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Entrepreneurial Action and Competencies: Exploring Pathways to Venturing Accomplishments

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Abstract: Scholars often cite an entrepreneur's actions and their skills, know-how and entrepreneurial competencies (ECs) as the most influential factors related to the accomplishment of important venturing outcomes. Yet the joint impact of these factors on venturing accomplishments is yet to be explored. This paper aims to fill this void by empirically developing and testing a mediation model exploring three EC mechanisms by which entrepreneurial actions—specifically discovery and exploitation activities—led to the achievement of specific venturing accomplishments—namely the time to breakeven and turnover achieved. Data were collected from 1150 South African entrepreneurs using an online survey. Covariance-based structural equation modeling was used to test the hypothesized model. Results show that entrepreneurial action (EA) significantly impacts on the efficiency and effectiveness of a venture through the development of three key ECs. Furthermore, the type of action taken by entrepreneurs during the entrepreneurial process differentially influences competency development and venturing accomplishments. More specifically, opportunity discovery and exploitation activities have a varying impact on EC development, as the engagement in these distinct venture-related activities provides unique feedback for the development of appropriate behavioral scripts for specific contexts which lead to distinct venturing accomplishments. This research offers novel insights into the newly emerging scholarly conviction that engagement in the entrepreneurial process itself may affect key entrepreneurial abilities and accomplishments. In so doing, this paper builds on, and has implications for, theories of competency development and venturing performance, as well as pedagogical interventions aimed at enhancing entrepreneurship.

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1 Introduction

Entrepreneurs regularly face considerable challenges and setbacks in an environment characterized by extreme uncertainty, rapid change and information and resource scarcity (Baum and Locke 2004; van Gelderen 2012; van Gelderen, Kautonen, and Fink 2015). Therefore, understanding how individuals can develop and enact the competencies necessary in this environment to achieve desired venturing outcomes is imperative (Morris et al. 2013).

Entrepreneurial competencies (ECs), defined as the skills and abilities required to launch and successfully grow a sustainable business under conditions of dynamism, ambiguity and volatility, have seen significant scholarly interest in terms of their consequences for entrepreneurial action (EA) (Morris et al. 2013; Santos, Caetano, and Curral 2013). Scholars have asserted that, beyond facets of personality such as extraversion and need for achievement (Obschonka and Stuetzer 2017), ECs are essential drivers of EA (Mitchelmore and Rowley 2010; Mulder et al. 2007). EA refers to “the concrete, theoretically observable actions of individuals (as solo entrepreneurs or as part of a team of entrepreneurs) in the start-up or early stages of organization creation” (Bird, Schjoedt, and Baum 2012, 890). Thus the construct necessarily entails a process of emergence (Vahidnia et al. 2017). For example, several studies have explored how ECs enhance the discovery and exploitation of entrepreneurial opportunities (Santos, Caetano, and Curral 2013), particularly following an entrepreneurship education intervention (Morris et al. 2013). To the extent that the emphasis remains on ECs as predictors of EA, this body of work typically takes ECs as ‘given’: they must exist before EA can occur and venturing outcomes can be achieved (Grégoire, Corbett, and McMullen 2011). However, empirical attention is yet to be given to the notion that the decision to pursue an entrepreneurial opportunity (i.e., EA) in itself may impact on the competencies of the decision-maker as a consequence of a learning process (Shepherd, Williams, and Patzelt 2015). Also the enactment of these competencies may lead to important venturing accomplishments (Morris et al. 2013). To this end, a sizable theoretical and empirical gap exists which limits scholarly understanding of the pathways through which the entrepreneurial activities related to the discovery and exploitation of an opportunity influence venturing accomplishments.

Building on structuration theory (ST) (Giddens 1984), previous work on ECs (Morris et al. 2013), as well as EA (McMullen and Shepherd 2006; Shane and

Venkataraman 2000), has addressed this important gap by proposing that since ECs can be understood as an outcome of learning scripts obtained through one's interaction with one's environment (Morris et al. 2013), EA is a key driver of ECs, which explains how venturing accomplishments are achieved. In accordance with this, a mediation model is developed and tested, exploring the three EC mechanisms by which EAs—specifically discovery and exploitation activities—lead to specific venturing accomplishments; specifically, the time to breakeven (efficiency) and turnover (effectiveness) achieved. In particular, it is proposed that through the generation of behavioral feedback, EA enhances ECs, which play a central mediating role in explaining how shorter breakeven times and higher turnover, as essential venturing accomplishments, are achieved. These hypotheses were tested using a sample of 1150 entrepreneurs in the developmental phase of their business. Furthermore, consistent with the principle in ST that distinct actions lead to distinct learned scripts (Giddens 1984), specific entrepreneurial activities, competencies and venturing accomplishments are explored. This is specifically to generate more discerning and nuanced insight into the hypothesized relationships, rather than more abstract, multi-dimensional conceptualizations, such as 'overall' action, competence or venture performance, which may lead to interpretational confounding and validity concerns (Anderson, Eshima, and Hornsby 2018; Bagozzi 2011).

By doing so, several contributions emerging from this paper are noteworthy. First, despite a growing body of empirical work (e.g., Bird 1995; Kyndt and Baert 2015; Morris et al. 2013; Santos, Caetano, and Curral 2013), there remain several unanswered theoretical and empirical gaps regarding the role of EA and ECs throughout the entrepreneurial process (Shane and Venkataraman 2000). This study provides robust insight into the question of how engaging in the entrepreneurial process, may, in itself, dynamically affect subsequent decisions and venturing accomplishments (Shepherd, Williams, and Patzelt 2015), as well as EC development (Morris et al. 2013). This is a notable contribution, as this paper provides important confirmation of EA's role in influencing ECs and venturing accomplishments. It thereby contributes towards the perhaps more veridical, but less understood, possibility that the majority of entrepreneurs simply "learn as they go", and that this process of engagement contributes to the achievement of important venturing outcomes (Grégoire, Corbett, and McMullen 2011).

Second, scholars are beginning to recognize that most antecedents of venturing performance have positive as well as negative effects when considering more specific venturing outcomes (Busse, Mahlendorf, and Bode 2016); it is often inappropriate to consider venturing accomplishments as a unidimensional 'performance' construct (Murphy, Trailer, and Hill 1996). For example, a tendency to explore novel ideas has been shown to enhance the effectiveness, but not the

efficiency of a venture (Auh and Menguc 2005). Using a similar approach to Auh and Menguc (2005), and consistent with the calls of other scholars (Lerner, Hunt, and Verheul 2018; Murphy, Trailer, and Hill 1996), this paper demonstrates the discrete impact of EA and ECs on venturing accomplishments—efficiency and effectiveness of the venture through breakeven and turnover respectively. This paper thus provides a more nuanced insight into the benefits of certain types of EA for specific ECs and specific venturing accomplishments.

Finally, by demonstrating how engaging in the entrepreneurial process affects specific competencies and venturing outcomes, this paper offers important implications for entrepreneurs as well as entrepreneurship education interventions. While experiential learning methods are gaining popularity in entrepreneurship education interventions, the assumption still exists in most interventions that competencies must be developed for action to occur and venturing outcomes to be achieved (Brush and Noyes 2012). Yet this paper demonstrates that learning-by-doing may be highly beneficial to entrepreneurs seeking enhanced ECs and venturing outcomes. Thus, these findings further support entrepreneurship interventions using more experiential learning approaches (Bliemel 2014; Middleton and Donnellon 2014), while simultaneously informing students what types of activities could specifically be conducted to lead to specific desired outcomes.

This paper proceeds with a review and conceptual background on EA, ECs, and venturing accomplishments as the key concepts of the theorized model. Then hypotheses are developed and presented, which are thereafter supported with covariance-based structural equation modeling. The paper concludes by discussing the theoretical and practical implications, and identifying limitations and future research directions.

2 Theoretical Framework

Venturing performance is often considered as the ultimate desired outcome variable in both empirical and theoretical research in the entrepreneurship domain (Man, Lau, and Chan 2002). In this regard, the entrepreneurs' actions (Lichtenstein et al. 2007), as well as their skills, know-how and competencies, are often cited as the most influential factors related to the performance or accomplishment of an entrepreneurial venture (Man, Lau, and Chan 2002). Yet the joint impact of these factors on venturing accomplishments is yet to be explored. Perhaps this is due to a lack of agreement on the key metrics of venture performance (Wach et al. 2020), as well as the high likelihood that ECs will differentially impact on specific venturing accomplishments, depending on which ones are considered (Politis 2005; Shepherd et al. 2019). Drawing from Shepherd et al. (2019), this paper specifically refers

to the term venturing accomplishments rather than venturing performance, to highlight the multiplicity of desired outcomes and the need for more discrete analyses, as opposed to an abstract venturing performance conceptualization which is more difficult to interpret.

