be regarded as an indicator of nascent entrepreneurship. Our sample was derived from the four major business plan competitions in Germany, including the NUK (Cologne), the MBPW (Munich), the BBPW (Berlin), and the Start2Grow (Dortmund). Since these business plan competitions are not linked to specific institutions like universities or businesses, they attract a wide range of nascent ventures. In sum, this allowed us to access a population of round 1400 nascent ventures. To gather empirical data from this population, we used a questionnaire-based approach to facilitate large-scale economic modeling. Prior to launching the survey, we conducted pre-tests with nascent entrepreneurs and gathered feedback from managers of each of the four competitions. To conduct the survey, we used a web-based questionnaire following the recommendations of the Tailored Design Method (TDM) proposed by Dillman (2007). TDM is built upon social exchange perspective that helps increase quality and quantity of response rate and helps reduce coverage, sampling, non-response, and measurement errors. This approach resulted in a sample of 262 nascent entrepreneurs (19% response rate). In order to analyze the existence of a response bias, we compared central data from early vs. late respondents including the percentage of team founders, founder's age, gender, percentage of technology ventures, degree of innovation, venture age, team size, and venture background. No significant difference was observed.

Given our focus on the cognition of the individual, we use a single-respondent approach. Usage of a single informant has been supported for well-designed and executed surveys as well as in cases where the key informant is the manager or owner of the respective business (e.g., Chandler and Lyon 2001; Starbuck and Mezias 1996). Additionally, Carroll and Mosakowski (1987: 4) argue that "because small firms are often the embodiment of their owner-managers, research conducted on them commonly emphasizes the

characteristics of those individuals" (see for example, Miller and Dröge 1986). Finally, given the comparably small number of individuals involved in each venture (mean of 2.2 individuals, median of 2.0), we believe that the self-reported, single-respondent strategic orientations greatly impact the emergent organizations gestalt.

On average, the entrepreneurs have been working for 10.2 months on their current venture idea. With respect to achievement of a first sale, 82% of respondents indicated absence of sales. Further, from the 262 responding individuals (response rate equals 19%), 91% were heading new independent ventures while the rest were leading spin-offs from existing firms. A total of 77% had no employees, 11% had one employee, and 12% more than two employees (average of 0.6 employees). With respect to industry, 78% of all ventures were from the services sector and 22% from the production sector. Of the ventures, 43% had a technology focus. Further, comparing characteristics of our sample with those obtained from data from a representative official survey of German entrepreneurs (KfW-Bankengruppe 2007), we find that while the founders tend to have similar individual characteristics, the team composition and industry focus are somewhat different. Ventures in our study sample are more often lead by an entrepreneurial team (63 vs. 10% in Germany), are more often technology-oriented (43 vs. 8% in Germany), and focus more often on production vs. services industries (22 vs. 13% in Germany). These differences can be partly explained by the assumption that the specific business plan competitions attract particularly nascent entrepreneurs who have serious intentions of establishing a business and are growth-oriented. More specifically, the regional- and government-sponsored competitions are often used to foster entrepreneurial activities, as the organizations provide a range of supporting activities next to the business plan contests, including seminars, individual coaching, and networking activities (Grichnik et al. 2014). Therefore, we conclude that due to the characteristics of the prominent European business plan competitions, individuals participating in these competitions and, thus, our sample do not represent the general population of nascent ventures, but rather a positive self-selection towards more ambitious and growth-oriented entrepreneurs. The characteristics of such sample—individuals likely to have (very) few years of working and/or founding experience and be more planning and prediction oriented—can lead to results being more conservative and showing more preference for high-prediction orientation and seeing risk as gain. Finding evidence of more effectual behavior and significant relationships among such sample could highlight the importance of our results for a more representative sample.

3.2 Measures

3.2.1 Strategic orientation variables

To extract adequate measures of the two strategic orientation constructs, we used existent literature and measures related to the constructs of risk and prediction to the greatest extent possible. At the time of the survey, most empirical research on effectual logic and prediction was mainly experimental or qualitative (e.g., Sarasvathy et al. 1998; Sarasvathy and Dew 2005). Similarly, the risk literature focused on risk propensity, while the focus on risk perception was predominantly captured by conceptual works and variations of conjoint analysis (Mullins and Forlani 2005; Janney and Dess 2006). To obtain a preliminary set of items, we studied the original literature, especially examples, case studies, and interview quotes used by Sarasvathy (2001, 2008). To further ensure face validity, we checked our preliminary items against questions from an existing empirical survey on effectual logic available at the effectuation.org website. As a last step, we tested and discussed our items with several entrepreneurs to further adjust the language to the diction of entrepreneurs. This process resulted in two 4-item construct measures each based on 6-point Likert scales (see Table 1 for all the items).

Prediction orientation. We began by carefully reviewing the definition of the prediction concept proposed by Sarasvathy (2001). Sample item includes the following: "In defining the target customers/markets (1) … the team concentrates on markets that it knows best or (6) … the team concentrates on getting more experience in ideal markets." Cronbach's alpha for the 4-item construct is 0.79.

Risk orientation. We referred to both Janney and Dess's (2006) definition of risk in entrepreneurial context as downside loss (i.e., hazard) versus upside opportunity (gain), as well as to Sarasvathy's (2001) concept of affordable loss and return maximization. Sample item includes the following: "In defining the product volume/features, your team makes decisions primarily based on (6) the

Table 1 Factor analysis results for strategic orientation constructs

Items	Factor		Cronbach's alpha
	1	2	
	Prediction orientation		
1. In determining the product design, the team focuses on features	**0.675**	0.297	**0.787**
(1) … according to the team's own appraisal of what is necessary for the success of the product			
(6) … according to expert market forecasts of what is necessary for the success of the product			
2. In defining the target customers/markets, the team focuses on segments or markets	**0.792**	0.197	
(1) … that it expects to be attractive, but have not yet been analyzed in detail			
(6) … that have been determined as the best areas based on complex forecasts and analyses by the team and/or market experts			
3. In defining the target customers/markets	**0.726**	0.033	
(1) … the team concentrates on markets that it knows best			
(6) … the team concentrates on getting more experience in ideal markets			
4. In implementing the new business idea, the team puts emphasis on	**0.808**	0.065	
(1) … a quick process with known customers, investors, suppliers			
(6) … forecasts and analyses of ideal customers, investors, suppliers			
	Risk orientation[a]		
5. When making an investment decision your team focuses first on	0.247	**0.774**	**0.772**
(6) … the potential maximum loss			
(1) … the potential maximum return			
6. In defining the production volume your team focuses on	0.101	**0.678**	
(6) … amounts that could be achieved with the available funds			
(1) … amounts that correspond to the ideal size of the company			
7. In defining the product volume/features your team makes decisions primarily based on	− 0.009	**0.837**	
(6) … the implementation costs in order to limit affordable losses			
(1) … the expected return			
8. In implementing the new business idea your team prefers	0.217	**0.737**	
(6) … an applicable/pragmatic approach in order to limit losses possibly personally incurred			
(1) … a profit-maximizing approach irrespective of the financial demands during implementation			

[a] Risk orientation scale was reverse-coded but readjusted prior to analyses for easier interpretation. Direction presented here and in the following are after re-adjustments for easier interpretation

implementation costs in order to limit affordable losses or (1) …the expected return." We used a reverse coded scale in the measurement but adjusted it for the analysis to make interpretation easier and in line with the labeling. A high score indicates the focus on risk of downside loss rather than upside potential. Cronbach's alpha for the 4-item construct is 0.77.

