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THE ROLE OF ACTION-CONTROL BELIEFS IN DEVELOPING ENTREPRENEURIAL EXPERTISE

ABSTRACT

Purpose—This paper theorizes on the mechanisms underlying the development of entrepreneurial expertise. While prior studies have identified differences between the behaviour of novice and expert entrepreneurs, the mechanisms that cause these differences have not received sufficient attention.

Design/methodology/approach—This paper systematically reviews the extant literature on entrepreneurial expertise and builds the conceptual framework by employing an action-control belief framework to propose mechanisms underlying the development of expert behaviour.

Findings—This paper argues that differences in behaviour between novice and expert entrepreneurs stem from self-perceptions of their ability to act. More specifically, stronger action-control beliefs encourage entrepreneurs to create new interpretations of the world over time; develop and use strategies that allow them to rely on perceived control over means and ends, their perceived capacity, and their agency; and hence behave more like experts.

Practical implications—This paper suggests that strategy, capacity, and control beliefs are key in individuals' decisions of whether to engage in entrepreneurial action and that expert entrepreneurs hold stronger beliefs than novices. Positive experiences, particularly those associated with deliberate practice, contribute to developing these beliefs and, more broadly, to entrepreneurial expertise.

Originality/value—This paper proposes that the mechanism of transformation from novice to expert behaviour can be attributed to positive changes in deeply held beliefs about strategy, capacity, and control. Each of the beliefs can develop separately from others and at different pace. In other words, this work explains why novice and expert entrepreneurs behave differently.

INTRODUCTION

Understanding how to develop entrepreneurial expertise is central to achieving entrepreneurial success. Entrepreneurial expertise—defined as the superior ability to perform entrepreneurial tasks—is highly contextual (Ericsson *et al.*, 2006) and is reflected in behavioural differences between experts and novices (Dew *et al.*, 2009, 2015; Gustafsson, 2006). For example, research has shown that expert entrepreneurs rely predominately on control-based logic (e.g., effectuation) (Dew *et al.*, 2009, 2015; Read and Sarasvathy, 2005), adapt how they make decisions to the nature of the task (Gustafsson, 2006), and remain flexible when unexpected contingencies arise (Sarasvathy, 2008). Researchers have attempted to explain these differences in behaviour, investigating the role of experience and deliberate practice (Baron and Henry, 2010; D'Souza and Kemelgor, 2009; Unger *et al.*, 2009),

knowledge structures (Mitchell *et al.*, 2002; Uygur and Kim, 2014), and expert scripts (Mitchell *et al.*, 2017). They have shown that experience alone is not a good predictor of expertise development (Ericsson and Lehmann, 1996; Toft-Kehler *et al.*, 2014) but that deliberate practice does facilitate such development (Ericsson *et al.*, 1993; Unger *et al.*, 2009). Additionally, Engel, Dimitrova, Khapova, and Elfring (2014) show that beliefs in one's own ability in general and entrepreneurial self-efficacy in particular also play an important role in expertise development.

Despite researchers' successful identification of factors responsible for differences in experts' and novices' behaviour, the mechanisms facilitating the emergence of these differences (e.g., expertise development) have not been explained sufficiently (Arend *et al.*, 2015). In other words, we still do not know *why* some individuals are able to become experts while others never achieve this competence level, and we still do not understand *how* the transformation from novice to expert entrepreneur occurs.

This conceptual paper builds on the extant literature on entrepreneurial expertise and deliberate practice and employs an action-control belief framework (cf. Skinner, 1995) to develop a theory about the mechanisms underlying the development of expert behaviour. The action-control framework posits that action-control beliefs (e.g., strategy [means-ends], capacity [agent-means], and control [agent-ends] beliefs) are the strong, deeply held assumptions about the relationship between means, ends, and agents that underpin individuals' understanding, decision making, and actions (Skinner, 1995). In other words, how individuals interpret situations depends on the breadth and strength of their strategy, capacity, and control beliefs. In the entrepreneurship context, developing action-control beliefs leads entrepreneurs to feel more creative and resourceful and grounds their decisions and actions on internal assessments of perceived feasibility (Engel *et al.*, 2014; Krueger, 1993). Additionally, by introducing deliberate practice as a moderator, the model proposes that individuals engaging in deliberate practice are able to change their action-control beliefs faster. Through this acquired new capacity, they are able to consolidate new information with existing knowledge, skills, and beliefs more effectively and hence improve decision making (Baron and Henry, 2010). Consequently, this paper develops an explanatory model describing how entrepreneurial expertise develops over time.

Providing insights into these mechanisms offers considerable potential for researchers to open the black box of entrepreneurial expertise development and identify possible dimensions of entrepreneurial expertise as well as to conceptualize the role of

“entrepreneurial” deliberate practice in this process. Additionally, the developed model has important implications for entrepreneurs and entrepreneurial education. Entrepreneurial tasks are complex—ranging from identifying an entrepreneurial opportunity and assessing its viability to acquiring necessary resources (including partnerships) and successfully turning the idea into a market offering (Haynie *et al.*, 2012; Trevelyan, 2011). To successfully complete these tasks requires various knowledge and skills. Understanding how action-control beliefs influence decisions about resource deployment in the entrepreneurship process and, more generally, what mechanisms are behind changing decision logic and behaviour could contribute significantly to designing educational systems and tools to help individuals develop these three beliefs (i.e., strategy, capacity, and control beliefs) and consequently develop entrepreneurial expertise.