This paper commences with the development of the key concepts surrounding EA and ECs, as well as venturing accomplishments broadly characterized by their efficiency or effectiveness. Thereafter, ST (Giddens 1984) is used to inform the theoretical development of a model linking the three constructs.

2.1 Entrepreneurial Action (EA)

Prior research relies on several varying conceptualizations or taxonomies of EA, such as the abstractness of EA (Chen et al. 2018), the level of volition required by the action (Delanoë-Gueguen and Fayolle 2018), or action as exploration or exploitation (Mueller, Volery, and Von Siemens 2012). This paper, however, specifically focuses on EA using the typology of actions falling under opportunity discovery and exploitation. Hence, consistent with this process perspective, and, perhaps as the most theoretically well-grounded typology (which should facilitate knowledge accumulation) (Davidsson 2018; Farmer, Yao, and Kung–Mcintyre 2011), this research relies on the discovery/exploitation structure initially put forward by Shane and Venkataraman (2000). This structure views the discovery and exploitation of an opportunity as two necessary and mutually dependent stages, which lead to the emergence of new ventures and broadly characterize the vast range of smaller activities taken throughout this process of emergence (Shane and Venkataraman 2000).

Discovery results from early-stage venture idea generation and development activities, such as thinking about the idea, identifying market opportunities, and evaluating the feasibility and desirability of the venture concept (Vogel 2017). On the other hand, exploitation results from later-stage implementation or execution of the venture concept, such as acquiring the necessary funding, facilities and materials, as well as creating a legal entity and registering with the tax authorities (Mueller, Volery, and Von Siemens 2012; Shane and Venkataraman 2000).

2.2 Entrepreneurial Competencies (ECs)

For years, entrepreneurship scholars have sought to determine the key competencies for accomplishing desired outcomes in the entrepreneurial context (Bird 1995; Mamabolo, Kerrin, and Kele 2017), and the central antecedents of these competencies (Man, Lau, and Chan 2002). Similarly, scholars have relied on

varying conceptualizations of ECs, such as competence as a minimum standard of performance used to evaluate a specific domain of activity (Bird, Schjoedt, and Baum 2012), or competencies as demonstrated through actions by an individual in a specific context (Mitchelmore and Rowley 2010). A specific focus is given on the latter conceptualization since ECs can, ultimately, only be demonstrated through an individual's concrete behaviors (Man, Lau, and Chan 2002), which are seen as the most proximal outcomes of knowledge and abilities (Bird, Schjoedt, and Baum 2012). Consistent with other scholars, it is argued that the abilities to quickly recognize lucrative opportunities (Venkataraman et al. 2012; Vogel 2017), create value (Dyer, Gregersen, and Christensen 2008; Lepak, Smith, and Taylor 2007), and take risks (Knight 2012) are central to accomplishing the emergence of a venture which is both efficient and effective. Thus, this paper focuses on these three key ECs: opportunity recognition; value creation abilities, and calculated risk-taking.

Opportunity recognition is the ability to perceive conditions or potentialities in the environment that signify latent sources of income for a venture (Morris et al. 2013). Value creation is the ability to generate a new business offering which offers sufficient consumer benefits to produce revenues exceeding its costs (Lepak, Smith, and Taylor 2007). Calculated risk-taking is the ability to take risks when engaging in EA and to also act in such a way as to minimize the probability of negative consequences and the impact thereof (Morris et al. 2013). This paper, therefore, focuses on the role the three ECs play in explaining an entrepreneur's venturing accomplishments.

2.3 Venturing Accomplishments: An Efficiency and Effectiveness Perspective

While significant attention has been given to the impact of the ECs on EA, less attention has been given to predicting specific venturing accomplishments emerging from ECs, such as reaching the breakeven point and achieving a certain level of turnover. This dearth of investigation is somewhat surprising, given that initial research into ECs was primarily driven by aspirations to accomplish superior venturing performance outcomes (Herron and Robinson 1993; Mitchelmore and Rowley 2010). Perhaps a major cause of this dearth is the high likelihood that ECs will differentially impact specific venturing accomplishments, depending on which EC and venturing accomplishment are considered (Politis 2005; Shepherd et al. 2019). Specifically, this paper focuses on the time taken for a venture to breakeven as well as the level of turnover achieved, as two key venturing accomplishments which are particularly appropriate indicators of efficiency and

effectiveness respectively (Auh and Menguc 2005). Efficiency refers to the output achieved with a given input, while effectiveness refers to the degree to which a desired result is achieved, typically in venture terms, conceptualized as obtaining paying customers (Davis and Timothy 2002).

While breakeven refers to the point at which revenue covers expenses and zero profits or losses are made, turnover refers to the total revenue or sales generated (Scott and Bruce 1987; Yang and Danes 2015). The breakeven period is a critical metric which demonstrates an initial benchmark of efficiency in terms of the feasibility of the exploited opportunity and the potential to begin generating a profit and building a financially stable venture (Scott and Bruce 1987; Yang and Danes 2015). Similarly, turnover or revenue is a key metric, particularly for entrepreneurial ventures which, more than seeking profits, are interested in demonstrating demand for, or effectiveness of, their value proposition through sales and revenue (Clarysse, Bruneel, and Wright 2011; Longenecker et al. 2013). The next section will focus on these two venturing accomplishment metrics and hypothesize the effect of the discovery and exploitation of EAs on these metrics, through the opportunity recognition, value creation abilities, and calculated risk-taking ECs as mediators.

2.4 A ST Framework Connecting EA and ECs to the Efficiency and Effectiveness Venturing Accomplishments

Consistent with the work by Morris et al. (2013), ST or structuration theory is employed as a framework for this paper's hypotheses. A core supposition of this paper is that ECs are developed over time through the EA undertaken by an individual. This notion is inherently different from previous EC work, which generally considers how entrepreneurship education interventions develop ECs which influence EA (Morris et al. 2013). Yet, in either case, the underlying premise of ST holds—ECs are a result of learned scripts developed through the interactions between an individual and their environment (Giddens 1984). Learned scripts refer to guidelines or a framework of how to behave within specific contexts (Morris et al. 2013).

2.5 Action Stage and ECs

ST suggests that scripts are formed through experience or feedback obtained in the environment which indicates whether a script works in a particular situation and should be accepted (Chiasson and Saunders 2005). It is thus posited that EA will

play a pivotal role in this developmental process, acting as a key driver of feedback to further test one's understanding of the entrepreneurial context and mold behaviors to be more efficient and effective. Indeed, scholars are beginning to recognize that the very decision to pursue an entrepreneurial opportunity (i.e., take EA), may influence the attitudes, aspirations, and abilities of the decision-maker, possibly through the feedback or information revealed by that decision (Shepherd, Williams, and Patzelt 2015).

The entrepreneurial context is characterized by uncertainty, with the potential outcomes of one's actions being unknown and dependent on various actors which, in turn, are dependent on yet other actors (Townsend et al. 2018). Therefore, since entrepreneurial ventures have few established procedures or scripts of action (Stinchcombe 2000), with little initial information or feedback on which to base decisions (Huang and Pearce 2015), a logic of action may be more appropriate to gain the necessary feedback (Wiklund, Patzelt, and Dimov 2016), before developing efficient and effective scripts for behavior (i.e., ECs). Determining whether a script works depends on the particularities of the business context, in that the entrepreneur must understand and respond to this feedback from discovering and exploiting an opportunity, in order to recognize, produce, and modify appropriate scripts which, ultimately, form the crux of business advantage and performance outcomes (Chiasson and Saunders 2005). On the basis of this reasoning, the following is hypothesized:

Hypothesis 1: Opportunity discovery is positively related to the opportunity recognition, value creation, and calculated risk-taking ECs.

Hypothesis 2: Opportunity exploitation is positively related to the opportunity recognition, value creation, and calculated risk-taking ECs.

In addition, given that opportunity discovery is more exploratory, involving venture idea development, experimentation and search for the most potentially lucrative venture concept (Mueller, Volery, and Von Siemens 2012; Vogel 2017), it is argued that opportunity discovery activities will be more strongly related to the key ECs being investigated. On the other hand, opportunity exploitation is more implementation oriented, involving administrative and resource orchestrating behaviors (Mueller, Volery, and Von Siemens 2012). Therefore, it would make sense that ECs related to recognizing opportunities, finding a way to create value from opportunities, and taking calculated risks to pursue opportunities, are more exploratory (March 1991), and hence more strongly developed by discovery activities. Thus, it is hypothesized that:

Hypothesis 3: Opportunity discovery is more strongly related to the development of opportunity recognition, value creation, and calculated risk-taking ECs than opportunity exploitation.

2.6 Indirect Effects of EA on Venturing Accomplishments Through the ECs

Competency research was initially motivated by the notion that ECs may be important antecedents to achieving superior performance outcomes (Mitchelmore and Rowley 2010). Consequently, using ST, scholars have theorized that entrepreneurs earn their business advantage and accomplish desired venturing outcomes through the recognition, production, and modification of appropriate scripts based on feedback from acting in a venturing context (Chiasson and Saunders 2005).