Measurement instruments need to be reliable and valid in order to empirically assess true and significant relationships and contribute to future theoretical developments. To prove reliability of constructs, the Cronbach's alpha criterion above or equal to 0.7 is a generally accepted internal consistency measure (Nunnally 1978), and our constructs fulfill the requirement. We ensured content-related validity through detailed comparison of prediction and respectively risk orientation items with related principles of effectual logic, such as *means-driven action* and *affordable loss* (Sarasvathy 2008; Wiltbank et al. 2006; Sarasvathy 2001), as well as discussions with entrepreneurs and experts familiar with this literature. In this study, the Kaiser-Meyer-Olkin (KMO) value was 0.771 and the Barlett's test is significant with $p < 0.000$ ($X^2 = 363.185$, df = 28). According to Agresti and Finlay (2009), these values are sufficient to assume a high degree of data appropriateness for factor analysis. Results of subsequent principal component-based factor analysis (Kaiser criterion, i.e., eigenvalues > 1) as well as reliability measures are presented in Table 1. For better interpretation of results, we used Varimax rotation and suppressed all loadings below 0.3. Table 1 shows that no item displays cross-loadings over 0.3. Thus, the exploratory factor analysis indicates that prediction orientation and risk orientation are two distinct and valid strategic

orientation constructs. To further ensure the distinctiveness of factors, we applied parallel analysis as a more sophisticated (and rather conservative) statistical method to identifying the number of factors. Parallel analysis represents an alternative factor criterion to the frequently employed Kaiser criterion (Hayton et al. 2004; Horn 1965; Begley and Boyd 1987). According to Zwick and Velicer (1982), parallel analysis is more recommendable than the traditionally used factor analysis since it enables more accurate assessment of the underlying factor structure. Based on the method described in Hayton et al. (2004), we find additional confirmation for the existence of two distinct factors. In sum, we find support that our strategic orientation measures are both reliable and valid and are, thus, appropriate for further analysis.

3.2.2 Work experience

Work experience has been often measured by the number of employment years (Becker 1975). We use three measures to provide a more differentiated understanding of the effects of work experience on the strategic orientations: employed work experience in established small and large firms as well as founding experience in new firms. *Work experience in small established firms* is defined as the value indicating the number of years during which the entrepreneur was employed by an organization with less than 100 employees. The *work experience in large established firms* measures the number of years during which the entrepreneur was employed by an organization with more than 100 employees. The division between small and large firms allows us to consider experience to be more generalist or specialist type experience. In line with our hypotheses, we measure the *entrepreneurial founding experience* in new firms as the number of previously started ventures and the number of years that entrepreneurs' ventures were in active operation. We adapted the double measure of work experience in new firms to capture both the amount of time as well as the frequency/repetitiveness of the experience (existence of entrepreneurs with multiple experiences). The VIFs of the variables were lower than 3; thus, we decided to use both measures in the subsequent analysis.

3.2.3 Perceived environmental dynamism

Perceived environmental dynamism as conceptualized in this study refers to the entrepreneur's perception of the likelihood with which changes in customer preferences, technology, and competitive strategies might occur (Priem et al. 1995). For this variable, we used a prominent 5-item scale with confirmed conceptual accuracy and statistical properties (Miller and Dröge 1986). Two examples of items used involve the following: "Your team expects that products and processes have to be changed frequently to keep up with the competition" and "It is almost impossible to predict consumer demand and taste in your target market (e.g., the fashion industry)." This construct had a Cronbach's alpha value of 0.73 indicating sufficient internal consistency for this measure.

3.2.4 Control variables

We incorporated a specific set of control variables to capture important effects which were highlighted by prior scholars and which might distort our findings. The first control variables capture the innovativeness of project. It can be assumed that especially projects characterized by high degrees of innovativeness affect the risk and prediction orientations of the entrepreneurs as higher degrees of innovativeness might make predictions more difficult or imply greater risks. For instance, Rosenbusch et al. 2011 discuss how different innovation types affect performance differently. Further, the financial capital available to the venture might affect how individuals act. For instance, with greater financial resources, they would have more opportunities to build their venture (Grichnik et al. 2014). Moreover, the financial resources could act as a buffer if predictions do not substantiate (Brinckmann et al. 2011). However, individuals that have more financial resources obtained might also see those financial resources at risk and hence pursue approaches to limit the likelihood of losing those financial resources. Additionally, we incorporated common variables describing the firm types (tech vs. less tech, service vs. product, or single-founded vs team-founded firms) as well as demographic characteristics of the individual being studied:

> *Innovativeness degree*. In line with prior research (e.g., Dencker et al. 2009), we used a self-developed 3-value scale indicating the

entrepreneur's perception of the degree of innovativeness of her business idea as follows: 1 for less innovative, 2 for innovative, and 3 for radical innovative.

Market-related innovativeness. Market-related innovativeness reflects the number of new market requirements and new customer groups to be addressed (Hauser et al. 2006). In other words, firms focusing on market-related innovativeness attempt to enter new markets and expand current customer groups by satisfying new needs with existing value propositions. In our study, this dummy variable indicates whether the innovativeness of the business idea is rather market-related (value 1) than product- and/or process-related (value 0).

Own financial capital. This variable takes values between 0 and 3 indicating the amount of funding available from the founder's own resources as follows: 0 for *not available/not intended*, 1 for available funds less than 25 thousand Euros, 2 for available funds between 25 and 50 thousand Euros, and 3 for available funds equal or exceeding 50 thousand Euros.