This paper makes two primary contributions. First, it develops theory about the mechanisms underlying entrepreneurial expertise development and suggests that changing action-control beliefs leads to a transformation in behaviour from novice to expert. Action-control beliefs reflect entrepreneurs’ worldview (Krueger, 2007) and thus influence both their perceptions of their ability to engage in entrepreneurial action and their willingness to do so (Brundin and Gustafsson, 2013; McKelvie *et al.*, 2011). How entrepreneurs perceive their available means and their own ability to achieve desired actions plays an important role in determining what actions they believe are worth pursuing (Engel *et al.*, 2014; Krueger, 2003). Specifically, strategy beliefs influence individuals’ perceptions of an opportunity (i.e., what new activity can be imagined and realized); capacity beliefs influence individuals’ perceptions of how an opportunity can be realized (i.e., by what means) and thus their ability to realize the opportunity; and finally, control beliefs influence individuals’ willingness to engage in entrepreneurial action (and thus influence motivation) (Krueger, 1993). Second, while previous studies have identified deliberate practice as a factor in expertise development (Baron and Henry, 2010), this study suggests that deliberate practice moderates the relationship between action-control beliefs and entrepreneurial action. Entrepreneurs who engage in deliberate practice are likely to integrate new knowledge and skills into their current worldview better and faster and hence improve their performance. Simply put, engaging in deliberate practice reinforces entrepreneurs’ action-control beliefs and hence contributes to the development of expertise. Accordingly, this paper argues that the process of developing expertise requires positive changes to deeply held beliefs about access to means, possible means-ends frameworks, and perceived efficacy and that deliberate practice moderates the relationship between these changed beliefs and entrepreneurial action through

increased cognitive resources, thereby enhancing the development of entrepreneurial expertise.

This paper proceeds as follows: First, the concept of entrepreneurial expertise is introduced followed by a methodological approach section and conceptual model explaining the process and mechanisms behind expertise development. Next is the discussion of how action-control beliefs influence changes in behaviour over time. Then, the moderating role of deliberate practice is theorized followed by testable propositions to explain how behavioural transformation unfolds. The paper concludes by discussing the implications of these conceptualizations for theory and practice.

METHODOLOGICAL APPROACH TO BUILDING THE CONCEPTUAL FRAMEWORK

To build theory about the process of entrepreneurial expertise development, abductive logic was used to generate logical arguments (i.e., hypothetical explanations, or propositions) about how the process unfolds (Shepherd and Sutcliffe, 2011). Building the conceptual framework began with searches of the ProQuest and Social Science Citation Index (SSCI) databases using “entrepreneurial expertise development” and “entrepreneurial expertise” as keywords to identify suitable articles. The searches resulted in 100 and 223 articles, respectively. After filtering and checking for relevance, 46 articles remained; these were then coded depending whether entrepreneurial expertise was as input, output, or process. We read articles in which expertise was an output or process in detail and mapped them to reflect the current knowledge. The resulting picture highlighted that extant studies have focused on describing the essence of entrepreneurial expertise and identifying differences between novices and experts, leaving the process of expertise development greatly under scrutinized.

To address this gap, we started with the assumption that expertise reflects an acquired level of competence, and building on the recent findings regarding behavioural differences between novices and experts (Dew *et al.*, 2015; Engel *et al.*, 2014), we decided to explore the psychology literature for theories of control. The action-control beliefs framework (Chapman and Skinner, 1985; Skinner, 1995), although initially developed to evaluate the development of perceived control among children, was particularly suitable for our purpose for three reasons: First, perceived control is an important factor in explaining entrepreneurial expertise. Second, the framework is based on the action theoretical perspective, which assumes that individuals have intentional agency—an important factor in entrepreneurship (Chapman and

Skinner, 1985; Frese and Sabini, 1985). Finally, the framework assumes that perceived control reflects the fundamental need for competence, which is “an inborn desire to interact effectively with the environment” (Skinner, 1995, p. 8). Simply put, the action-control beliefs framework is useful in explaining how entrepreneurial expertise develops.

EXPERTISE DEVELOPMENT

Expertise—the superior ability to perform domain tasks—is highly contextual (Ericsson *et al.*, 2006) and is guided by a narrow set of domain-specific heuristics (Feltovich *et al.*, 2006). Expertise results from years of active and immersive experience (Baron and Henry, 2010) and depends on an individual’s acquisition of unique pattern-matching and pattern-recognition skills (Ericsson and Lehmann, 1996). Expertise translates into high levels of both declarative (i.e., knowing what) and procedural knowledge and skills (i.e., knowing how) as well as contextual flexibility (knowing when and where) (Dunphy and Williamson, 2004). Generally, research has shown that experts think more conceptually and holistically; are able to consider more possibilities; often employ reasoning through analogy; evaluate the usefulness of available information more critically and use key information more effectively; and approach, frame, and solve problems in a forward-oriented manner (Dane, 2010). Because experts’ knowledge is organized into higher-level and more interconnected concepts accompanied by a wider repertoire of actions and conditions, expertise provides greater flexibility in decision making and reflects a network of circumstantial “contexts of applicability” (Dunphy and Williamson, 2004).

Developing expertise takes time and effort. Research has found that it takes an average of 10 years to become an expert (Ericsson *et al.*, 2006). However, it has been shown that experience per se is not a good predictor of skill level and consequently expertise (Ericsson *et al.*, 2006). Extant research has asserted that deliberate practice facilitates this process (Ericsson and Lehmann, 1996). However, Macnamara, Hambrick, and Oswald (2014) challenge this claim by empirically showing that deliberate practice explains only a small portion of variance in performance and that its effect on performance decreases as the unpredictability of activities increases. Also, Ward, Hodges, Starkes, and Williams (2007) argue that “while deliberate practice may provide a vehicle for skill development, expertise is likely to arise as a result of an interaction between a number of related factors” (p.122). Motivation, the resulting sustained commitment to engage in an activity, as well as perceived competence are some of these factors (Ericsson *et al.*, 1993).

Deliberate practice and expertise development

Deliberate practice is a repetitive, intense, challenging, laborious, and not-inherently-enjoyable activity designed to improve key aspects of performance (Coughlan *et al.*, 2014). Engaging in deliberate practice requires one to maintain focused effort over long periods of time, set appropriate goals, engage in self-reflection and self-observation, and monitor results (Ericsson *et al.*, 1993). Experts engage in deliberate practice more often than non-experts and achieve better and longer-lasting results (Coughlan *et al.*, 2014). Simply put, by engaging more in deliberate practice, experts put more mental effort into improving their skills.