Consistent with this, it is proposed that EA influences venturing accomplishments through effects on the three ECs investigated. More specifically, it is contended that opportunity discovery and exploitation activities lead to EC development as the engagement in venture-related activities provides ample feedback for the development of appropriate behavioral scripts (Giddens 1984; Grégoire, Corbett, and McMullen 2011; Morris et al. 2013). The greater this engagement, the greater will be the feedback for EC development, which should enhance the potential for superior venturing accomplishments such as quicker breakeven periods and higher levels of turnover (Mitchelmore and Rowley 2010). Thus, it is hypothesized:

Hypothesis 4: There is an overall positive indirect relationship between opportunity discovery and the venturing accomplishments, mediated through (a) opportunity recognition, (b) value creation, and (c) calculated risk-taking ECs.

Hypothesis 5: There is an overall positive indirect relationship between opportunity exploitation and the venturing accomplishments, mediated through (a) opportunity recognition, (b) value creation, and (c) calculated risk-taking ECs.

2.7 EA and Efficiency Versus Effectiveness Accomplishments

In addition, given that breakeven time and turnover appear to represent efficiency and effectiveness accomplishments respectively (Auh and Menguc 2005), it is also

proposed that the impact of EA through the opportunity recognition, value creation, and calculated risk-taking ECs, will differ between breakeven and turnover. While the breakeven period indicates efficiency in terms of the initial feasibility of an opportunity and the potential to generate a profit (Scott and Bruce 1987; Yang and Danes 2015), turnover indicates effectiveness in terms of generating a value proposition for which there is a demand and which effectively solves a customer need (Clarysse, Bruneel, and Wright 2011; Longenecker et al. 2013). The ECs related to recognizing opportunities, finding a way to create value from them, and taking calculated risks to pursue them, are more exploratory in nature and aimed at searching, innovating and risk-taking to provide effective solutions to customer problems (March 1991; Mueller, Volery, and Von Siemens 2012). Therefore, the impact of EA through the opportunity recognition, value creation, and calculated risk-taking ECs will probably be stronger for venturing accomplishments indicating effectiveness (i.e., turnover), as opposed to efficiency (i.e., breakeven). On this basis, the following is hypothesized:

Hypothesis 6: The overall positive indirect effect of EA is stronger for effectiveness (turnover) than for efficiency (breakeven time).

Given this efficiency/effectiveness distinction, it is further suggested that there are differential indirect effects between opportunity discovery and exploitation in impacting breakeven and turnover. In particular, since opportunity discovery is more exploratory, involving searching for the most (potentially) lucrative venture concept (Mueller, Volery, and Von Siemens 2012; Vogel 2017), while opportunity exploitation involves administrative and resource orchestrating behaviors (Mueller, Volery, and Von Siemens 2012), it is proposed that discovery will more strongly affect effectiveness indicators such as turnover, while exploitation will more strongly influence efficiency indicators such as breakeven. It is, therefore, hypothesized that:

Hypothesis 7: The overall positive indirect effect of opportunity exploitation on efficiency (breakeven) is stronger than the overall indirect effect of opportunity discovery on efficiency (breakeven).

Hypothesis 8: The overall positive indirect effect of opportunity discovery on effectiveness (turnover) is stronger than the overall indirect effect of opportunity exploitation on effectiveness (turnover).

Given the above discussion, the hypothesized relationships are depicted in Figure 1 below.

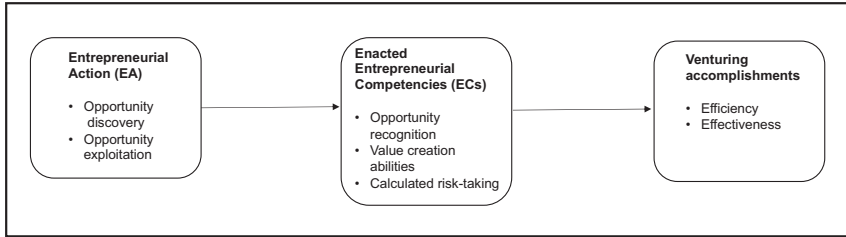


Figure 1: Hypothesized model.

3 Methods

3.1 Sampling Procedure

The model proposed in this study was investigated on a realized sample of 1150 entrepreneurs, consisting of 354 start-up and 796 established entrepreneurs in South Africa. Consistent with prior research, an entrepreneur is defined as an owner-manager of a business, with those being owner-managers for up to 3.5 years termed start-up, and those over 3.5 years termed established, entrepreneurs (Singer, Herrington, and Menipaz 2018; Turton and Herrington 2012). Data were obtained from a random sampling frame of 20,000 entrepreneurs, which was acquired from a South African-based market research firm. An online, self-administered survey questionnaire was emailed to the potential respondents, yielding a total of 1150 responses, reflecting a 5.75% response rate. 30% of respondents were female, while 60% were male. Furthermore, the respondents predominately operated around the economic hubs of South Africa, with 49% of respondents operating in the Gauteng province, 23% in the Western Cape, and 12% in Kwazulu-Natal. The respondent profile in terms of gender and location reflected a reasonably representative profile of South African small business owners based on prior data (Herrington, Kew, and Mwangi 2017). The respondents participated in a wide array of industries, with 25% operating in the business and financial services sector, 10% in telecommunications, 15% in manufacturing and construction, and 5% offering real-estate services. Forty-eight percent of respondents offered tangible products, 15.9% offered services only, while 36% offered both. Furthermore, respondents were well educated, with 41% having a post-graduate degree, 38% having some form of tertiary education, and 19% having a high school certificate. Finally, respondents age ranged from 18 to 83, with an average age of 51.5 years (standard deviation (SD) = 10.9 years).

4 Measures

4.1 Entrepreneurial Action Survey Development

Given the array of different typologies used to conceptualize EA, this paper focused on a discovery/exploitation typology which, to date, has been

suggested to be the most theoretically valuable (Davidsson 2018; Farmer, Yao, and Kung–Mcintyre 2011; Shane and Venkataraman 2000). To tap these constructs, the study used a 17-item scale capturing a range of gestational behaviors which have mostly been derived from the Panel Study of Entrepreneurial Dynamics (PSED) and the work of Carter, Gartner, and Reynolds (1996), as used by Farmer, Yao, and Kung–Mcintyre (2011). These items included, for example, identifying market opportunities, developing a business plan, and accessing funding assistance (refer to items for all substantive constructs in the Appendix). Building on the work of Farmer, Yao, and Kung–Mcintyre (2011) and Autio, Dahlander, and Frederiksen (2013), who assigned these various activities into the discovery or exploitation indices, this paper employed formative measures for these two constructs. For both constructs, respondents were asked the extent to which they had engaged in each of the particular activities in the past three years. Their responses were scored on a Likert scale from 1 (never) to 5 (very regularly), and responses were modeled as causal indicators of discovery or exploitation, using the formative approach to modeling within a CB-SEM framework as outlined by Diamantopoulos (2011).

Following Farmer, Yao, and Kung–Mcintyre (2011), discovery activities were defined as those which fall on “the conceptual side of new venture development”, ranging from early-stage venture idea generation and development activities such as thinking about the idea, identifying market opportunities, and evaluating the feasibility and desirability of the venture concept (Vogel 2017). Alternatively, exploitation activities were defined as the concrete behaviors undertaken to implement the venture idea. Such exploitation essentially deals with execution, structuring and resource orchestration behaviors (Mueller, Volery, and Von Siemens 2012).

4.2 Entrepreneurial Competencies Survey Development

In this paper ECs are represented by opportunity recognition, value creation, and calculated risk-taking. Consistent with other EC research (e.g., Kyndt and Baert 2015), since competencies can only be espoused through an individual’s concrete behaviors (Man, Lau, and Chan 2002), which are seen as the most proximal outcomes of knowledge and abilities (Bird, Schjoedt, and Baum 2012), the key three ECs are specifically operationalized through a behavioral lens using behavioral indicators. More specifically, the ECs were measured as separate latent constructs using the scales outlined by Morris et al. (2013). Each scale consisted of five, three, and five items respectively on a seven-point Likert-type scale ranging from 1 (strongly disagree) to 7 (strongly agree).

4.3 Venturing Accomplishments: Efficiency and Effectiveness Survey Development

Consistent with similar studies exploring entrepreneur characteristics (Delmar and Shane 2006; Yang and Danes 2015), efficiency and effectiveness venturing accomplishments were measured through the duration taken to achieve breakeven, and through the turnover generated. The sample of entrepreneurs provided the duration it took for their venture to reach the breakeven point, with a longer duration indicating less efficient operations (Yang and Danes 2015). They also provided the total revenue generated from their venture, with higher revenues indicating greater effectiveness. Similar measures have been used to explore venturing accomplishments in the past and have shown to have a close correlation to secondary sources of venture data (Murphy, Trailer, and Hill 1996; Podoyntsyna et al. 2013; Yang and Danes 2015).