Bank financial capital. Similar to the prior variable, this value indicates the amount of venture funding available from bank capital. Also, this variable takes values between 0 and 3 as follows: 0 for *not available/not intended*, 1 for available funds less than 25 thousand Euros, 2 for available funds between 25 and 50 thousand Euros, and 3 for available funds equal or exceeding 50 thousand Euros.

Technical venture. This dummy variable indicates whether the focus of the new venture's activities lies on technology-related products or services (value 1) or not (value 0).

Service venture. This dummy variable indicates whether the intended offering is a service (value 1) or product (value 0).

Team founding. We additionally controlled for confounding effects of teams. Hence, we introduced a dummy variable distinguishing between single entrepreneurs (value 0) and team-based venture (value 1).

Founder's age. Given that the existing professional experience of the entrepreneurs is measured by the number of years of prior work employment, it is useful to control for the age of the entrepreneur.

Founder's gender. Gender-related entrepreneurship research suggests existence of differences between male and female with respect to the entrepreneurial process (e.g., Carter et al. 1996). To control for such differences, we introduced a dummy variable with value 1 to denote female entrepreneurs and value 0 for male entrepreneurs.

In additional analyses of the robustness of our findings, we assessed the impact of the business plan competition on the strategic orientation dimensions. The respective variable measures the intensity based on the number of competition events attended by nascent entrepreneurs. Table 2 provides descriptive statistics and correlations for dependent, independent, and control variables. Additionally, to measure the level of multicollinearity between all constitutive variables, we computed variance inflation factors (VIF), and we report them in Table 2. Our VIF values are less than 3.31, below the generally accepted threshold of 10 (Kutner et al. 2004).

3.3 Methods

We investigated the relationship between the venturing conditions and the strategic orientations based on hierarchical regression analysis (Agresti and Finlay 2009). We calculated two regression models in which the two strategic orientations are the dependent variables while indicators of founder experience and environmental dynamism are explanatory variables (Table 3).

4 Findings

Our analyses provide evidence regarding the detailed effects of pre-entry work experience along various dimensions and the perceived environmental dynamism on two core strategic orientations: the prediction orientation and the risk orientation.

We find that pre-entry work experience in large firms has a marginally negative impact (− 0.023) on the prediction orientation ($p < 0.1$), while the effect of work experience in small firms is not significant with regard to prediction orientation. Hence, our Hypothesis 1a is rejected.

Work experience in both large (− 0.068; $p < 0.01$) and small (− 0.048; $p < 0.05$) established firms decreases the orientation towards risk as downside loss but rather increases the focus on the upside potential. Hence, we find support for our Hypothesis 1b with regard to both established big firms and established small firms.

With regard to prior self-employment experience in new firms, we find that years of experience have a

Table 2 Correlation table for variables used for regression analysis

		Mean	Std. dev	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
1	Team founding	0.62	0.49	1														
2	Founder age	35.57	9.64	−0.308**														
3	Founder gender	0.32	0.47	−0.156*	0.078													
4	Technical venture	0.43	0.50	0.262**	−0.114	−0.311**												
5	Service	0.78	0.41	−0.175**	0.162*	0.067	−0.235**											
6	Degree of innovation	2.00	0.54	0.114	0.04	−0.118	0.313**	−0.160*										
7	Market innovativeness	0.27	0.45	0.05	−0.014	0.208**	−0.250**	−0.009	−0.157*									
8	Own financial resources	0.80	0.91	−0.016	−0.159*	−0.138*	0.035	0.058	0.093	−0.088								
9	Bank financial resources	0.23	0.72	−0.037	0.035	−0.038	−0.106	0.033	0.019	−0.018	0.231**							
10	Work experience small firms	5.69	6.92	−0.08	0.457**	0.029	−0.05	0.097	0.087	0.057	0.104	0.037						
11	Work experience large firms	4.40	6.66	−0.158*	0.516**	−0.046	−0.107	0.121	0.004	−0.034	0.130*	−0.033	−0.113					
12	Founding experience (years)	1.65	4.88	0.032	0.291**	−0.162*	0.014	0.008	0.073	0.031	0.115	0.081	0.414**	0.008				
13	Founding experience (firms)	0.17	0.38	0.09	0.219**	−0.239**	0.001	0.03	0.057	−0.008	0.182**	0.05	0.380**	0.009	0.539**			
14	Market dynamism	3.56	1.25	−0.018	−0.106	0.051	0.063	−0.058	−0.145*	−0.016	−0.101	0.01	−0.105	−0.079	−0.07	−0.129*		
15	Prediction orientation	3.05	0.85	0.061	0.026	0.049	0.025	−0.08	0.131*	−0.133*	0.019	0.12	0.078	−0.112	0.077	0.11	−0.170**	
16	Risk orientation	3.52	1.08	−0.05	−0.104	0.102	−0.049	0.006	−0.107	−0.029	0.019	−0.072	−0.055	−0.069	−0.035	−0.112	0.321**	−0.257**

*Correlation is significant at the 0.05 level

**Correlation is significant at the 0.01 level

Table 3 Results of hierarchical regression analysis

	Prediction orientation				Risk orientation			
	Model 1		Model 2		Model 3		Model 4	
	Control only	VIF	Full model	VIF	Control only	VIF	Full model	VIF
Technical venture	− 0.073	1.297	− 0.037	1.375	0.203	1.297	0.041	1.375
Service team founding	− 0.182	1.438	− 0.187	1.561	0.306	1.438	0.523*	1.561
	0.178	1.296	0.154	1.325	− 0.081	1.296	0.214	1.325
Founder age	0.005	1.089	0.010	2.747	− 0.022^{+}	1.089	0.022	2.747
Founder gender	0.212	1.289	0.266^{+}	1.562	0.413	1.289	0.239	1.562
Own financial capital	− 0.021	1.212	− 0.046	1.389	− 0.115	1.212	0.015	1.389
Bank financial capital	0.173^{+}	1.180	0.178*	1.306	− 0.037	1.180	− 0.023	1.306
Innovativeness degree	0.200	1.297	0.136	1.600	0.158	1.297	0.229	1.600
Market-related innovativeness	− 0.338^{+}	1.146	− 0.376*	1.311	− 0.187	1.146	− 0.110	1.311
Employed work experience (small firms)			− 0.005	2.474			− 0.048*	2.474
Employed work experience (large firms)			− 0.023^{+}	2.136			− 0.068**	2.136
Self-employed experience (years)			− 0.008	2.071			0.054^{+}	2.071
Self-employed experience (no. of ventures started)			0.110^{+}	2.351			− 0.720*	2.351
Perceived environmental dynamism			− 0.175**	1.468			0.205^{+}	1.468
Overall regression values								
R^2	0.065		0.125		0.155		0.377	
Adjusted R^2	0.029		0.072		0.032		0.223	
F-statistic	1.828		2.378		1.260		2.459	
Significance	0.064		0.004		0.277		0.009	

$^{+}$ Significant at the 0.10 level

*Significant at the 0.05 level

**Significant at the 0.01 level

negative, non-significant impact on prediction orientation, yet the number of started ventures has a positive effect on prediction orientation although only marginally significant (0.110; $p < 0.1$). Thus, we do not find support for Hypotheses 2a and 3a.