Engaging in deliberate practice increases domain knowledge and skills and enhances basic cognitive resources, such as perception, memory, metacognition, and intuition (Feltovich *et al.*, 2006). This enhanced cognitive capacity enables individuals to process new information more effectively as well as integrate that information with existing knowledge more easily (Baron and Henry, 2010). The main benefits of immersion in deliberate practice are better organization and more effective use of knowledge (Feltovich *et al.*, 2006). For example, while novices may identify the same environmental cues as experts, they are more likely to perceive them as separate signals, whereas experts are more likely to see them as part of an emerging pattern.

Knowledge structures and expertise development

Experts develop knowledge structures (i.e., scripts) that enable the effective organization of knowledge (Uygur and Kim, 2014). As such, expertise development is not necessarily related to substantial changes in knowledge content but rather in how knowledge is organized and how it is used. A script is knowledge organized into chunks that provide inferences (Mitchell, 1994). For example, having been exposed to similar situations in the past, individuals develop scripts containing emerging patterns of behaviour that allow them to limit the time they spend on planning and analyzing actions. Thus, novices are distinguished from experts by differences in organization and access to knowledge (Mitchell *et al.*, 2002). With experience, scripts tend to become larger and the information stored in them becomes more interrelated (Mitchell *et al.*, 2017). However, how knowledge is interpreted, personalized, and integrated into conceptual frameworks remains poorly understood (Eraut, 1988).

Extant research has asserted that beliefs play an important role in the process of organizing knowledge and in the emergence of causal maps and cognitive scripts (Bandura, 1997; Uygur and Kim, 2014). Beliefs contribute to changing knowledge structures by helping

make sense of new information given currently held beliefs and knowledge (Engel *et al.*, 2014).

ENTREPRENEURIAL EXPERTISE

Entrepreneurial expertise is specific to the context of entrepreneurship, which concerns the emergence of new economic activity and the way entrepreneurs identify new means-ends frameworks (i.e., opportunities) and bring their offerings to market under conditions of uncertainty (Read and Sarasvathy, 2005; Shepherd *et al.*, 2015). The ability to make appropriate decisions about how to use one's own skills and capabilities as well as the other means available to produce new means-ends bundles are important for entrepreneurial success. Making these decisions and acting on them becomes difficult in dynamic environments and when immediate outcomes are uncertain (McKelvie *et al.*, 2011; Uygur and Kim, 2014).

Hence, entrepreneurial expertise reflects the superior ability to judge—that is, to make decisions regarding specific entrepreneurial tasks under uncertainty (Sarasvathy, 2008; Unger *et al.*, 2009; Uygur and Kim, 2014). The literature asserts that expert entrepreneurs demonstrate superior performance when making these decisions by adapting their decision policies to the task at hand (Gustafsson, 2006) and preferring control-based strategies to deal with uncertain situations (Dew *et al.*, 2015). More generally, entrepreneurial expertise can be observed in content (i.e., what is being done), control (i.e., how action is performed), and context (i.e., where and when the action takes place) (Toft-Kehler *et al.*, 2014). The content of entrepreneurial expertise relates to identifying and evaluating entrepreneurial opportunities, identifying and acquiring essential resources, building effective networks, and making effective decisions about ventures (Baron and Henry, 2010; Dew *et al.*, 2009). The control dimension is characterized by avoiding prediction information, focusing on controllability, acting based on available means, leveraging contingencies, and establishing pre-commitments with various stakeholders (Chandler *et al.*, 2011; Sarasvathy, 2008). In other words, by focusing on controllable elements of the environment, entrepreneurs deal with uncertainty by creating conducive conditions for to shaping the future in a desired way (Dew *et al.*, 2015; Read *et al.*, 2009). More specifically, entrepreneurs start with resources they possess and search for alliances and pre-commitments with other people as a method of reducing perceived uncertainty (Dew *et al.*, 2008; Sarasvathy, 2001). Additionally, equipped with prior knowledge and experience, experts tend to be more flexible when facing unanticipated contingencies.

As in case of general expertise, research has asserted that experience, deliberate practice, and expert scripts play a role in the development of entrepreneurial expertise (see Table 1 for details). Additionally, researchers (Engel *et al.*, 2014) have started to look into beliefs, (i.e., entrepreneurial self-efficacy) to better understand what influences experts' behaviour. For example, the effectuation literature, commonly agreed to as a set of heuristics that expert entrepreneurs use, holds that in situations with high uncertainty, experts choose more control-based strategies (Dew *et al.*, 2015). However, research focusing on deliberate practice and knowledge structures has emphasized the differences between experts and novices rather than focusing on the development mechanism.

 Table 1 here

ACTION-CONTROL BELIEF–BASED MECHANISM OF ENTREPRENEURIAL EXPERTISE DEVELOPMENT

The Model

The discussion above implies that the development of entrepreneurial expertise is grounded in (entrepreneurial) action. Actions are defined as goal-directed intentional behaviours that lead to an outcome (Frese and Sabini, 1985; Skinner *et al.*, 1988), and according to Skinner and colleagues, they consist of a number of sequential components where relationships between agents, means, and ends are of key importance. Overall, action-control beliefs give rise to entrepreneurial action that results in performance outcomes (e.g., entrepreneurial expertise) (see Figure 1).

 Figure 1 here

Action can be best predicted by intentions (Krueger, 2007; Krueger *et al.*, 2000). Indeed, Krueger (2007) argues that behind entrepreneurial action, there are entrepreneurial intentions and behind those intentions are deep cognitive structures. Further, behind those deep cognitive structures are deep beliefs, which he defined as “deeply held strong assumptions that underpin our sense-making and our decision-making” (p.124). Intentional goal-directed behaviour is a function of three interrelated beliefs: strategy beliefs, capacity beliefs, and control beliefs (see Figure 2 and Table 2) (Skinner *et al.*, 1988). This goal-

directedness assumes that individuals are able to understand the relationship between themselves as agents, the means at their disposal, and goal-oriented outcomes (Chapman and Skinner, 1985). This reasoning implies that immediate and distant overall goals drive individuals' behaviour in different ways. While the overall goal might assume a willingness to create new value, it may not be specific enough to specify what this new value (i.e., means-ends framework) would be. Thus, action-control beliefs constitute an important and integral element of human agency and play a crucial role in (entrepreneurial) expertise development (Bandura, 1997; Skinner, 1995).