4.4 Control Variables

Since the use of control variables is a contentious issue in entrepreneurship (Schjoedt and Bird 2014), and management research (Atinc, Simmering, and Kroll 2012; Spector and Brannick 2011), a prudent approach was taken and only controls which might have theoretical relevance were incorporated. In particular, the potentially confounding effects, as suggested by prior research, of self-efficacy (Baron, Mueller, and Wolfe 2016), prior business ownership experience (Delmar and Shane 2006), age (Jin et al. 2017), and industry (Eddleston and Kellermanns 2007) on venturing accomplishments were controlled for.

5 Results

Covariance-based structural equation modeling (CB-SEM) and confirmatory factor analysis (CFA) were employed to assess the validity and reliability of all latent constructs in this study (refer to Table 1 for descriptive statistics). Factor loadings for all items were greater than the recommended minimum value of 0.70 (Bagozzi and Yi 1988). Moreover, the square root of the Average Variance Extracted (AVE) and the Maximum Shared Variance (MSV) for each latent construct was considered. The AVE was above, while the MSV was below the factor correlations, suggesting satisfactory discriminant validity (Nunnally 1978). Furthermore, reliability, as assessed through composite reliability and Cronbach values, for each latent factor was above the recommended threshold

Table 1: Descriptive statistics and correlations for the main study variables.

	M	SD	Sk	K	1	2	3	4	5	6
1. Opportunity discovery	3.87	0.71	-0.624	0.492						
2. Opportunity exploitation	3.52	0.72	-0.595	0.406	0.663**					
3. Opportunity recognition	5.93	0.74	-0.831	1.261	0.265**	0.181**				
4. Value creation	5.51	0.93	-0.734	0.650	0.460**	0.392**	0.678			
5. Calculated risk-taking	5.05	1.19	-0.708	0.981	0.246**	0.239**	0.275**	0.669		
6. Breakeven	2.96	1.06	-0.448	-1.189	0.063*	0.124**	0.016	0.004	-0.047	
7. Turnover	2.44	1.40	0.644	-0.887	0.125**	0.259**	0.067*	0.073*	0.045	0.249**

Notes: M = mean, SD = standard deviation, Sk = skewness, K = kurtosis, Values in bold italics represent the square root of the AVE values.

* $p < 0.05$; ** $p < 0.01$ level (2-tailed).

of 0.70 (Fornell and Larcker 1981). Construct correlations and validity coefficients are summarized in Table 1. Since formative indicators need not be correlated, assessments of inter-item reliability and dimensionality are not appropriate for the opportunity discovery and exploitation constructs (Diamantopoulos and Papadopoulos 2010). Accordingly, validity is rather determined by the extensiveness of content coverage of the causal indicators, as well as the degree to which the construct fits within the nomological network as theorized (Diamantopoulos 2011). In this regard, the nomological network appeared to display relationships with these constructs as theorized, thus indicating construct validity.

5.1 Common Method Bias (CMB)

CMB occurs when characteristics of the measurement instrument cause systematic variance, or bias, in the theorized model which is attributed to common method effects rather than to the effects of the theorized constructs (Richardson, Simmering, and Sturman 2009). Since all substantive variables (i.e., independent, mediator, and dependent variables) in this study were collected at one point in time from the same respondents, recommendations by Podsakoff et al. (2003) were followed to limit, as well as assess the likelihood of CMB. More specifically, two procedures were employed, one *ex-ante*, the other *ex-post*. First, the instrument was carefully constructed with mediators, then outcome variables and independent variables in random order (Podsakoff et al. 2003). In addition to these preventative procedures, the unmeasured latent method factor technique was employed as an *ex-post* test of the possible effect of CMB. Specifically, a common method factor was introduced into the measurement model, allowing all items to load onto this additional factor. Item loadings and model fit were all substantively similar between this model and the original model. Therefore, it can be concluded that CMB is not a major concern in this paper (Podsakoff et al. 2003; Richardson et al. 2009). Additionally, the nature of the variables in this paper (i.e., actual behavior and objective performance measures) should further limit the risk of CMB and lend further support to the robustness of the results.

5.2 Structural Model Results

A central hypothesis of this paper's model is the notion that the ECs mediate the relationship between EA and venturing accomplishments in the form of efficiency and effectiveness of the venture. To test this model, the lavaan

package (version 0.6-3) (Rosseel 2012) was used in R to conduct CB-SEM using the maximum likelihood estimation method and the approach outlined by MacKinnon et al. (2002). This approach accommodates multiple mediators and enables the comparison of nested models for theory testing (Zhao, Lynch, and Chen 2010).

As depicted in Table 2, the conceptual model in this paper was tested and the model fit compared with a series of three nested models. These three nested models were alternative explanations for the data that differ from what this paper hypothesized and were compared to the theorized model as a robustness test following best practice recommendations in CB-SEM (Anderson, Wennberg, and McMullen 2019). Several fit indices were employed to assess the fit of these models: CFI, IFI, TLI values close to and above 0.9; Normed chi-square $\chi^2 / (df) < 3.00$; and RMSEA values between 0.08 and 0.05 indicated a reasonably good-fitting model, while RMSEA values below 0.05 represent an excellent fit (Weston and Gore 2006). Firstly, the hypothesized partial mediation model was tested and demonstrated good fit to the data ($\chi^2 (739) = 1923.423$, CFI = 0.918, TLI = 0.900, RMSEA = 0.037). Thereafter a variety of alternative models were tested. As alternative explanations, there is the possibility that the ECs fully mediate the EA-venturing accomplishments relationship, or that EA and the ECs independently effect venturing accomplishments. Therefore, Model 2 and 3 assess the fit of a full mediation model and direct effects model to the data respectively. In addition, there is the possibility that EA enhances performance outcomes which, as a form of feedback, in turn enhances EC development. Thus, Model 4 assessed the fit of an alternative causal path model to the data (i.e., switching mediators and dependent variables). However, based on the chi-square difference test, the hypothesized model fit the data significantly better than all alternative models. Therefore, initial support is found for the theorized model, allowing individual hypothesized paths to be assessed further.

Figure 2 summarizes the structural model results. Hypotheses 1 and 2 posited that opportunity discovery and exploitation behaviors are respectively positively related to EC development. Since all paths from these EA constructs to the ECs are positive and significant, support is found for these hypotheses. Hypothesis 3 argued that opportunity discovery is more strongly related to the development of opportunity recognition, value creation, and calculated risk-taking ECs than opportunity exploitation. Since all paths from opportunity discovery to the ECs are stronger than from opportunity exploitation to the ECs, support is found for this hypothesis.

In the next step, the indirect-effect hypotheses (i.e., Hypotheses 4 and 5) were analyzed by computing the unique indirect effects (UIE) of EA on breakeven and turnover through the ECs, using the more rigorous, non-parametric, bootstrap

Table 2: Alternative model comparison results.

Models	χ^2	df	χ^2/df	TLI	CFI	RMSEA	$n\chi^2$	n df	AIC
Model 1	1923.423	739		0.900	0.918	0.037			141127.017
Model 2	1992.198	743		0.896	0.914	0.038	68.775***	4	141187.793
Model 3	2019.207	733		0.891	0.911	0.039	95.784***	6	141234.801
Model 4	2407.010	743		0.861	0.855	0.044	483.587***	4	141602.605

* $p < 0.05$; ** $p < 0.01$; *** $p < 0.005$ (two-tailed).

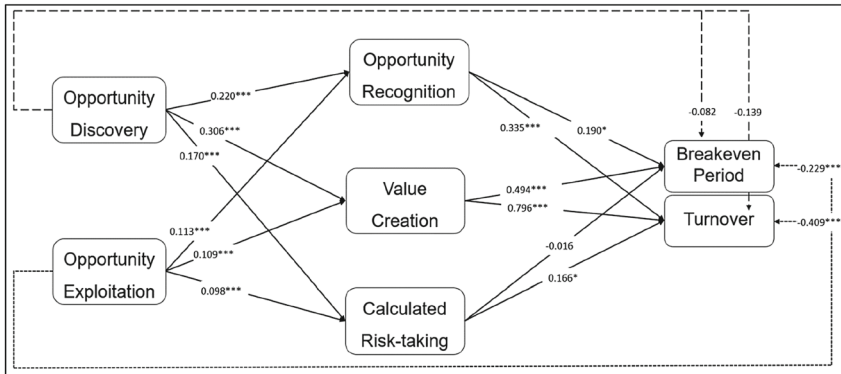
Notes:

Model 1: Hypothesized model: Partial mediation.

Model 2: Full mediation (entrepreneurial action → ECs → venturing accomplishments).

Model 3: Direct effects model (All indirect paths from entrepreneurial action to venturing accomplishments were removed).

Model 4: Alternative causal path model (entrepreneurial action → venturing accomplishments → ECs).



