



Uncertain but able: Entrepreneurial self-efficacy and novices' use of expert decision-logic under uncertainty



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ARTICLE INFO

Available online 16 October 2014

Keywords:

Effectuation
Entrepreneurial self-efficacy
Opportunity
Uncertainty
Experiment

ABSTRACT

Entrepreneurs' initial strategy choices are made in the face of inherently uncertain and fundamentally unpredictable futures. Yet, unlike experts, novice entrepreneurs still tend to rely on predictions and forecasts as they move their ideas through the venture creation process. This study examines the role of entrepreneurial self-efficacy (ESE) and situational framing in mitigating the seemingly negative consequences of an "experience deficit" and promoting the use of effectuation - a non-predictive logic associated with entrepreneurial expertise. The results of a randomized experiment show that, in contrast to a control group and a low ESE group, novices who experienced an increase in ESE were more likely to use effectuation under uncertainty. This relationship was mediated by the framing of the situation as an opportunity.

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1. Introduction

Entrepreneurs' initial decisions are made in the face of uncertainty, which renders predictive decision-strategies as largely inadequate (Alvarez and Barney, 2007; Brinckmann et al., 2010; Miller, 2007; Wiltbank et al., 2006). Against this backdrop, 'effectuation' – a non-predictive logic used by expert entrepreneurs – is positioned as a viable alternative (Sarasvathy, 2001). Effectual logic does not require foresight but is rather concerned with directly shaping only those elements of the future currently within one's control (Sarasvathy, 2001; Wiltbank et al., 2006). By converging on a specific set of heuristics effectuation research is now starting to flesh out the logic's implications for the entrepreneurial process (Read et al., 2009; Sarasvathy, 2008). Yet, despite the rapidly growing volume of scholarship devoted to effectuation (Perry et al., 2011), research on its antecedents remains limited in scope.

Prior work found that, unlike novices, highly experienced entrepreneurs unequivocally rely on effectuation (Dew et al., 2009). The central assumption in interpreting these findings is that the development of expertise in starting new ventures leads to important changes in how individuals make decisions (Dew et al., 2009). However, this assumption was never directly tested and research to date falls short in rejecting alternatives to experience-based explanations (Baron, 2009). In light of recent studies documenting the use of effectuation by complete novices (e.g., Brettel et al., 2012; Chandler et al., 2011), it is evident that theory still does not adequately explain why entrepreneurs, confronted with identical conditions, vary in their reliance on effectuation?

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We offer a new perspective to explain this question by purposively attending to the other side of the “experience coin” – that is, the study of inexperienced entrepreneurs (e.g., Haynie et al., 2010). This setting represents a highly relevant, if understudied, empirical context and allows us to complement prior research while avoiding the conflation of other explanatory constructs with entrepreneurial experience. Using these boundary conditions as a starting point, we focus our investigation on the role of entrepreneurial self-efficacy (ESE) – a single construct that has not only been shown to impact entrepreneurial decision-making more generally (Chen et al., 1998; Hmieleski and Baron, 2008) but has also been overlooked in prior effectuation research.

2. ESE and effectuation: uncertainty as opportunity

Rooted in social cognitive theory (Bandura, 1997), ESE reflects the strengths of one’s confidence in the ability to perform entrepreneurial-tasks (Chen et al., 1998). Importantly, even when lacking any prior experience, individuals may be highly confident (Camerer and Lovallo, 1999; Townsend et al., 2010) and entrepreneurial decisions are often attributed to such (over)confidence in ability (Hayward et al., 2006; Koellinger et al., 2007; Wu and Knott, 2006). These features position ESE as an important antecedent of decision-making in general, but also as a common factor that may be shared by experts and novices alike. Moreover, ESE stimulates heuristic thinking and propagates the belief in the ability to directly shape the environment (Busenitz and Barney, 1997; Wood and Bandura, 1989). Hence, to the extent that effectual logic operates by playing down predictive information but in the same time utilizing proactiveness, agency, and control, ESE is a likely predictor (Sarasvathy and Dew, 2008).