Figure 2 & Table 2 here

The role of action-control beliefs in expertise development

An action-control belief system is socially constructed and reflects subjective perceptions about the self and one's role in the environment (Weick, 1979). Action-control beliefs allow for the analysis of how control-related beliefs regulate action in cognitive performance (Skinner *et al.*, 1988). More specifically, means-ends beliefs are crucial to identifying possible courses of action without deciding beforehand whether means or ends come first, agency beliefs are important for selecting a strategy to reach a goal, and control beliefs are important for taking action. These three beliefs are important in understanding the motivation behind entrepreneurs' actions. For example, an individual's general perception of control influences what actions he or she sees as most desirable and thus which to pursue. Skinner (1995) suggests that agents hold beliefs not only concerning their own role in producing outcomes but also about what others believe and how agents can shape those beliefs.

Action-control beliefs are flexible and organized around interpretations of prior interactions in specific domains. Thus, beliefs are formed within deeper knowledge structures and reflect the interconnectedness of knowledge (Krueger, 2003). More specifically, the values and aspirations inherent in an individual's identity, past experience, and feedback influence that individual's beliefs and the subjectively perceived level of control he or she possesses. An increased perception of control is likely to positively impact an actor's willingness to act in the face of uncertainty (McKelvie *et al.*, 2011; Nordgren *et al.*, 2007). Consequently, relying on developed domain-specific expert knowledge helps increase perceptions of control, which increasingly results in behaviour based on control.

Strategy beliefs

Strategy beliefs are the most widespread beliefs among individuals as they include attributions of causes (Brännback and Carsrud, 2009; Skinner *et al.*, 1988). Individuals often have preconceptions about which action causes which effect (Brännback and Carsrud, 2009). While strategy researchers conventionally believe that strategy beliefs assume prediction and causality, the construct itself as discussed by Skinner and her colleagues does not necessarily distinguish between the primacy of either means or ends but solely emphasizes the causality between means and ends. Simply put, Skinner and colleagues (1988) emphasize that strategy beliefs refer to individuals' ability to see how new means-ends frameworks can be created (Sarasvathy, 2001). Hence, it is possible that individuals, particularly entrepreneurs, may either start with the effect and search for possible means to achieve the desired effect or may start with the means and consider which possible ends could be achieved with those means (Dew *et al.*, 2009). In other words, strategy beliefs can reflect both an effectual and a causal approach, and as such, the dependence of strategy beliefs on prediction varies (Dew *et al.*, 2015; Engel *et al.*, 2014).

Strategy beliefs involve a variety of different resources and the ways these resources can be used to produce new outcomes. For example, extant research has established that identity, knowledge, and social networks are central to determining an individual's intentions and direction of action. Based on these three basic means, it is possible to control the availability of other resources (Sarasvathy, 2008).

Consequently, increasing one's knowledge base increases the availability and individual awareness of different means-ends combinations and provides a basis for numerous potentially effective strategies to reach a desired end (Connell, 1985 cited in Skinner *et al.*, 1988). In particular, acquiring new knowledge can lead to changes in means-ends beliefs as one can consider new (re-)combinations, experiment with more possible (re-)combinations, maintain flexibility when using different means, and adapt to unexpected contingencies. In turn, the individual will be more likely to engage in entrepreneurial action and thereby develop his or her entrepreneurial expertise. Based on this reasoning, the following is proposed:

Proposition 1a: *The better developed the strategy beliefs, the more the entrepreneur is likely to engage in entrepreneurial action and thus develop entrepreneurial expertise.*

Capacity beliefs

Capacity beliefs are also called “agency beliefs” as they describe one’s perceived access to different available means to produce various outcomes. Capacity beliefs help an individual develop an action plan based on perceived access to means and previous patterns of action and performance outcomes (Chapman and Skinner, 1985; Krueger, 1993). For example, an entrepreneur may perceive that he or she has access to valuable social relationships that could be useful in gaining financial backing for his or her venture. This entrepreneur’s perception of having the ability to access means through social networks strengthens his or her preference for acquiring essential resources through this channel and, if needed, building effective networks. Focusing on intellectual ability, Wood and Bandura (1989) show that beliefs about one’s own intellectual ability affect performance. In their simulation, people who viewed their abilities as acquirable skills that can be enhanced through practice set challenging goals and subsequently performed well. Those who viewed intellectual ability as a fixed capacity saw errors as confirmation that they were not intelligent and consequently set low goals and performed poorly. In general, the more that individuals believe they have access to sufficient means, the more likely they are to experiment and remain flexible. Individuals who are confident in their access to means are usually good self-regulators who actively expand their knowledge and cognitive competencies (Bandura, 2001). Finally, capacity beliefs change as a result of new experiences and knowledge acquisition. Additional knowledge increases entrepreneurs’ perceptions of having sufficient means and thus their likelihood to engage in entrepreneurial action, and as a result, they develop entrepreneurial expertise. Based on this reasoning, the following proposition is put forth:

Proposition 1b: The better developed the capacity beliefs, the more the entrepreneur is likely to engage in entrepreneurial action and thus develop entrepreneurial expertise.

Control beliefs

Control beliefs refer to an individual’s view that he or she is able to achieve expected performance through his or her own actions, resembling self-efficacy beliefs (Bandura, 1997, 2001). In particular, Skinner (1995) argues that control beliefs represent an individual’s expectations about the likelihood of obtaining desired outcomes. In this sense, they can be compared to an internal locus of control, which presumes that outcomes are produced by one’s own actions (Lefcourt, 1982). Such beliefs emphasize an individual’s agency in either producing a positive outcome or preventing a negative one (Brewin and Shapiro, 1984). It is important to remember that individuals may report beliefs about control without reflecting on whether they in fact possess the means required to accomplish a specific task. In general,

control beliefs represent a commitment to act (Drnovšek *et al.*, 2010; Skinner *et al.*, 1988). Thus, the development of control beliefs increases one's propensity to undertake action. Control beliefs also influence the types of activities and environments individuals choose, and individuals' belief in their ability to complete entrepreneurial tasks affects their willingness to start a business and often differentiates entrepreneurs from managers (Chen *et al.*, 1998).