The risk orientation as downside loss is increased by nascent entrepreneurs' prior years of founding experience, however only marginally (0.054; $p < 0.1$). In contrast, the risk orientation as focus on downside loss is decreased and, hence, the focus on the upside potential is increased by number of started ventures (− 0.720; $p < 0.05$). Hence, hypothesis Hypotheses 2b is not supported, while Hypothesis 3b is supported.

Turning to the effects of environmental dynamism, we find that environmental dynamism decreases the nascent entrepreneurs' prediction orientation (0.175; $p < 0.01$) in line with our prediction. The effect of the perceived environmental dynamism on risk orientation is only marginally significant and positive (0.205; $p < 0.1$). Thus, Hypothesis 4a is supported, while Hypothesis 4b is rejected. Table 4 provides an overview of our findings regarding the various hypotheses.

4.1 Discussion

Despite general agreement that the way in which entrepreneurs approach uncertainty is crucial for the development of their new venture, insights into decision-making of individuals in the earliest stages of the company creation process remain limited. More specifically, while extant research focused on emphasizing the differences between decision-making of novice and experienced entrepreneurs, we examine antecedents of prediction and risk orientations as two core strategic

Table 4 Overview of accepted/rejected hypotheses

Hypothesis	Content of the hypothesis	Outcome
H1a +	Prior work experience in both small and large established firms increases a nascent entrepreneur's focus on prediction orientation.	Not supported
H1b −	Prior work experience in both small and large established firms increases a nascent entrepreneur's focus on the upside opportunity rather than downside loss.	Supported
H2a −	Prior work experience in form of the amount of time spent in new firms decreases a nascent entrepreneur's prediction orientation.	Not supported
H2b +	Prior work experience in form of the amount of time spent in a new firm increases a nascent entrepreneur's focus on the downside loss rather than as upside opportunity.	Not supported
H3a +	Prior work experience in form of number of newly started ventures increases a nascent entrepreneur's prediction orientation.	Not supported
H3b −	Prior work experience in form of number of newly started ventures increases a nascent entrepreneur's focus on the upside opportunity rather than downside loss	Supported
H4a −	Perceived environmental dynamism decreases a nascent entrepreneur's prediction orientation.	Supported
H4b +	Perceived environmental dynamism increases a nascent entrepreneur's focus on the downside loss instead of upside opportunity.	Not supported

orientations. We develop a model on how work experience in established small and larger firms, different dimensions capturing prior startup experience, as well as the perceived environmental dynamism affect the prediction and risk orientations of nascent entrepreneurs. Our findings have important implications for research on decision-making and strategy in emergent organizations as we find that the origins of the initial strategic orientations of founders can be traced back to the founders' individual prior work experiences and perceptions of the new firm's environment.

4.2 Theoretical implications

The basic premise of this paper is that as individuals engage in the pursuit of entrepreneurial opportunities, their decision-making is influenced by their strategic orientations towards risk and prediction. Building on human capital theorizing, we examined the role of various experience dimensions and perceived environmental dynamism on two salient strategic orientations of the nascent entrepreneurs.

Recent literature advocates the key role of the nascent entrepreneurs in the strategy formation process and highlights how the individual characteristics and cognitive processes impact entrepreneurs' strategy-making (e.g., Foss et al. 2008; Haynie et al. 2010; Mitchell et al. 2008). Especially, the entrepreneurship domain provides a fertile ground for research since much of the progress of a new ventures hinges on the enterprising individuals and their nexus with the environment (Shane 2003). This stream of literature finds that under conditions of uncertainty and limited resources, which characterize the initial entrepreneurship setting, the individual entrepreneurs frequently avoid a formalized, prediction-based and predetermined approach that aims at maximizing their returns (Bhide 1994; Kisfalvi 2002; Wiltbank et al. 2006). Instead, entrepreneurial strategy frequently comes into existence by individual decisions, actions, and reactions of the founders which are in turn shaped by their cognitive frameworks, heuristics, and biases (Baron 2004; Shepherd and Krueger 2002; Sarasvathy 2001).

Our study revealed various novel insights contributing to literature. First, we discover that two central strategic orientations of nascent entrepreneurs (i.e., prediction orientation and risk orientation) are affected differently by the individual's prior work experience in established large and small firms, their work experience in new firms, and the perceived environmental dynamism. We find that the antecedents of the prediction orientation differ from antecedents of risk orientation. The prediction orientation is affected by the perceived environmental context, while the risk orientation is predominantly influenced by the nascent entrepreneurs' human capital characteristics (work experiences in established and new firms and the number of firms previously started). We did not find strong effects of work experience on prediction orientation and only marginal effects of the environmental dynamism perception on the risk orientation.

Our findings suggest that the prediction orientation may be situational. As the nascent entrepreneurs perceive the environment, they will adopt their planning style. The more dynamic and hence less predictable the environment appears, the less prediction efforts are undertaken. This finding complements the substantial research on the business planning phenomenon which suggests that individual factors affect the business planning approach (Brinckmann et al. forthcoming). Moreover, it adds to the discussion whether business planning is rather a response to institutional forces such as investor's requirements or a substantive approach to make sense of the environment and prepare for the future. Our finding suggests that nascent entrepreneurs indeed adjust their venture approach with regard to prediction to the perceived venture environment. While these individuals might still prepare formal business plans to satisfy external stake-holder requirements, their efforts may be well-adjusted with regard to the value they attribute for their personal insights. Much as the effectuation literature suggest that experienced nascent entrepreneurs might focus more on controlling an uncertain future rather than trying to predict it (Sarasvathy 2001). However, in contrast to effectuation literature propositions, we do not find evidence that the background of the individuals influences their orientation towards predicting the environment vs. controlling it. To the contrary, we see marginal effects that individuals who started various ventures previously appear to be more prediction-oriented while strikingly individuals with more extensive experience in large firms appear less prediction-oriented. While these effects are only marginal, they raise interesting questions, regarding the perceptions individuals develop regarding phenomena, such as prediction or planning vs. more control or action-oriented approaches as they gain work experience. It appears that in this respect, more cognitive research is needed to determine resulting learnings and subsequent perceptions and orientations.