Controlled paths included in the model	Standardized coefficient
Ownership duration → Breakeven Period	0.003
Age → Breakeven Period	0.092***
Self-Efficacy → Breakeven Period	0.099
Operating industry → Breakeven Period	-0.057
Ownership duration → Turnover	0.004
Age → Turnover	0.061*
Self-Efficacy → Turnover	0.291***
Operating industry → Turnover	-0.149***

* $p < 0.05$; ** $p < 0.01$; *** $p < 0.005$

Notes: β = Standardized regression coefficient. Indirect paths are illustrated by solid lines while direct paths are dashed.

Figure 2: Summary of structural model results.

Table 3: Bootstrapped indirect effect estimates.

Hypothesized indirect effect	Path coefficient	LLCI	ULCI
Opportunity discovery → OR → Breakeven	0.042 [^]	0.019	0.442
Opportunity discovery → OR → Turnover	0.074 [*]	0.954	0.103
Opportunity discovery → VC → Breakeven	0.156 ^{**}	0.297	1.411
Opportunity discovery → VC → Turnover	0.251 ^{***}	0.839	2.842
Opportunity discovery → CRT → Breakeven	0.003	-0.080	0.147
Opportunity discovery → CRT → Turnover	0.028	0.008	0.454
Opportunity exploitation → OR → Breakeven	0.022 [^]	0.024	0.412
Opportunity exploitation → OR → Turnover	0.038 [*]	0.172	0.872
Opportunity exploitation → VC → Breakeven	0.054 ^{**}	0.200	0.942
Opportunity exploitation → VC → Turnover	0.086 ^{***}	0.560	1.828
Opportunity exploitation → CRT → Breakeven	0.002	-0.094	0.138
Opportunity exploitation → CRT → Turnover	0.016	0.018	0.428

Note: Based on two-tailed tests. Standardized coefficients reported; LLCI = lower level confidence interval; ULCI = upper level confidence interval.

[^] $p < 0.1$, ^{*} $p < 0.05$, ^{**} $p < 0.01$, ^{***} $p < 0.005$.

technique (MacKinnon et al. 2002). Bias-corrected confidence intervals using 5000 bootstrap samples were calculated with the 95% confidence intervals presented in Table 3.

As predicted in hypothesis 4, there is an overall positive indirect relationship between opportunity discovery and venturing accomplishments, mediated through the (a) opportunity recognition ($UIE_{Breakeven}, \beta = 0.042, p < 0.1$; $UIE_{Turnover}, \beta = 0.074, p < 0.05$), and (b) value creation ECs ($UIE_{Breakeven}, \beta = 0.156, p < 0.01$; $UIE_{Turnover}, \beta = 0.251, p < 0.005$). However, there was no overall positive indirect relationship between opportunity discovery and the venturing performance outcomes, mediated through the (c) calculated risk-taking ECs ($UIE_{Breakeven}, \beta = 0.003, p > 0.1$; $UIE_{Turnover}, \beta = 0.028, p > 0.1$).

Similarly, as predicted in hypothesis 5, there is an overall positive indirect relationship between opportunity exploitation and the venturing accomplishments, mediated through (a) opportunity recognition ($UIE_{Breakeven}, \beta = 0.022, p < 0.1$; $UIE_{Turnover}, \beta = 0.038, p < 0.05$), and (b) value creation ECs ($UIE_{Breakeven}, \beta = 0.054, p < 0.01$; $UIE_{Turnover}, \beta = 0.086, p < 0.005$). However, there was no overall positive indirect relationship between opportunity discovery and the venturing accomplishments, mediated through the (c) calculated risk-taking ECs ($UIE_{Breakeven}, \beta = 0.002, p > 0.1$; $UIE_{Turnover}, \beta = 0.016, p > 0.1$).

With regard the efficiency versus effectiveness hypotheses, since all the indirect paths are stronger for the turnover performance dimension than the breakeven dimension, support is found for the predictions of hypothesis 6.

Furthermore, since all the indirect paths from exploitation to the efficiency outcome of breakeven are stronger than they are for the indirect paths from discovery to breakeven, support is found for the predictions of hypothesis 7. Finally, support is found for hypothesis 8 because all the indirect paths from discovery to the effectiveness outcome of turnover are stronger than they are for the indirect paths from exploitation to turnover. Thus, overall, it seems that the effects of discovery and exploitation activities significantly differ, with the former being more important to EC development and achieving effective venturing accomplishment outcomes, while the latter is a stronger predictor of the achievement of efficient venturing accomplishment outcomes, a theme returned to in the discussion section.

6 Discussion

ECs have been identified as a core component of successful entrepreneurs (Mitchelmore and Rowley 2010). These specific abilities are argued as fueling the achievement of desired outcomes (Morris et al. 2013), in an environment where considerable challenges, setbacks, extreme uncertainty, information and resource scarcity, and rapid change are the norm (Baum and Locke 2004; van Gelderen 2012; van Gelderen, Kautonen, and Fink 2015). The notion of these seemingly heroic characteristics of entrepreneurs as a prerequisite to accomplishing certain desirable outcomes in entrepreneurial pursuits is relatively commonplace (c.f., Miller 2015). Additionally, there has been the rise of work which builds on this premise to explore how education interventions can assist EC development (Morris et al. 2013). However, while not arguing against the validity of this premise, perhaps a far more veridical, but less understood, possibility for the majority of entrepreneurs is that they simply “learn as they go” (Grégoire, Corbett, and McMullen 2011). In other words, for many entrepreneurs, ECs may be developed from the very experience of entrepreneurship itself. In addition, the channels through which EA influences venturing accomplishments remain unclear as few empirical studies have explored these mediating mechanisms (Mitchelmore and Rowley 2010). This paper takes a step toward filling these gaps by developing and empirically testing a model linking EA to two specific venturing accomplishments through three key ECs. Support is found for this model, the implications of which extend the field across multiple theoretical and practical avenues.

calculated risk-taking ECs, thus supporting Hypotheses 1 and 2. This finding thus aligns with the predictions of ST, that ECs are a result of learned scripts

developed through the interactions between an individual and their environment (Giddens 1984). Shepherd, Williams, and Patzelt (2015) argue that the very decision to pursue an entrepreneurial opportunity may impact on the abilities of the decision-maker, possibly through the feedback or information revealed by that decision. This paper indeed begins to provide empirical support for this notion.

Second, opportunity discovery is found to predict the three ECs more strongly than opportunity exploitation, thus supporting Hypothesis 3. While this paper only explores three ECs, consistent with previous theorizing, these ECs are arguably central to the distinct domain of entrepreneurship (e.g., McMullen and Shepherd 2006; Mitchell, Friga, and Mitchell 2005; Politis 2005). Since ECs related to recognizing opportunities, finding a way to create value from opportunities, and taking calculated risks to pursue opportunities, are more exploratory in nature (March 1991), opportunity discovery EAs play a stronger role in their development. This is in contrast to the more implementation oriented and resource orchestrating behaviors associated with opportunity exploitation EAs (Mueller, Volery, and Von Siemens 2012).

Third, support is found for the hypotheses 4 and 5 that the ECs mediate the effect of discovery and exploitation EAs on venturing accomplishments. Thus, empirical support is provided for the under-researched notion, as predicted by ST, that entrepreneurs earn their business advantage and venturing performance through the recognition, production, and modification of appropriate scripts, based on feedback from acting in a venturing context (Chiasson and Saunders 2005; Mitchelmore and Rowley 2010).

Finally, support is found for hypotheses 6–8, which make the distinction between efficiency versus effectiveness outcomes when investigating the impact of EA and ECs on venturing accomplishments. More specifically, in support of hypothesis 6, the ECs in this study appear more exploratory in nature and aimed at searching, innovating and risk-taking to provide effective solutions to customer problems (March 1991; Mueller, Volery, and Von Siemens 2012), hence demonstrating a stronger indirect effect on effectiveness (i.e., turnover) than efficiency (i.e., breakeven). Furthermore, consistent with the argument that opportunity discovery processes involve searching for the most (potentially) lucrative venture concept (Mueller, Volery, and Von Siemens 2012; Vogel 2017), while opportunity exploitation involves administrative and resource orchestrating behaviors (Mueller, Volery, and Von Siemens 2012) this paper finds support for hypothesis 7 and 8. Specifically, we confirm that discovery EAs strongly influence effectiveness indicators such as turnover, while exploitation EAs strongly affect efficiency indicators such as breakeven.