Furthermore, experience can strengthen an individual's previously held beliefs. In particular, both the examples others provide and a persistent subjective sense of success can change control beliefs, leading to a sense of competence and a willingness to experiment (Skinner, 1995). It has been implicitly assumed, for instance, that experience enhances entrepreneurs' ability to identify new means-ends relationships (Ucbasaran *et al.*, 2008). Thus, changing beliefs are likely to influence entrepreneurs' intentions and subsequent entrepreneurial action. This leads to the next proposition:

Proposition 1c: The better developed the control beliefs, the more the entrepreneur is likely to engage in entrepreneurial action and thus develop entrepreneurial expertise.

The moderating role of deliberate practice in entrepreneurial expertise development

Because the deliberateness of the mental effort put into practicing and improving skills and capabilities can boost performance outcomes, deliberate practice can be seen as a magnifier or intensifier of initial skills and capabilities—that is, it can be viewed as a moderator (Baron and Henry, 2010).

Developing strategy beliefs, that is the beliefs that particular means lead to particular outcomes can be achieved through engagement in new experience (Skinner, 1995). Additionally, current strategy beliefs can be re-affirmed through the deliberate practice of related tasks: for example, conducting focused experimentation to identify new combinations, innovating existing products, and finding new product uses. Such practice provides positive feedback for potential strategies, strengthening existing strategy beliefs and developing entrepreneurial expertise. In other words, the more knowledgeable individuals are, the more they can engage in experimentation and the more flexible they can be when using the means available to them and when determining what can be achieved with those means. Consequently, deliberate practice moderates the impact of strategy beliefs through experimentation and flexibility and subsequently helps individuals develop entrepreneurial

expertise, particularly the ability to identify entrepreneurial opportunities. Thus, the following proposition is offered:

Proposition 2a: Deliberate practice related to identifying new means-ends bundles moderates the positive relationship between strategy beliefs and entrepreneurial action, thus enhancing the development of entrepreneurial expertise.

Having identified new means-ends bundles, entrepreneurs must then evaluate the value of those bundles and their ability to exploit them successfully (Krueger, 1993). This task involves both identifying key resources and evaluating whether the entrepreneur can ensure access to them. Awareness of available means strengthens individuals' capacity beliefs and increases their willingness to act (Skinner, 1995). For example, entrepreneurs who have successfully introduced new products or services in the past generally believe they can do so successfully again. However, novice entrepreneurs without this experience are less likely to believe they can succeed even if they possess the necessary skills (Feltovich *et al.*, 2006). Deliberate practice focused on identifying and ensuring access to necessary resources is likely to encourage individuals to engage in entrepreneurial action because they will become more aware of their capacity beliefs and the available resources.

Relying on these capacity beliefs and effectively using the resources at hand provide more flexibility with and control over intended actions and their outcomes (Sarasvathy, 2008; Skinner, 1995). Consequently, as entrepreneurs gain expertise, they believe more in their capacity beliefs and start with what they have, then deliberately engage in building effective networks, and subsequently either create alliances or enter into pre-commitments with stakeholders to ensure access to essential resources (Chandler *et al.*, 2011; Dew *et al.*, 2009; Sarasvathy, 2008). Simply put, deliberate practice moderates the impact of capacity beliefs on entrepreneurial action and subsequently contributes to the development of entrepreneurial expertise. This leads to the next proposition:

Proposition 2b: Deliberate practice related to identifying and acquiring essential resources moderates the positive relationship between capacity beliefs and entrepreneurial action, thus enhancing the development of entrepreneurial expertise.

The ability to repeatedly and deliberately practice and to evaluate and reflect on one's own performance is particularly valuable and helps entrepreneurs reaffirm or even strengthen beliefs about their own capabilities. A perception of control tends to promote action, whereas

a perceived lack of control generally inhibits action (Lefcourt, 1982). Additionally, “a resilient self-belief in one’s capabilities to exercise control over events to accomplish desired goals’ is crucial to becoming successful” (Wood and Bandura, 1989, p. 364). Simply put, feeling in control is key to “taking the plunge.” Deliberate practice designed to develop the capability to accomplish desired goals—for example, finding a new customer, closing a sale, or hiring an employee—reinforces one’s control beliefs, providing entrepreneurs with performance feedback as well as making them more aware of their control beliefs. Also, carefully observing how experts bring a new product to market, acquire external financing, etc., can build confidence and feelings of being in control.

Therefore, the more entrepreneurs engage in deliberate action to develop their control beliefs, the more likely they are to be willing to undertake new actions and experiment. Moreover, the more varied the experiences, the broader the domain in which entrepreneurs feel competent, the more they feel in control, and the easier it is for them to remain flexible even in the face of uninviting conditions. Consequently, engagement in deliberate practice is likely to strengthen the positive relationship between control beliefs and entrepreneurial action, thus enhancing the development of entrepreneurial expertise. Based on this reasoning, the following proposition is put forth:

Proposition 2c: Deliberate practice related to performing tasks and achieving desired ends moderates the positive relationship between control beliefs and entrepreneurial action, thus enhancing the development of entrepreneurial expertise.

DISCUSSION

The basic premise of this paper is that entrepreneurial expertise develops alongside growing action-control beliefs. Whereas others have analyzed the differences between novice and expert entrepreneurs, this paper explores the mechanisms behind a novice turning into an expert. Theorizing about the process of expertise development, this paper encourages the reader to think about the complex role of the deeply held action-control beliefs that impact decision making, entrepreneurial action, and—consequently—the performance of new firms. It suggests directions in which education should develop to help nurture expert entrepreneurs.