With regard to the risk dimension, our findings provide some novel insights. Adding to prominent research on business opportunity evaluation (Baron and Ensley 2006), we find that nascent entrepreneurs that have multiple prior founding experiences focus on the upside potential rather than on the risk of downside loss. If we, however, consider only prior tenure in startups, the effect is the opposite though only marginally significant. Following our theorizing, we believe that serial and portfolio entrepreneurs can hedge individual venture risks and hence with respect to a single venture can focus more on the upside potential. Meanwhile, prior entrepreneurs that worked a longer time in a single startup might be aware of the struggle and risks involved in launching a new venture and hence consider more the downside risk as they start out again. Noteworthy, nascent entrepreneurs with prior experience in established businesses, both small and large, tend to focus more on the upside potential than the downside risk. Following human capital theorizing, this could be caused by their higher opportunity costs. Yet, it could also indicate that they are not aware (yet) of the substantial risks in starting an own venture and hence rather see the upside potential. The upside potential orientation likely also contributed to their decision to leave the established firm and start their own venture in the first place. Hence, our finding indicates substantial potential concerns about cognitive biases of specific types of founders that lack prior startup experience who overestimate the upside potential while not being aware of the risks of launching a new venture. Considering that the different specific prior experiences point to opposing effects regarding the downside risk and upside potential orientation, it appears that the learning and perceptions resulting from prior work experience are diverse and context-dependent. Strikingly, the perceived environmental dynamism is affecting the downside risk vs upside potential orientation only marginally. As one might expect, an environment that is perceived as more dynamic leads the individuals to focus more on the downside risk. Given that the effect is only marginally significant, it might be that other cognitive dynamics are occurring. For instance, a dynamic market context might cause the nascent entrepreneurs to perceive more and greater opportunities which could sway them towards an upside potential orientation which somewhat counteracts the downside risk perception attributed to dynamic environments. Overall, we find evidence that strategic orientations of the nascent entrepreneurs might develop in a differentiated, multi-faceted, and rather complex way. Studying these phenomena is fertile as much of the later firm strategy results from the early and developing strategic orientations of the individuals heading the firms.

4.3 Managerial implications

From a practitioner perspective, our study suggests that a new view on strategic orientation for nascent entrepreneurship is beneficial. To date, strategy development is frequently considered a concern of managers in

established and large organizations. Our research shows that strategy plays a prominent role for decisions and actions that impact the trajectory of the emerging organization. Entrepreneurs should be aware that their thinking is influenced by their own strategic orientations that in turn are shaped by their prior experience and the perception of the environment. Our research seeks to inspire entrepreneurs to consider the relevancy and adequacy of their strategic orientations towards prediction and risk consciously. A more reflective approach towards one's own background and the innately subjective perception of the environment likely shape key strategic orientations both consciously and unconsciously. We suggest to evaluate the own central strategic orientations more actively through personal reflection and especially interaction with cofounders, peers, partners, and mentors. Substantial complementary research indicates that individual cognition can be prone to various cognitive biases including the ones discussed in this research. Understanding the relationships between these biases and subsequent action as well as resulting performance outcomes could help reduce and/or avoid some likely adverse effects.

4.4 Limitations and outlook

Our research has some limitations. First, our study focuses on the antecedents of strategic orientations of individual nascent entrepreneurs who act either as single entrepreneurs or founding team members. Hence, there is a possibility in team configurations that the team interaction and team processes influence the individual's strategic orientations and in consequence have confounding effects on the results of our study. However, we expect that team-based effects influence our findings only marginally given that we explicitly control for whether the founding is team-based and also checked the robustness of our findings in additional calculations which included a variable capturing the number of the founding team members. These different control variables had no significant effect on our results. Second, we drew our sample from participants of four major German business plan competitions. Hence, such selection and self-selection criteria may lead to a selection bias, e.g., towards individuals with preference for prediction or business planning. However, as argued by Grichnik et al. (2014), sampling from prominent business plan competitions in Europe offers a valid sampling approach although one that is not representative to the whole population of nascent entrepreneurs, but may cause a self-selection towards more ambitious and growth-oriented entrepreneurs. Third, a further limitation arises from the development of the strategic orientation measures. We applied commonly used Likert scales to measure the nascent entrepreneur's strategic orientations as a tradeoff between two strategic extremes (e.g., Brettel et al. 2012). As an alternative, one could measure the intensity towards one extreme on two independent scales and assess the degree to which the respondent agrees to each of the two separate dimensions (Chandler et al. 2011). Future research can compare the validity and effectiveness of these two different measurement approaches. Moreover, our study focused on identifying the antecedents of the strategic orientations while leaving aside the effects those individual-level strategic orientations have, e.g., on team decision-making or subsequent actions. Thus, a study examining such relationships, e.g., connecting individual-level strategic orientations and early-stage venture performance outcomes, is needed. We also like to underline that we analyzed intended strategic orientations which likely will diverge from realized strategies (Miles and Snow 1978). We further specifically acknowledge that a cross-country comparison of strategic orientations of nascent entrepreneurs is an important issue for future research.

Hence, our study points to various promising future research streams. Future research could detail the understanding of strategy formation of nascent entrepreneurs by focusing more explicitly on the entrepreneurs' decision-making process. Extant research exemplifies that there are differences in how experienced and novice entrepreneurs make decisions (Gustafsson 2006). Research looking at stability and change (e.g., when and how) of individual-level strategic orientations over time appears an attractive avenue for further research. Second, since entrepreneurship is simultaneously a phenomenon of the individual entrepreneur and a process of social interaction, a better understanding of these subjective and inter-subjective effects in the strategy domain appears fruitful. More specifically, a detailed understanding of how the individual orientations influence strategy making in team-founded new ventures appears promising. Thus, we hope that our study of antecedents on individual-level strategic orientation and its antecedents will inspire more research to contribute to our understanding of these micro-foundations of firm strategy-making as new firms come into existence and develop.

References

Agresti, A., & Finlay, B. (2009). *Statistical methods for the social sciences*. Upper Saddle River: Pearson Prentice Hall.

Alvarez, S. A., & Barney, J. B. (2007). Discovery and creation: alternative theories of entrepreneurial action. *Strategic Entrepreneurship Journal, 1*(1–2), 11–26. https://doi.org/10.1002/sej.4.

Ardichvili, A., Cardozo, R., & Ray, S. (2003). A theory of entrepreneurial opportunity identification and development. *Journal of Business Venturing, 18*(1), 105–123. https://doi.org/10.1016/S0883-9026(01)00068-4.