7 Conclusion

7.1 Contributions to Theory

By adopting an ST perspective (Giddens 1984), this paper extends theorizing by clarifying *how* EA influences ECs and venturing accomplishments. ST suggests that scripts are formed through feedback obtained by acting in a particular environment (Chiasson and Saunders 2005). The model in this paper affirms this assertion and identifies the discovery and exploitation of entrepreneurial opportunities (Shane and Venkataraman 2000), as key drivers of competent entrepreneurial behavior (ECs) and firm accomplishments. As a potent driver of feedback, this paper shows that the very experience of engaging in EA may spark the recognition, production, and modification of appropriate scripts which, ultimately, form the crux of business advantage (i.e., effectiveness) and efficiency (Chiasson and Saunders 2005). This is an important contribution, since it begins to help in resolving one of the central conundrums in entrepreneurial characteristic research, namely whether entrepreneurs have particular competencies and characteristics that attract them to entrepreneurship and lead to venturing performance outcomes and accomplishments, or whether EA results in the development of these characteristics (Grégoire, Corbett, and McMullen 2011). Notwithstanding the value of interventions to enhance ECs and encourage EA, this paper demonstrates that EA does in fact contribute to the development of three key ECs and, ultimately, venturing accomplishments. In fact, in an environment characterized by extreme uncertainty, rapid change, and information and resource scarcity (Baum and Locke 2004; van Gelderen 2012; van Gelderen, Kautonen, and Fink 2015), entrepreneurs have few established procedures or scripts for action (Stinchcombe 2000), with little initial information or feedback on which to base their decisions (Huang and Pearce 2015). Therefore, this paper demonstrates that a logic of action is highly appropriate in entrepreneurship, which is facilitated by the generation of the necessary feedback for the development of efficient and effective scripts for behavior (i.e., ECs).

Furthermore, scholars are beginning to recognize that most antecedents of venturing accomplishments have dual outcomes (i.e., both good and bad) (Busse, Mahlendorf, and Bode 2016), and that it is inappropriate to consider venturing success as a unidimensional construct, given that antecedents may be beneficial to one success metric, while being harmful to another metric (Murphy, Trailer, and Hill 1996). This paper contributes by demonstrating the empirical exploration of specific venturing accomplishments within an efficiency versus effectiveness framework. While there are several variables which could be considered potentially important venturing accomplishments

(Shepherd et al. 2019), all of which may be differently affected by EA and ECs (Politis 2005), this paper begins to develop nuanced insight within this domain upon which future research can build. This is a notable contribution, as this research provides important confirmation of EA's role in influencing EC's and specific venturing accomplishments while also, through an efficiency/effectiveness framework, allowing for a degree of theoretical extrapolation to other potential effectiveness/efficiency venturing accomplishments.

7.2 Implications for Practice

From a practice perspective, by demonstrating how engaging in the entrepreneurial process impacts on specific competencies and venturing outcomes, this paper has important implications for entrepreneurs as well as entrepreneurship education interventions in terms of the learning-by-doing and effectuation versus causation schools of thought (Chandler et al. 2011). Discovery and causation approaches assume that an individual must *ex ante*, possess the competencies, know-how and alertness to pursue a pre-defined business opportunity that exists in the market (Kirzner 1997; Wang and Chugh 2014). However, consistent with a more creationist stance (Alvarez and Barney 2007), this paper indicates that one need not possess key ECs to pursue an entrepreneurial career, as engagement in the process leads to the emergence of competencies and lucrative opportunities. That is, nascent and established entrepreneurs may be well advised to simply get started and act in the entrepreneurial context since, from this active approach, key competencies can be developed which lead to desired venturing accomplishments.

In addition, in contrast to the typical static views of ECs (Grégoire, Corbett, and McMullen 2011), by demonstrating how specific EAs lead to distinct outcomes, this paper provides a dynamic view of the ECs and venturing accomplishments and how they can be ameliorated. In particular, this paper shows that those seeking more effective, higher-turnover, venturing pursuits might be wise to regularly engage in the more exploratory opportunity discovery EAs, involving searching, planning, and conceptual development of one's venture concept (Vogel 2017). On the other hand, those seeking more efficient venturing operations should engage more in the administrative and resource orchestrating behaviors associated with opportunity exploitation (Mueller, Volery, and Von Siemens 2012).

These research implications extend to entrepreneurship education interventions and can serve as the impetus to ameliorate these programs. While more experiential approaches are gaining popularity in these programs, many interventions often take a more textbook, as opposed to a learning-by-doing approach (c.f., Brush and Noyes 2012) and aim to develop the "competencies

necessary for entrepreneurial action” (Morris et al. 2013, 352). This research proposes that highly action-oriented programs, where students engage with their target market, conduct market research and start their business could significantly improve learning outcomes, as appropriate scripts are formed through experience or feedback in the entrepreneurial context (Giddens 1984). Thus, this research lends further credence to the experiential and learning-by-doing schools which may support the advancement of pedagogical interventions which seek to enhance entrepreneurial outcomes.

7.3 Limitations and Future Research

There are important limitations of the present study that should be noted in weighing the results of this paper. First, the performance measures in this paper, while objective in nature, were self-reports and hence open to reporting bias. While the risk of such bias was minimized by seeking objective performance metrics and ensuring respondents’ anonymity, future research should seek to obtain measures of performance from alternative sources to the entrepreneur, such as company documents and colleagues in order to confirm the results. Second, future investigations would benefit from longitudinal and experimental designs, not only to clarify causal influence, but also to further rule out third-variable confounds (Anderson et al. 2019). While this study carefully explored the possibility of a variety of competing causal order models, the cross-sectional nature of the data does not allow us to fully rule out other model explanations (MacKinnon et al. 2002). In this regard, future research may particularly benefit from exploring ECs which predate EA, as well as those that proceed from EA, to more fully disentangle the drivers of EC development and differences in these ECs (Grégoire, Corbett, and McMullen 2011).

Finally, while this paper explores three ECs and two venturing accomplishments which are argued as central to the entrepreneurship domain, scholars have, nevertheless, noted a host of other ECs (e.g., Morris et al. 2013; Santos, Caetano, and Curral 2013), and venturing accomplishments (Shepherd et al. 2019), all of which cannot be examined within the scope of a single study and should rather be explored in future research. In particular, while it was found that opportunity discovery most strongly influences EC development, this is probably because this paper focused on ECs which are inherently tied to the development of the particular venture concept. Therefore, it may be the case that opportunity exploitation behaviors, which are more administrative in nature, rather than focused on the conceptual development of the idea, may be related to more administrative ECs, such as perseverance and the ability to structure and mobilize resources (Santos, Caetano, and Curral 2013).

Notwithstanding these limitations, this research provides a basis from which future research may explore these other ECs to come to a more holistic understanding of how EA influences EC development. Furthermore, many relevant questions could be pursued along these lines from a qualitative stance. From the standpoint of the research implications emerging in this paper, these questions could explore in more detail the lived experiences of entrepreneurs and how these experiences shaped their perceived ECs. Such investigations could fruitfully contribute towards greater insight into how interaction with the entrepreneurial context updates an entrepreneur's learned scripts.

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Appendix

Table 1: Construct measures and items.

Construct	Items
<i>Opportunity recognition</i>	
	I am always actively looking for new information.
	I often make novel connections and perceive new or emergent relationships between various pieces of information.
	I see links between seemingly unrelated pieces of information.
	I am good at “connecting dots”.
	I often see connections between previously unconnected domains of information.
<i>Value creation</i>	
	I am constantly asking questions to understand why products or services in my business underperform.
	I have a continuous flow of new business ideas that comes through observing the world.
	I regularly observe customers' use of our company's products and services to get new ideas.
	By paying attention to everyday experiences, I often get new business ideas.
	I frequently experiment to create new ways of doing things.
<i>Calculated risk-taking</i>	
	In a situation that presents itself as risky, I will take on the challenge.
	I am more of a risk manager than a risk avoider.
	I enjoy taking risks in my business.
<i>Discovery activities</i>	
	I have spent a lot of time thinking about starting a business before I actually started my business
	I have identified market opportunities
	I have prepared a business plan
	I have developed models or procedures for a product/service

Table 1: (continued)

Construct	Items
	I have selected a business name
	I am devoted full time to the business
<i>Exploitation activities</i>	
	I have organised a start-up team
	I have created a legal entity
	I have registered with the tax authorities
	I have invested some of my own money in a business
	I have requested for and received financial assistance to start my business
	I have facilities and equipment in place that assisted me in starting a business
	I have purchased or leased major items, like equipment, facilities, or property
	I have purchased raw materials, inventory, or other supply
	I have started marketing or promotional activities
	I have applied for licenses or patents
	I have appointed employees