The role of action-control beliefs in the development of entrepreneurial expertise

Expertise development is a reiterative process in which action-control beliefs play a vital dual role. On the one hand, action-control beliefs either promote or prevent action by influencing individuals' decision of whether and how (with what means and to what end) to undertake an action. On the other hand, they help individuals evaluate the outcomes of an action by attributing these outcomes to certain causes (Skinner, 1995). The interpretation and attribution of the causes of perceived success or failure for a performed action have the potential to change an individual's action-control beliefs by juxtaposing resulting new strategy, capacity, and control beliefs with those currently held. If the outcome was successful and the entrepreneur attributes this success to his or her ability and actions, his or her beliefs will likely be reinforced (Weiner and Kukla, 1970). If the outcome was positive but the entrepreneur does not believe his or her ability and actions were the reason for success, instead crediting luck or other individuals, his or her beliefs will likely remain the same. Similarly, if the outcome is negative and the result is attributed to a lack of ability, then the individual's beliefs are likely to weaken. However, if the failure is blamed on external circumstances, the individual's beliefs will likely remain as they were (Weiner, 1984). In other words, action-control beliefs act as both the starting point for action and the end point after the action has been evaluated.

Further, each of the three beliefs contributes in some way to an emerging reliance on non-predictive reasoning that prevails among expert entrepreneurs either by providing a perception of resourcefulness (Engel *et al.*, 2014); flexibility, knowledge, and creativity (D'Souza and Kemelgor, 2009); or feasibility (Dew *et al.*, 2015; Engel *et al.*, 2014), all of which represent entrepreneurial expertise. In particular, with growing knowledge of actions that involve lower reliance on prediction, individuals become increasingly more flexible when identifying attractive means-ends combinations. Consequently, as entrepreneurs gain expertise, they tend to move from using predictive logic to relying more on logic based on perceived control (cf. Dew *et al.*, 2015). For instance, when initially facing a situation that requires a decision, a novice entrepreneur is likely to search for available cues from solutions that have been used previously and approach the task as if the outcome has already been established. This can be seen as a way of dealing with uncertainty. However, with more entrepreneurial experience and better developed action-control beliefs, entrepreneurs generally become more aware of the different possibilities available and begin to experiment with the different effects they produce (Klayman, 1988). This paper suggests that this change is due to reinforced action-control beliefs. Developing action-control beliefs leads entrepreneurs to feel more in control. For example, new knowledge and new experiences

yield a broader portfolio of available choices, which can reinforce strategy beliefs. Equipped with broader strategy beliefs, entrepreneurs are better able to identify more possible means-ends frameworks relevant to the entrepreneurial endeavor (Sarasvathy, 2008). Similarly, a perception of improved resourcefulness (i.e., beliefs about access to means) and efficacy can lead entrepreneurs to consider more opportunities and even to create new opportunities (Sarasvathy, 2001). As a result, most entrepreneurs gradually and unconsciously begin to rely less on predictive information and more on what they already know and then use extant resources to exert more control over the dynamic environment in which they operate. They also tend to be less afraid of unexpected contingencies. As entrepreneurs repeatedly engage in entrepreneurial tasks, they are able to verify, strengthen, and change their action-control beliefs. Thus, action-control beliefs can stimulate perceptions of control and result in more expert behaviour.

Moreover, the independent nature of these three beliefs helps explain why some novice entrepreneurs behave as experts in certain situations or why some individuals only become experts in certain aspects of the entrepreneurial process (e.g., identifying opportunities or growing ventures). An individual with strong strategy beliefs may be very capable of imagining or creating new products but not of bringing them to market. An individual with very broad and strong control beliefs may expertly build effective networks and leverage contingencies but not be able to identify new opportunities. Previous studies have attributed the different preferences for either identifying or exploiting opportunities to different learning styles. In contrast, the proposed model suggests that entrepreneurs feel more comfortable with different aspects of the entrepreneurship process because of their personal action-control beliefs—that is, either identifying new means-ends frameworks because of stronger strategy beliefs or harnessing their own ability and motivation by acting based on stronger capacity or control beliefs. Also, Engel et al. (2014) find that individuals with a high degree of entrepreneurial self-efficacy rely much more on effectuation (i.e., the logic of control). They argue that this relationship helps explain how some novice entrepreneurs can behave in an expert manner (Baron, 2009; Dew *et al.*, 2009). With this in mind, this paper provides a step toward better understanding the role of each of the three beliefs and their implications for change.

The role of deliberate practice

Not every new experience changes action-control beliefs or develops entrepreneurial expertise (Williams, 2001). Small changes in action-control beliefs tend to improve only

current practices and often do not result in the adoption of more effective strategies. Usually, only substantial changes in action-control beliefs lead to changes in knowledge structures and new connections between existing knowledge and newly acquired expertise. This paper argues that the positive relationship between positive changes in action-control beliefs and entrepreneurial action will be greater among individuals who engage in deliberate practice. Deliberate practice facilitates expertise development by improving cognitive capabilities and strengthening the impact of action-control beliefs. More specifically, while improving domain knowledge contributes to the recognition and understanding of new means-ends bundles and their application, enhanced cognitive resources help entrepreneurs see connections between the information they receive and the knowledge they already possess as well as reaffirm their beliefs. Consequently, most individuals who deliberately practice entrepreneurial tasks will be able to better organize incoming cues and will eventually be able to more quickly assimilate changed action-control beliefs. This, in turn, will likely lead to expertise development.