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.

Baron, R. A. (2004). The cognitive perspective: a valuable tool for answering entrepreneurship's basic "why" questions. *Journal of Business Venturing, 19*(2), 221–239.

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.

Becker, G. S. (1975). *Human capital*. Chicago: Chicago University Press.

Begley, T. M., & Boyd, D. P. (1987). Psychological characteristics of associated with performance in entrepreneurial firms and small businesses. *Journal of Business Venturing, 2*(1), 79–83.

Bhide, A. (1994). How entrepreneurs craft strategies that work. *Harvard Business Review, 72*(2), 150–162.

Brehmer B. 1987. The psychology of risk. In Risk and decisions. In Risk and decision, Singleton WT, Hovden J (eds). John Wiley: New York; 25–39.

Brettel, M., Mauer, R., Engelen, A., & Küpper, D. (2012). Corporate effectuation: entrepreneurial action and its impact on R&D project performance. *Journal of Business Venturing, 27*(2), 167–184. https://doi.org/10.1016/j.jbusvent.2011.01.001.

Brinckmann, J., Grichnik, D., & Kapsa, D. (2010). Should entrepreneurs plan or just storm the castle? A meta-analysis on contextual factors impacting the business planning–performance relationship in small firms. *Journal of Business Venturing, 25*(1), 24–40. https://doi.org/10.1016/j.jbusvent.2008.10.007.

Brinckmann, J., Salomo, S., & Gemuenden, H. G. (2011). Financial management competence of founding teams and growth of new technology-based firms. *Entrepreneurship Theory and Practice, 35*(2), 217–243. https://doi.org/10.1111/j.1540-6520.2009.00362.x.

Brown, S., & Warner, J. (1985). Using daily stock returns: the case of events studies. *Journal of Financial Economics, 14*(1), 3–31. https://doi.org/10.1016/0304-405X(85)90042-X.

Busenitz, L. W., & Arthurs, J. D. (2007). Cognition and capabilities in entrepreneurial ventures. In J. R. Baum, M. Frese, & R. Baron (Eds.), *The psychology of entrepreneurship* (pp. 131–150). Mahwah: Lawrence Erlbaum Associates.

Busenitz, L. W., & Barney, J. W. (1997). Differences between entrepreneurs and managers in large organizations: biases and heuristics in strategic decision-making. *Journal of Business Venturing, 12*(6), 9–30.

Carroll, G., & Mosakowski, E. (1987). The career dynamics of self-employment. *Administrative Science Quarterly, 32*(4), 570–589.

Carter, N. M., Gartner, W. B., & Reynolds, P. D. (1996). Exploring start-up event sequences. *Journal of Business Venturing, 11*(3), 151–166.

Cassar, G., & Craig, J. B. (2009). An investigation of hindsight bias in nascent venture activity. *Journal of Business Venturing, 24*(2), 149–164. https://doi.org/10.1016/j.jbusvent.2008.02.003.

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.

Chandler, G. N., & Lyon, D. W. (2001). Issues of research design and construct measurement in entrepreneurship research: the past decade. *Entrepreneurship Theory and Practice, 26*(4), 101–113.

Chen, C. C., Greene, P. G., & Crick, A. (1998). Does self-efficacy distinguish entrepreneurs from managers? *Journal of Business Venturing, 13*(4), 295–316.

Cooper, A. C., Folta, T. B., & Woo, C. (1995). Entrepreneurial information search. *Journal of Business Venturing, 10*(2), 107–120.

Davidsson, P. (2006). Nascent entrepreneurship: empirical studies and developments. *Foundations and trends® in entrepreneurship, 2*(1), 1–76. https://doi.org/10.1561/0300000005.

Davis, J. P., Eisenhardt, K. M., & Bingham, C. B. (2009). Optimal structure, market dynamism, and the strategy of simple rules. *Administrative Science Quarterly, 54*(3), 413–452.

Delmar, F., & Davidsson, P. (2000). Where do they come from? Prevalence and characteristics of nascent entrepreneurs. *Entrepreneurship & Regional Development, 12*(1), 1–23. https://doi.org/10.1080/089856200283063.

Delmar, F., & Shane, S. (2003). Does business planning facilitate the development of new ventures? *Strategic Management Journal, 24*(12), 1165–1185.

Dencker, J. C., Gruber, M., & Shah, S. K. (2009). Pre-entry knowledge, learning, and the survival of new firms. *Organization Science, 20*(3), 516–537.

Dew, N., Read, S., Sarasvathy, S. D., & Wiltbank, R. (2008). Outlines of a behavioral theory of the entrepreneurial firm. *Journal of Economic Behavior & Organization, 66*, 37–59.

Dew, N., Read, S., Sarasvathy, S. D., & Wiltbank, R. (2009). Effectual versus predictive logics in entrepreneurial decision-making: differences between experts and novices. *Journal of Business Venturing, 24*(4), 287–309. https://doi.org/10.1016/j.jbusvent.2008.02.002.

Dew, N., Read, S., Sarasvathy, S. D., & Wiltbank, R. (2015). Entrepreneurial expertise and the use of control. *Journal of Business Venturing Insights, 4*(Supplement C), 30–37. https://doi.org/10.1016/j.jbvi.2015.09.001

Dillman, D. A. (2007). *Mail and internet surveys: the tailored design method*. Hoboken: John Wiley & Sons, Inc..

Eisenhardt, K. M. (1989). Making fast strategic decision making in high-velocity environments. *Academy of Management Journal, 32*(3), 543–576.

Fiet, J. O., Clouse, V. G. H., & Norton Jr., W. I. (2004). Systematic search by repeat entrepreneurs. In J. E. Butler (Ed.), *Opportunity identification and entrepreneurial behavior* (pp. 1–28). Greenwich: Information Age Publishing.

Forlani, D., & Mullins, J. W. (2000). Perceived risk and choices in entrepreneurs' new venture decisions. *Journal of Business Venturing, 15*(4), 305–322.

Foss, K., Foss, N., & Klein, P. (2007). Original and derived judgment: an entrepreneurial theory of economic organization. *Organization Studies, 28*(12), 1893–1912. https://doi.org/10.1177/0170840606076179.

Foss, N. J., Klein, P. G., Kor, Y. Y., & Mahoney, J. T. (2008). Entrepreneurship, subjectivism, and the resource-based view: toward a new synthesis. *Strategic Entrepreneurship Journal, 2*(1), 73–94.

Fredrickson, J. W., & Iaquinto, A. L. (1989). Inertia and creeping rationality in strategic decision processes. *Academy of Management Journal, 32*(3), 516–542.