Into that context, we piece together Dutton and Jackson’s (1987) work on situational framing to better understand how the same uncertain situation may be interpreted through different lenses, thereby evoking different strategic responses. When approaching decision-problems entrepreneurs convert the information they face into meaningful pictures through the imposition of simplified categories such as “opportunity” and “threat” (Dutton and Jackson, 1987). Unlike threats, opportunities carry positive meaning, and are associated with feelings of control (Jackson and Dutton, 1988). These salient characteristics of the opportunity frame provide the theoretical justification linking it to both ESE and effectuation (Gartner et al., 2008; Krueger and Dickson, 1994; Wiltbank et al., 2006). Simply put, when individuals feel confident about their entrepreneurial ability they are more likely to frame an uncertain environment as an opportunity and thus rely on effectual logic in their decisions. Fig. 1 summarizes our hypotheses.

3. Method

3.1. Participants and design

We conducted a randomized controlled experiment with a three-group between-participant design (Low ESE vs. High ESE vs. Control group). The sample consisted of 93 business students at a Dutch university (57 females and 36 males; $M_{\text{age}}=23.80$, $SD_{\text{age}}=1.61$) who indicated having no prior entrepreneurial experience.

3.2. Procedure and materials

An initial questionnaire was used to check whether participants’ scores on relevant variables (e.g., demographics, ESE, meta-cognition, risk-propensity) were identical coming in to the study – that is, whether randomization was successful. Moreover, it served as the vehicle to carry out our experimental manipulation. Next, participants were randomly assigned to receive (bogus) feedback about their entrepreneurial ability. The feedback received was said to have been derived from the scoring of the answers given so far (e.g., Gatewood et al., 2003). Participants in the control group received no feedback. As a manipulation check, ESE was measured again. Next, all participants were instructed to read through a scenario involving the launch of a new venture in which they were to assume the role of the entrepreneur and answer questions about their

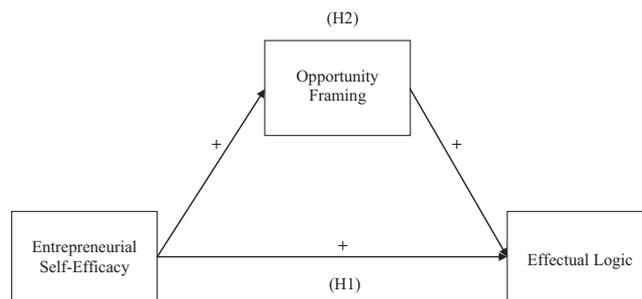


Fig. 1. Conceptual model.

perception of state uncertainty in this situation, their perception of the situation as an opportunity and threat, and their decision-making logic in completing a series of venturing tasks. Finally, participants were debriefed.

3.3. Measures¹

3.3.1. Venture scenario, state uncertainty and effectual logic²

Before answering the decision-making items participants were first presented with a realistic venture scenario. Developed specifically for the current study, this scenario was embedded with McKelvie et al.'s (2011, p. 288) specific operationalizations of state uncertainty. Respondents' perception of state uncertainty was then checked using a 4-item scale by Ashill and Jobber (2010, $\alpha=0.88$).

Effectual logic was measured with 14 items (Murnieks et al., 2011; Wiltbank et al., 2009). Six items measured reliance on predictive logic ($\alpha=0.87$) and eight items measured reliance on non-predictive logic ($\alpha=0.91$). For our analysis and consistent with Murnieks et al. (2011) we operationalized the variable "effectual logic" as the distance between respondents' non-predictive and predictive mean scores, where larger positive scores denote stronger preferences for effectuation (negative for causation).

3.3.2. Opportunity framing

We operationalized opportunity framing by combining two items from Mohammed and Billings (2002) with higher scores reflecting an opportunity framing and lower scores reflecting threat framing ($\alpha=0.77$).