Because strategy, capacity, and control beliefs serve as starting points for intentional action and given the basic function of each of these beliefs, the deliberate entrepreneurial practice could emerge in response to the three basic functions. For example, the basic function of strategy beliefs is to identify new means-ends bundles (Skinner, 1995). In this context, deliberate practice involves flexible experimentation with different combinations of means and ends in order to identify those that could potentially be successful. Developing new products, improving existing products, and identifying new markets are all types of experimentation. Training for these activities can be found in hands-on entrepreneurship courses and workshops, experimentation labs, entrepreneurship-simulation games, etc. On the other hand, deliberate practice of skills related to capacity beliefs relies on the awareness of available means and the ability to ensure access to them. It involves bootstrapping activities to learn flexibility and practice in establishing alliances and closing pre-commitments with various stakeholders, including funders, employees, or potential customers (Read and Sarasvathy, 2005). These activities could be learned by participating in different networks, interacting directly with stakeholders, or conducting simulations. Finally, control beliefs correspond to self-efficacy beliefs and relate to having confidence in being able to achieve desired ends (Bandura, 1997; Skinner, 1995). Here, deliberate practice involves experimentation. Thought experiments could be specific in nature, such as turning an idea into a product or service or finding a new customer; they could also be more general, such as how to deal with uncertainty, make decisions, etc. Again, as with self-efficacy, these tasks could be practiced both directly and vicariously (Bandura, 2001; Baron and Henry, 2010). Further, deliberate practice can magnify the strength of the impact that particular strategy,

capacity, and control beliefs have on entrepreneurial action and expertise. Simply put, deliberate practice helps reaffirm action-control beliefs over time through repetition and reflection.

Implications for education and practice

Understanding what develops and improves performance has important implications for entrepreneurs, educators, and policymakers. Developing entrepreneurial expertise means being able to deliver superior entrepreneurial performance; it often means developing the capability to act effectively when faced with new experiences.

The suggested model of entrepreneurial expertise development has three primary implications for practitioners and educators. First, it stresses the agency role of the individual. If individuals are uncertain about whether they have (or may get) access to tools they consider useful for solving problems, the strategies they adopt may be ineffective. In other words, an active belief in one's own resourcefulness, a belief that certain combinations can be created and certain strategies employed, and a belief in one's own efficacy (Chandra Bayon *et al.*, 2015) must all be present for acquired knowledge to contribute to superior performance. Consequently, this carries a policy implication for educational systems: they should put equal emphasis on providing knowledge and developing students' action-control beliefs about how they can best use this knowledge with their own capabilities. For example, networking and creating partnerships is a good exercise to practice one's own agency in gaining access to resources, brainstorming and creativity help develop strategy beliefs, and pitching and securing customers contribute to control beliefs. Second, this paper underscores the need to develop the ability to learn, experiment, and challenge oneself when assessing one's own resourcefulness, creativity, and efficacy. This means that educational programs should engage in more knowledge co-creation, provide space for discussions and experimentation, and guide students in this process. For example, creating possibilities to gain first-hand entrepreneurial experience will provide students the opportunity to test and challenge their own beliefs. Third, one of the implications from the presented model is that action-control beliefs function both as starting points and as end points. This means that though it is important to be aware of personal beliefs and the ways they influence decision making and entrepreneurial action prior to engaging in a task, it also must be recognized that beliefs can change as a result of performing the task or evaluating its outcomes. Hence, it is vital to develop a habit of reflecting on one's own action-control beliefs after particular entrepreneurial tasks have been accomplished (e.g., have my beliefs about possible solutions changed, has my perception

about my own resourcefulness and efficacy changed?). Interestingly, beliefs not only stem from direct experience but can also be acquired by observing experts' behaviour and learning from appropriate cases (Bandura, 1997). As a result, it is important to actively focus on teaching techniques that help students reflect on and reinforce their action-control beliefs and their importance in entrepreneurial activity. For example, discussing both successful and unsuccessful cases can be a good way to reflect on action-control beliefs. Similarly, simulation games may provide the opportunity to deliberately practice certain tasks and decisions and then reflect on their impact on held beliefs.

Research limitations

One of the limitations of this paper is that the model was developed conceptually and requires empirical testing and validation. This model testing and validation could be performed as a real-time longitudinal study both among independent entrepreneurs and in corporate entrepreneurship settings. An approach combining the methodology used by Skinner et al. (1988) with tools adopted by Ericsson et al. (1993) makes testing the model on the operationalization and measurement levels possible.

Further, the paper discusses expertise on an aggregate level without specifying different dimensions of expertise. Future studies should examine the different elements and dimensions of expertise—for example, expertise related to identifying new means-ends frameworks (e.g., opportunities), expertise related to acquiring access to needed resources (e.g., resourcefulness), or expertise related to executing tasks. Approaching expertise in this way could enable researchers to combine the two different performance spaces of entrepreneurial expertise: content (i.e., the venture) and control (i.e., the individual) (cf. Toft-Kehler *et al.*, 2014).

Further research

Future research into the subject could focus more on the boundaries and further applicability of the theory and test them in real-life settings (Ericsson *et al.*, 2006). Specifically, building on the proposed relationship between the different variables, research investigating the mechanisms that facilitate changes to action-control beliefs, their direction (positive/negative), and the interdependencies between the three beliefs would contribute valuable insights. Given that most research on experts and their expertise is experimental, researchers have called for more research in real-world settings, not laboratory settings. Consequently, research adopting a longitudinal design and following entrepreneurs for long

periods of time in their context (i.e., communities of practice) would be most suitable.

Further, engaging in deliberate practice is difficult in an entrepreneurial context (Baron, 2009). Entrepreneurs tend to be generalists and require a broad array of skills and competencies to succeed, the tasks and processes involved in the identification and exploitation of an opportunity are often opportunity and context specific, so deliberately training all of these skills is challenging (Baron and Henry, 2010). Therefore, research exploring what could constitute a basic unit of deliberate practice in the entrepreneurship context could help understand the concept better.

Another avenue worth exploring is the relationship between the level of acquired expertise and resulting (over)confidence as well as the relationship between (over)confidence and flexibility. Increasing knowledge and experience enhances the flexibility of identified means-ends frameworks. However, relying on cues that have worked in the past may lead to relative inflexibility with new situations (Dane, 2010). Similarly, while confidence and perceived control are important drivers of entrepreneurial action, overconfidence (also resulting from previous successes) can lead to negative results and can cause individuals to neglect important and relevant cues in the decision-making process. Thus, exploring the relationship between these variables offers the possibility to explore the boundaries of the suggested theory.