References

- Alvarez, S. A., and J. B. Barney. 2007. "Discovery and Creation: Alternative Theories of Entrepreneurial Action." *Strategic Entrepreneurship Journal* 1 (1-2): 11–26.
- Anderson, B. S., Y. Eshima, and J. S. Hornsby. 2018. "Strategic Entrepreneurial Behaviors: Construct and Scale Development." *Strategic Entrepreneurship Journal* 13 (2), <https://doi.org/10.1002/sej.1306>.
- Anderson, B. S., W. Karl, and J. S. McMullen. 2019. "Enhancing Quantitative Theory-Testing Entrepreneurship Research." *Journal of Business Venturing* 34 (5): 105928.
- Atinc, G., M. J. Simmering, and M. J. Kroll. 2012. "Control Variable Use and Reporting in Macro and Micro Management Research." *Organizational Research Methods* 15 (1): 57–74.
- Auh, S., and B. Menguc. 2005. "Balancing Exploration and Exploitation: The Moderating Role of Competitive Intensity." *Journal of Business Research* 58 (12): 1652–61, <http://www.sciencedirect.com/science/article/pii/S0148296305000329>.
- Autio, E., L. Dahlander, and L. Frederiksen. 2013. "Information Exposure, Opportunity Evaluation, and Entrepreneurial Action: An Investigation of an Online User Community." *Academy of Management Journal* 56 (5): 1348–71.
- Bagozzi, R. P. 2011. "Measurement and Meaning in Information Systems and Organizational Research: Methodological and Philosophical Foundations." *MIS Quarterly* 35 (2): 261–92.
- Bagozzi, R. P., and Y. Yi. 1988. "On the Evaluation of Structural Equation Models." *Journal of the Academy of Marketing Science* 16 (1): 74–94.
- Baron, R. A., B. A. Mueller, and M. T. Wolfe. 2016. "Self-efficacy and Entrepreneurs' Adoption of Unattainable Goals: The Restraining Effects of Self-Control." *Journal of Business Venturing* 31 (1): 55–71.
- Baum, J. R., and E. A. Locke. 2004. "The Relationship of Entrepreneurial Traits, Skill, and Motivation to Subsequent Venture Growth." *Journal of Applied Psychology* 89 (4): 587.

- Bird, B. 1995. "Toward a Theory of Entrepreneurial Competency." In *Seminal Ideas for the Next Twenty-Five Years of Advances*, edited by J. A. Katz, and A. C. Corbet, 115–31. Bingley, UK: Emerald.
- Bird, B., S. Leon, and J Robert Baum. 2012. "Editor's Introduction. Entrepreneurs' Behavior: Elucidation and Measurement." *Entrepreneurship Theory and Practice* 36 (5): 889–913.
- Bliemel, M. J.. 2014. "Getting Entrepreneurship Education Out of the Classroom and into Students' Heads." *Entrepreneurship Research Journal* 4 (2): 237–60.
- Brush, C., and E. Noyes. 2012. "Teaching Entrepreneurial Action: Application of Creative Logic." In *Entrepreneurial Action*, edited by A. C. Corbett, and A. K. Jarome, 253–80. Bingley, UK: Emerald.
- Busse, C., M. D. Mahlendorf, and C. Bode. 2016. "The ABC for Studying the Too-Much-Of-a-Good-Thing Effect: A Competitive Mediation Framework Linking Antecedents, Benefits, and Costs." *Organizational Research Methods* 19 (1): 131–53.
- Carter, N. M., W. B Gartner, and P. D. Reynolds. 1996. "Exploring Start-Up Event Sequences." *Journal of Business Venturing* 11 (3): 151–66.
- Chandler, G. N., D. R. DeTienne, M. Alexander, and V. M. Troy. 2011. "Causation and Effectuation Processes: A Validation Study." *Journal of Business Venturing* 26 (3): 375–90.
- Chen, H. S., R. K. Mitchell, K. H. Brigham, R. Howell, and R. Steinbauer. 2018. "Perceived Psychological Distance, Construal Processes, and Abstractness of Entrepreneurial Action." *Journal of Business Venturing* 33 (3): 296–314.
- Chiasson, M., and C. Saunders. 2005. "Reconciling Diverse Approaches to Opportunity Research Using the Structuration Theory." *Journal of Business Venturing* 20 (6): 747–67.
- Clarysse, B., J. Bruneel, and M. Wright. 2011. "Explaining Growth Paths of Young Technology-Based Firms: Structuring Resource Portfolios in Different Competitive Environments." *Strategic Entrepreneurship Journal* 5 (2): 137–57.
- Davidsson, P. 2018. *Researching Entrepreneurship: Conceptualization and Design*. New York, NY: Springer.
- Davis, P. S., and L. P. Timothy. 2002. "Measuring Organizational Efficiency and Effectiveness." *Journal of Management Research* 2 (2): 87–97. <https://search-proquest-com.uplib.idm.oclc.org/docview/237233271/fulltextPDF/120F3B4A80D8432DPQ/1?accountid=14717>.
- Delanoë-Gueguen, S., and A. Fayolle. 2018. "Crossing the Entrepreneurial Rubicon: A Longitudinal Investigation." *Journal of Small Business Management* 57 (3): 1044–65.
- Delmar, F., and S. Scott. 2006. "Does Experience Matter? The Effect of Founding Team Experience on the Survival and Sales of Newly Founded Ventures." *Strategic Organization* 4 (3): 215–47.
- Diamantopoulos, A. 2011. "Incorporating Formative Measures into Covariance-Based Structural Equation Models." *Mis Quarterly* 35 (2): 335–58.
- Diamantopoulos, A., and N. Papadopoulos. 2010. "Assessing the Cross-National Invariance of Formative Measures: Guidelines for International Business Researchers." *Journal of International Business Studies* 41 (2): 360–70.
- Dyer, J. H., H. B Gregersen, and C. Christensen. 2008. "Entrepreneur Behaviors, Opportunity Recognition, and the Origins of Innovative Ventures." *Strategic Entrepreneurship Journal* 2 (4): 317–38.
- Eddleston, K. A., and F. W. Kellermanns. 2007. "Destructive and Productive Family Relationships: A Stewardship Theory Perspective." *Journal of Business Venturing* 22 (4): 545–65.
- Farmer, S. M., X. Yao, and K. Kung-Mcintyre. 2011. "The Behavioral Impact of Entrepreneur Identity Aspiration and Prior Entrepreneurial Experience." *Entrepreneurship Theory and Practice* 35 (2): 245–73.

- Fornell, C., and D. F. Larcker. 1981. "Evaluating Structural Equation Models with Unobservable Variables and Measurement Error." *Journal of Marketing Research* 18 (1): 39–50.
- Giddens, A. 1984. *The Constitution of Society*. Berkeley, CA: University of California Press.
- Grégoire, D. A., A. C. Corbett, and J. S. McMullen. 2011. "The Cognitive Perspective in Entrepreneurship: An Agenda for Future Research." *Journal of Management Studies* 48 (6): 1443–77.
- Herrington, M., P. Kew, and A. Mwanga. 2017. *South Africa Report 2016/2017: Can Small Businesses Survive in South Africa*. University of Cape Town. Cape Town: Global Entrepreneurship Monitor, <http://gemconsortium.org/report/49833>.
- Herron, L., and R. B. Robinson. 1993. "A Structural Model of the Effects of Entrepreneurial Characteristics on Venture Performance." *Journal Of Business Venturing* 8 (3): 281–94.
- Huang, L., and J. L. Pearce. 2015. "Managing the Unknowable: The Effectiveness of Early-Stage Investor Gut Feel in Entrepreneurial Investment Decisions." *Administrative Science Quarterly* 60 (4): 634–70.
- Jin, L., K. Madison, D. K. Nils, F. W. Kellermanns, T. R. Crook, and X. Jing. 2017. "Entrepreneurial Team Composition Characteristics and New Venture Performance: A Meta-Analysis." *Entrepreneurship Theory and Practice* 41 (5): 743–71.
- Kirzner, I. M. 1997. "Entrepreneurial Discovery and the Competitive Market Process: An Austrian Approach." *Journal of Economic Literature* 35 (1): 60–85. <https://search-proquest-com.uplib.idm.oclc.org/docview/213241858/fulltextPDF/5C73EE7F444B4BC5PQ/7?accountid=14717>.
- Knight, F. H. 2012. *Risk, Uncertainty and Profit*. Courier Corporation.
- Kyndt, E., and B. Herman. 2015. "Entrepreneurial Competencies: Assessment and Predictive Value for Entrepreneurship." *Journal of Vocational Behavior* 90: 13–25.
- Lepak, D. P., K. G. Smith, and M. S. Taylor. 2007. "Value Creation and Value Capture: A Multilevel Perspective." *Academy of Management Review* 32 (1): 180–94.
- Lerner, D., R. Hunt, and I. Verheul. 2018. "Dueling Banjos: Harmony and Discord between ADHD and Entrepreneurship." *Academy of Management Perspectives* 32 (2): 266–86.
- Lichtenstein, B. B., N. M. Carter, K. J. Dooley, and W. B. Gartner. 2007. "Complexity Dynamics of Nascent Entrepreneurship." *Journal of Business Venturing* 22 (2): 236–61.
- Longenecker, J. G., J. W. Petty, L. E. Palich, and F. Hoy. 2013. *Small Business Management: Launching & Growing Entrepreneurial Ventures*. Stamford, ST: Cengage Learning.
- MacKinnon, D. P., C. M. Lockwood, J. M. Hoffman, S. G. West, and V. Sheets. 2002. "A Comparison of Methods to Test Mediation and Other Intervening Variable Effects." *Psychological Methods* 7 (1): 83.
- Mamabolo, M. A., M. Kerrin, and K. Tumo. 2017. "Entrepreneurship Management Skills Requirements in an Emerging Economy: A South African Outlook." *The Southern African Journal of Entrepreneurship and Small Business Management* 9 (1), <http://sajesbm.co.za/index.php/sajesbm/article/view/111/78>.
- Man, T. W. Y, T. Lau, and K. F. Chan. 2002. "The Competitiveness of Small and Medium Enterprises: A Conceptualization with Focus on Entrepreneurial Competencies." *Journal of Business Venturing* 17 (2): 123–42.
- March, J. G. 1991. "Exploration and Exploitation in Organizational Learning." *Organization Science* 2 (1): 71–87.
- McMullen, J. S., and D. A. Shepherd. 2006. "Entrepreneurial Action and the Role of Uncertainty in the Theory of the Entrepreneur." *The Academy of Management Review* 31 (1): 132–52.