Fredrickson, J. W., & Mitchell, T. R. (1984). Strategic decision processes: comprehensiveness and performance in an industry with an unstable environment. *Academy of Management Journal, 27*(2), 399–423.

Gimeno, J., Folta, T., Cooper, A., & Woo, C. (1997). Survival of the fittest? Entrepreneurial human capital and the persistence of underperforming firms. *Administrative Science Quarterly, 42*(4), 750–783.

Grant, R. M. (2003). Strategic planning in a turbulent environment: evidence from the oil majors. *Strategic Management Journal, 24*(6), 491–517.

Grichnik, D., Brinckmann, J., Singh, L., & Manigart, S. (2014). Beyond environmental scarcity: human and social capital as driving forces of bootstrapping activities. *Journal of Business Venturing, 29*(2), 310–326. https://doi.org/10.1016/j.jbusvent.2013.02.006.

Gruber, M. (2007). Uncovering the value of planning in new venture creation: a process and contingency perspective. *Journal of Business Venturing, 22*(6), 782–807.

Gustafsson, V. (2006). *Entrepreneurial decision-making: individuals, tasks and cognitions*. Northamton, MA and Cheltjam: Edward Elgar Publishing Limited.

Hauser, J., Tellis, G. J., & Griffin, A. (2006). Research on innovation: a review and agenda for marketing. *Marketing Science, 25*(6), 687–717. https://doi.org/10.1287/mksc.1050.0144.

Haynie, J. M., Shepherd, D., Mosakowski, E., & Earley, P. C. (2010). A situated metacognitive model of the entrepreneurial mindset. *Journal of Business Venturing, 25*(2), 217–229.

Hayton, J. C., Allen, D. G., & Scarpello, V. (2004). Factor retention decisions in exploratory factor analysis: a tutorial on parallel analysis. *Organizational Research Methods, 7*(2), 191–205.

Heath, C., & Tversky, A. (1991). Preference and belief: ambiguity and competence in choice under uncertainty. *Journal of Risk and Uncertainty, 4*(1), 5–28. https://doi.org/10.1007/BF00057884.

Henderson, A. D., & Stern, I. (2004). Selection-based learning: the coevolution of internal and external selection in high-velocity environments. *Administrative Science Quarterly, 49*(1), 39–75.

Honig, B., & Karlsson, T. (2004). Institutional forces and the written business plan. *Journal of Management, 30*(1), 29–48. https://doi.org/10.1016/j.jm.2002.11.002.

Horn, J. L. (1965). A rationale and test for the number of factors in factor analysis. *Psychometrika, 30*(2), 179–185.

Hough, J. R., & White, M. A. (2003). Environmental dynamism and strategic decision making rationality: an examination at the decision level. *Strategic Management Journal, 24*(5), 481–489.

Huff, J., Huff, A. S., & Thomas, H. (1992). Strategic renewal and the interaction of cumulative stress and inertia. *Strategic Management Journal, 13*(S1), 55–75. https://doi.org/10.1002/smj.4250131006.

Ireland, R. D., Hitt, M. A., & Sirmon, D. G. (2003). A model of strategic entrepreneurship: the construct and its dimensions. *Journal of Management, 29*(6), 963–989. https://doi.org/10.1016/S0149-2063(03)00086-2.

Janney, J., & Dess, G. (2006). The risk concept for entrepreneurs reconsidered: new challenges to the conventional wisdom. *Journal of Business Venturing, 21*, 385–400.

Johnson, M., & Lakoff, G. (2002). Why cognitive linguistics requires embodied realism. *Cognitive Linguistics, 13*(3), 245–263. https://doi.org/10.1515/cogl.2002.016.

Kahneman, D. (2011). *Thinking, fast and slow*. London: Allen Lane.

KfW-Bankengruppe. (2007). In K. Kohn & H. Sprengler (Eds.), *KfW-Gründungsmonitor 2007* (pp. 1–113). Frankfurt am Main, Germany: KfW Bankengruppe.

Kirsch, D., Goldfarb, B., & Gera, A. (2009). Form or substance: the role of business plans in venture capital decision making. *Strategic Management Journal, 30*(5), 487–515.

Kisfalvi, V. (2002). The entrepreneur's character, life issues, and strategy making: a field study. *Journal of Business Venturing, 17*(5), 489–518.

Krueger, N., & Dickson, P. (1994). How believing in ourselves increases risk taking. *Decision Sciences, 25*(3), 385–400 10.1111/j.1540-5915.1994.tb00810.x.

Kutner, M., Nachtsheim, C., & Neter, J. (2004). *Applied linear regression models*. Boston, MA: McGraw-Hill/Irwin.

Lumpkin, T., & Dess, G. (1996). Clarifying the entrepreneurial orientation construct and linking it to performance. *Academy of Management Review, 21,* 135–172.

March, J. G., & Shapira, Z. (1987). Managerial perspectives on risk and risk taking. *Management Science, 33*(11), 1404–1418.

Mayer-Haug, K., Read, S., Brinckmann, J., Dew, N., & Grichnik, D. (2013). Entrepreneurial talent and venture performance: a meta-analytic investigation of SMEs. *Research Policy, 42*(6–7), 1251–1273. https://doi.org/10.1016/j.respol.2013.03.001.

McGee, J. E., Peterson, M., Mueller, S. L., & Sequeira, J. M. (2009). Entrepreneurial self-efficacy: refining the measure and examining its relationship to attitudes toward venturing and nascent entrepreneurship. *Entrepreneurship Theory and Practice, 33*(4), 965–988. https://doi.org/10.1111/j.1540-6520.2009.00304.x.

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.

Miles, R. E., & Snow, C. C. (1978). *Organizational strategy, structure, and process*. New York: McGraw-Hill Book Co..

Miller, D., & Dröge, C. (1986). Psychological and traditional determinants of structure. *Administrative Science Quarterly, 31*(4), 539–560. https://doi.org/10.2307/2392963.

Miller, D., & Friesen, P. (1984). A longitudinal study of the corporate life cycle. *Management Science, 30*(10), 1161–1183.

Milliken, F. J. (1987). Three types of perceived uncertainty about the environment: state, effect and response uncertainty. *Academy of Management Review, 12*(1), 133–143.

Mintzberg, H., & Waters, J. A. (1985). Of strategies, deliberate and emergent. *Strategic Management Journal, 6*(3), 257–272. https://doi.org/10.1002/smj.4250060306.