CONCLUSION

The main contribution of this paper is twofold. First, this paper develops a model that explains the mechanisms underlying the development of entrepreneurial expertise and provides a rationale for the adoption of non-predictive (control) logic. More specifically, because perceived control (i.e., action-control beliefs) reflects the fundamental need for competence (Skinner, 1995), the development of entrepreneurial expertise rests on reinforcing action-control beliefs. Simply put, individuals want to learn as much as possible about effective and ineffective strategies, about their own capacities, and about their inherent limitations in order to succeed. While extant entrepreneurship research has highlighted the role of entrepreneurial self-efficacy (Chen *et al.*, 1998; McGee *et al.*, 2009), this paper extends that research by suggesting that strategy and capacity beliefs are also key to entrepreneurial action and entrepreneurial expertise development. This means that efficacy beliefs are a necessary but insufficient element for the development of expertise. They must be developed alongside capacity beliefs and strategy beliefs. Consequently, each of the three

beliefs plays an important role in the development process. They can develop at a different pace depending on the time and effort the individual invests in deliberately practicing each of them. Thus, understanding how entrepreneurial expertise develops requires understanding how an individual's perceived level of control over means and ends as well as his or her own efficacy develops over time.

Second, while extant research has asserted that deliberate practice plays an important role in expertise development (Ericsson *et al.*, 1993), this study suggests that deliberate practice is a moderator in this process. The deliberate practice of entrepreneurial tasks enables individuals to better integrate practiced skills with existing knowledge (Baron and Henry, 2010) and, as such, strengthens beliefs about the relationships between the different elements. Consequently, the more an entrepreneur engages in deliberate practice, the more his or her knowledge becomes integrated and the more his or her action-control beliefs develop. Conversely, the less deliberate the practice, the less integrated the knowledge and the longer it takes for a changed belief to cause a noticeable improvement in performance.

In summary, the theorized model offers a more nuanced explanation for findings from previous studies on the behavioural patterns of expert entrepreneurs (e.g., Chandler, *et al.*, 2011; Dew, *et al.*, 2009). More specifically, this paper argues that better developed action-control beliefs make entrepreneurs aware of different means-ends combinations and the multiplicity of means available as well as encourage them to approach these combinations flexibly and experiment. The suggestion that deliberate practice boosts the influence of action-control beliefs on expertise development by contributing to knowledge integration appears to correspond with findings from expertise studies that evaluate knowledge structures as a distinguishing characteristic between novice and expert entrepreneurs (Baron and Henry, 2010).

While this paper theorizes on the development of entrepreneurial expertise, the hypothesized mechanism of expertise development can likely be generalized to other management domains as it is based on the general need to feel in control.

Figure 1. The model of entrepreneurial expertise development

Figure 2. Action-control beliefs framework (adapted from Skinner et al., 1988)

TABLE 1. Extant research on entrepreneurial expertise

Approach	Author(s)	Focus on	Findings
Deliberate practice	Baron (2009)	The importance of deliberate practice.	Deliberate practice is necessary for the development of entrepreneurial expertise. Its role in entrepreneurship research remains under-investigated.
	Baron & Henry (2010)	Acquisition of capacity to excel.	Entrepreneurial expertise refers to the task of identifying and evaluating business opportunities as well as acquiring essential resources. Engagement in deliberate practice—direct or vicarious.
Knowledge structures	Mitchell (1994), Mitchell, Mitchell, Mitchell (2017)	Expert scripts.	Expert entrepreneurs have developed arrangement, ability, and willingness scripts.
	Mitchell & Chesteen (1995)	The role of exposure to expert entrepreneurs.	Entrepreneurs enhance their expertise through interactions with expert entrepreneurs.
Experience	Dew et al. (2009), Read & Sarasvathy (2005), Sarasvathy (2001, 2008)	Effectuation as a form of entrepreneurial expertise. Elements of entrepreneurial expertise.	Expert entrepreneurs frame decisions using effectual logic, whereas novices use a predictive frame. Effectuators generate constraint-satisfying solutions rather than searching for optimal solutions; make rather than find opportunities; and convert “as-if” propositions into “even-if” propositions. The principles are: 1) focus on experiments, 2) affordable loss, 3) pre-commitments and strategic alliances, and 4) exploiting environmental contingencies.
	Chandler et al. (2011)	Validation of effectuation and causation scales.	Causation is a unidimensional construct, while effectuation is a multidimensional formative construct. The degree to which one effectuates is an amalgamation of involvement in each of the sub-dimensions of effectuation (i.e., experimentation, flexibility, affordable loss).
	Toft-Kehler, Wennberg, & Kim (2014)	The role of experience for superior performance.	The positive experience-performance relationship only appears among expert entrepreneurs, whereas novice entrepreneurs may actually perform increasingly worse because of their inability to generalize their experiential knowledge accurately into new ventures.
	D'Souza and Kemelgor (2009)	Prior knowledge and experience in an industry.	Serial entrepreneurs become experts only if they confront repeated sameness. Better results are achieved only if the domain/context of the business is the same; otherwise, the outcomes of entrepreneurial action by novice and serial entrepreneurs do not differ substantially.

	Engel, Dimitrova, Khapova, & Elfring (2014)	Entrepreneurial self-efficacy and the use of effectuation.	Novices who experienced an increase in entrepreneurial self-efficacy are more likely to use effectuation under uncertainty. This relationship is mediated by framing the situation as an opportunity.
	Gustafsson (2006)	Entrepreneurial decision making among experts and novices.	Expert entrepreneurs adapt their decision-making logic (analytical, quasi-heuristics, intuitive) to the characteristics of the task at hand, whereas novices predominantly use analytical tools.
	Dew et al., (2015)	Who uses control to make decisions and when.	Experts select options that are more uncertain to be able to rely on control in making their decisions.

TABLE 2. Action-control beliefs framework in the entrepreneurship context

Action-control beliefs	Relationship	Example (from the original domain)	Example in the entrepreneurship context
Strategy beliefs	Means-Ends	What does it take to do well and avoid failure in school?	What does it take to solve my customer's problem?
Capacity beliefs	Agent-Means	Do I have the skills to do well and avoid failure in school?	Do I have the skills/ resources necessary to introduce a new product into a new market?
Control beliefs	Agent-Ends	Can I do well in school if I decide to?	Can I turn this prototype into a well-selling product?

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