- Middleton, K. W., and A. Donnellon. 2014. "Personalizing Entrepreneurial Learning: A Pedagogy for Facilitating the Know Why." *Entrepreneurship Research Journal* 4 (2): 167–204.
- Miller, D. 2015. "A Downside to the Entrepreneurial Personality?" *Entrepreneurship Theory and Practice* 39 (1): 1–8.
- Mitchell, J. R., P. N. Friga, and R. K. Mitchell. 2005. "Untangling the Intuition Mess: Intuition as a Construct in Entrepreneurship Research." *Entrepreneurship Theory and Practice* 29 (6): 653–79.
- Mitchelmore, S., and J. Rowley. 2010. "Entrepreneurial Competencies: A Literature Review and Development Agenda." *International Journal of Entrepreneurial Behavior & Research* 16 (2): 92–111.
- Morris, M. H., J. W. Webb, J. Fu, and S. Singhal. 2013. "A Competency-Based Perspective on Entrepreneurship Education: Conceptual and Empirical Insights." *Journal of Small Business Management* 51 (3): 352–69.
- Mueller, S., T. Volery, and B. Von Siemens. 2012. "What Do Entrepreneurs Actually Do? an Observational Study of Entrepreneurs' Everyday Behavior in the Start-Up and Growth Stages." *Entrepreneurship Theory and Practice* 36 (5): 995–1017.
- Mulder, M., T. Lans, J. Versteegen, H. Biemans, and Y. Meijer. 2007. "Competence Development of Entrepreneurs in Innovative Horticulture." *Journal of Workplace Learning* 19 (1): 32–44.
- Murphy, G. B., J. W. Trailer, and R. C. Hill. 1996. "Measuring Performance in Entrepreneurship Research." *Journal of Business Research* 36 (1): 15–23.
- Nunnally, J. C. 1978. *Psychometric Theory*, 2nd ed. New York, NY: McGraw-Hill.
- Obschonka, M., and M. Stuetzer. 2017. "Integrating Psychological Approaches to Entrepreneurship: the Entrepreneurial Personality System (EPS)." *Small Business Economics* 49 (1): 203–31.
- Podoyntsyna, K., M. Song, H. van der Bij, and M. Weggeman. 2013. "Improving New Technology Venture Performance under Direct and Indirect Network Externality Conditions." *Journal of Business Venturing* 28 (2): 195–210.
- Podsakoff, P. M., B. M. Scott, J. Y. Lee, and N. P. Podsakoff. 2003. "Common Method Biases in Behavioral Research: A Critical Review of the Literature and Recommended Remedies." *Journal of Applied Psychology* 88 (5): 879.
- Politis, D. 2005. "The Process of Entrepreneurial Learning: A Conceptual Framework." *Entrepreneurship Theory and Practice* 29 (4): 399–424.
- Richardson, H. A., M. J. Simmering, and M. C. Sturman. 2009. "A Tale of Three Perspectives: Examining Post Hoc Statistical Techniques for Detection and Correction of Common Method Variance." *Organizational Research Methods* 12 (4): 762–800.
- Rosseel, Y. 2012. "Lavaan: An R Package for Structural Equation Modeling and More. Version 0.5–12 (BETA)." *Journal of Statistical Software* 48 (2): 1–36.
- Santos, S. C., A. Caetano, and L. Curral. 2013. "Psychosocial Aspects of Entrepreneurial Potential." *Journal of Small Business and Entrepreneurship* 26 (6): 661–85.
- Schjoedt, L., and B. Bird. 2014. "Control Variables: Use, Misuse and Recommended Use." In *Handbook of Research Methods and Applications in Entrepreneurship and Small Business*, 136–55.
- Scott, M., and R. Bruce. 1987. "Five Stages of Growth in Small Business." *Long Range Planning* 20 (3): 45–52.
- Shane, S., and S. Venkataraman. 2000. "The Promise of Entrepreneurship as a Field of Research." *The Academy of Management Review* 25 (1): 217–26.

- Shepherd, D. A., T. A. Williams, and H. Patzelt. 2015. "Thinking about Entrepreneurial Decision Making: Review and Research Agenda." *Journal of Management* 41 (1): 11–46.
- Shepherd, D. A., W. Karl, S. Roy, and J. Wiklund. 2019. "What Are We Explaining: A Review and Agenda on Initiating, Engaging, Performing, and Contextualizing Entrepreneurship." *Journal of Management* 45 (1): 159–96.
- Singer, S., M. Herrington, and E. Menipaz. 2018. Global Entrepreneurship Monitor: Global Report 2017/2018. (Global Entrepreneurship Research Association). <https://www.gemconsortium.org/report/50012>.
- Spector, P. E., and M. T. Brannick. 2011. "Methodological Urban Legends: The Misuse of Statistical Control Variables." *Organizational Research Methods* 14 (2): 287–305.
- Stinchcombe, A. L. 2000. "Social Structure and Organizations." In *Economics Meets Sociology in Strategic Management*, 229–59. Emerald Group.
- Townsend, D. M., R. A. Hunt, J. S. McMullen, and S. D. Sarasvathy. 2018. "Uncertainty, Knowledge Problems, and Entrepreneurial Action." *Academy of Management Annals* 12 (2): 659–87.
- Turton, N., and M. Herrington. 2012. "Global Entrepreneurship Monitor 2012 South Africa", Online at <https://www.gemconsortium.org/docs/download/2801> (accessed November 6, 2013).
- Vahidnia, H., H. Shawna, J. Chen, M. Robert, and R. K. Mitchell. 2017. *Entrepreneurial Action Research: Moving beyond Fixed Conceptualizations*, 38–59: The SAGE Handbook of Small Business and Entrepreneurship.
- Van Gelderen, M. 2012. "Perseverance Strategies of Enterprising Individuals." *International Journal of Entrepreneurial Behavior & Research* 18 (6): 630–48.
- Van Gelderen, M., T. Kautonen, and M. Fink. 2015. "From Entrepreneurial Intentions to Actions: Self-Control and Action-Related Doubt, Fear, and Aversion." *Journal of Business Venturing* 30 (5): 655–73, <http://www.sciencedirect.com/science/article/pii/S0883902615000142>.
- Venkataraman, S., S. D. Sarasvathy, N. Dew, and W. R. Forster. 2012. "Reflections on the 2010 AMR Decade Award: Whither the Promise? Moving Forward with Entrepreneurship as a Science of the Artificial." *Academy of Management Review* 37 (1): 21–33.
- Vogel, P. 2017. "From Venture Idea to Venture Opportunity." *Entrepreneurship Theory and Practice* 41 (6): 943–71.
- Wach, D., U. Stephan, J. G. Marjan, and J. Wegge. 2020. "Entrepreneurs' Achieved Success: Developing a Multi-Faceted Measure." *International Entrepreneurship and Management Journal* 16 (3): 1123–51.
- Wang, C. L., and H. Chugh. 2014. "Entrepreneurial Learning: Past Research and Future Challenges." *International Journal of Management Reviews* 16 (1): 24–61.
- Weston, R., and P. A. Gore. 2006. "A Brief Guide to Structural Equation Modeling." *The Counseling Psychologist* 34 (5): 719–51.
- Wiklund, J., H. Patzelt, and D. Dimov. 2016. "Entrepreneurship and Psychological Disorders: How ADHD Can Be Productively Harnessed." *Journal of Business Venturing Insights* 6: 14–20.
- Yang, Y., and S. M. Danes. 2015. "Resiliency and Resilience Process of Entrepreneurs in New Venture Creation." *Entrepreneurship Research Journal* 5 (1): 1–30.
- Zhao, X., J. G. Lynch, and Q. Chen. 2010. "Reconsidering Baron and Kenny: Myths and Truths about Mediation Analysis." *Journal of Consumer Research* 37 (2): 197–206.