Mitchell, R. K., Mitchell, J. R., & Smith, J. B. (2008). Inside opportunity formation: enterprise failure, cognition, and the creation of opportunities. *Strategic Entrepreneurship Journal, 2*(3), 225–242.

Mullins, J., & 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.

Nicholls-Nixon, C. L., Cooper, A. C., & Woo, C. Y. (2000). Strategic experimentation: understanding change and performance in new ventures. *Journal of Business Venturing, 15*(5), 493–521.

Nunnally, J. C. (1978). *Psychometric theory*. New York: McGraw-Hill.

Parker, S. C., & Belghitar, Y. (2006). What happens to nascent entrepreneurs? An econometric analysis of the PSED. *Journal Small Business Economics, 27*(1), 81–101 10.1007/s11187-006-9003-4.

Priem, R. L., Rasheed, A. M. A., & Kotulic, A. G. (1995). Rationality in strategic decision process, environmental dynamism and firm performance. *Journal of Management, 21*(5), 913–929.

Read, N., & Sarasvathy, S. D. (2005). Knowing what to do and doing what you know: effectuation as a form of entrepreneurial expertise. *Journal of Private Equity, 9*(1), 45–62.

Reynolds PD, Curtin RT. 2008. Business creation in the United States: panel study of entrepreneurial dynamics II initial assessment. Foundations and trends® in entrepreneurship 4(3): 155–307. 10.1561/0300000022.

Rosenbusch, N., Brinckmann, J., & Bausch, A. (2011). Is innovation always beneficial? A meta-analysis of the relationship between innovation and performance in SMEs. *Journal of Business Venturing, 26*(4), 441–457. https://doi.org/10.1016/j.jbusvent.2009.12.002.

Sarasvathy, S. D. (2001). Causation and effectuation: towards a theoretical shift from economic inevitability to entrepreneurial contingency. *Academy of Management Review, 26*(2), 243–263.

Sarasvathy, S. D. (2008). *Effectuation: elements of entrepreneurial expertise*. Northampton: Edward Elgar Publishing Ltd.

Sarasvathy, S. D., & Dew, N. (2005). New market creation through transformation. *Journal of Evolutionary Economics, 15*(5), 533–565. https://doi.org/10.1007/s00191-005-0264-x.

Sarasvathy, S. D., Simon, H., & Lave, L. (1998). Perceiving and managing business risks: differences between entrepreneurs and bankers. *Journal of Economic Behavior and Organization, 33*(2), 207–225. https://doi.org/10.1016/S0167-4870(02)00203-9.

Scholer, A. A., Zou, X., Fujita, K., Stroessner, S. J., & Higgins, E. T. (2010). When risk seeking becomes a motivational necessity. *Journal of Personality and Social Psychology, 99*(2), 215–231. https://doi.org/10.1037/a0019715

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. A. (2003). *A general theory of entrepreneurship: the individual-opportunity nexus*. Northampton: Edward Elgar Publishing.

Shepherd, D. A., & DeTienne, D. R. (2005). Prior knowledge, potential financial reward, and opportunity identification. *Entrepreneurship Theory and Practice, 29*(1), 91–112.

Shepherd, D. A., & Krueger, N. F. (2002). An intentions-based model of entrepreneurial teams' social cognition. *Entrepreneurship Theory and Practice, 27*(2), 167–185.

Shrader, R., & Siegel, D. S. (2007). Assessing the relationship between human capital and firm performance: evidence from technology-based new ventures. *Entrepreneurship Theory and Practice, 31*(6), 893–908. https://doi.org/10.1111/j.1540-6520.2007.00206.x.

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.

Stevenson, H. H., & Gumpert, D. (1985). The heart of entrepreneurship. *Harvard Business Review, 63*(2), 85–94.

Starbuck, W. H., & Mezias, J. M. (1996). Opening Pandora's box: studying the accuracy of managers' perceptions. *Journal of Organizational Behavior, 17*(2), 99–117. https://doi.org/10.1002/(SICI)1099-1379.

Stone, M. M., & Brush, C. G. (1996). Planning in ambiguous contexts: the dilemma of meeting needs for commitment and demands for legitimacy. *Strategic Management Journal, 17*(8), 633–652.

Unger, J. M., Keith, N., Hilling, C., Gielnik, M. M., & Frese, M. (2009). Deliberate practice among South African small business owners: relationships with education, cognitive ability, knowledge, and success. *Journal of Occupational and Organizational Psychology, 82*(1), 21–44.

Upton, N., Teal, E. J., & Felan, J. T. (2001). Strategic and business planning practices of fast growth family firms. *Journal of Small Business Management, 39*(1), 60–72. https://doi.org/10.1111/0447-2778.00006.

Ucbasaran, D., Wright, M., & Westhead, P. (2003). A longitudinal study of habitual entrepreneurs: starters and acquirers. *Entrepreneurship & Regional Development, 15*(3), 207–228.

Uygur, U., & Kim, S. M. 2014. Evolution of entrepreneurial judgment. Effects of experience, uncertainty, and cognition Advancing European entrepreneurship research: entrepreneurship as a working attitude, a mode of thinking and an everyday practice. (pp. 221–250): Information Age Publishing.

Wagner, J. (2007). Nascent Entrepreneurs. In S. Parker (Ed.), The Life Cycle of Entrepreneurial Ventures (pp. 15–37). Boston, MA: Springer US.

Weiner, B. (1985). An attribution theory of achievement motivation and emotion. *Psychological Review, 92*(4), 548–573. https://doi.org/10.1037/0033-295X.92.4.548.

Welter, C., & Kim, S. (2018). Effectuation under risk and uncertainty: a simulation model. *Journal of Business Venturing, 33*(1), 100–116. https://doi.org/10.1016/j.jbusvent.2017.11.005.

Wiklund, J., & Shepherd, D. A. (2008). Portfolio entrepreneurship: habitual and novice founders, new entry, and mode of organizing. *Entrepreneurship Theory and Practice, 32*(4), 701–725.

Wiltbank, R., Dew, N., Read, S., & Sarasvathy, S. D. (2006). What to do next? The case for non-predictive strategy. *Strategic Management Journal, 27*(10), 981–998.

Wiltbank, R., Read, S., Dew, N., & Sarasvathy, S. D. (2009). Prediction and control under uncertainty: outcomes in angel investing. *Journal of Business Venturing, 24*(2), 116–133 10.1016/j.jbusvent.2008.02.002.

Zhao, H., Seibert, S., & Hills, G. (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.

Zwick, W. R., & Velicer, W. F. (1982). Factors influencing four rules for determining the number of components to retain. *Multivariate Behavioral Research, 17*(2), 253–269.