3.3.3. Manipulation-check and control variables

As a manipulation check we used a self-developed five-item scale of ESE ($\alpha=0.93$). Baseline ESE was measured using Forbes (2005) 15-item scale ($\alpha=0.92$). Meta-cognitive experience ($\alpha=0.80$) and meta-cognitive knowledge ($\alpha=0.87$) were measured using Haynie and Shepherds' (2009) scales. Risk propensity was measured with Mullins and Forlani's (2005) scale.

4. Results

4.1. Preliminary analysis

Table 1 presents the means, standard deviations (per group), and correlations. A multivariate analysis of variance (using Pillai's trace), with condition as the independent variable and all control variables as dependent variables, showed no significant multivariate effects, $V=0.19$, $F(12, 172)=1.56$, $p=0.107$, but there was a univariate effect on age, $F(2, 90)=3.29$, $p=0.042$. We can therefore conclude that randomization into the experimental conditions was successful, with the exception of age.

The manipulation was successful in inducing high ESE. ANOVA showed a significant effect of condition on the manipulation check, $F(2, 90)=38.95$, $p<0.001$. High ESE group participants were significantly more certain of their entrepreneurial abilities than Low ESE and control group participants. No differences were found between the low ESE group and the control group, rendering the negative induction of ESE as unsuccessful. Additionally, as intended, participants across all conditions perceived the environment in the venture scenario as highly uncertain ($M=4.15$), $F(2, 90)=0.004$, $p=.996$.

4.2. Hypotheses testing

4.2.1. ESE and effectual logic

ANOVA showed a significant effect of condition on effectual logic, $F(2, 87)=36.72$, $p<0.001$. Simple contrast analyses showed that participants with high ESE were more likely to apply effectual logic than participants with low ESE, $t(87)=-6.81$, $p<0.001$ or participants in the control group, $t(87)=-7.91$, $p<0.001$. No differences in preference for effectual logic were found between the low ESE and the control group, $t(87)=1.10$, $p=0.276$ (see Fig. 2).

4.2.2. Opportunity framing as a mediator

We applied Hayes and Preacher's (2013) MEDIANTE macro for SPSS, which allows for a multicategorical independent variable (5000 bootstrap resamples). The high ESE group was chosen as reference because participants' responses were consistently different from the responses of the low ESE and the control group in all previous analyses. The findings show that (1) respondents in the high ESE group were more likely to frame the situation as an opportunity than respondents in the control group or in the low ESE group, (2) when framing situations as an opportunity, individuals are more likely to prefer effectual logic in their entrepreneurial decision-making, and (3) respondents in the high ESE group were more likely

¹ Unless otherwise indicated, all measures were anchored on 5-point Likert scales ranging from 1 (*strongly disagree*) to 5 (*strongly agree*).

² The venturing scenario and the decision-making questionnaire are available from the authors upon request.

Table 1

Means, standard deviations, and correlations of measured variables.

Variables	Low ESE n=31		Control n=31		High ESE n=31		1	2	3	4	5	6	7	8	9	10	
	M	SD	M	SD	M	SD											
1 Age	24.39	1.87	23.55	1.23	23.45	1.57	-										
2 Sex (male=1; female=2)	1.68	0.48	1.48	0.51	1.68	0.48	-0.16	-									
3 Risk taking propensity	1.87	1.46	2.07	1.55	2.19	1.28	0.18	-0.26*	-								
4 Meta-cognitive knowledge	3.73	0.67	3.46	0.60	3.51	0.58	0.04	0.33**	-0.06	-							
5 Meta-cognitive experience	3.55	0.69	3.29	0.59	3.51	0.66	-0.02	0.27**	-0.08	0.83***	-						
6 ESE (Baseline)	2.01	0.70	1.98	0.71	2.11	0.72	0.04	0.02	0.05	0.09	0.23*	-					
7 ESE (Manipulation check)	1.90	1.06	1.89	0.81	3.54	0.61	-0.02	-0.03	0.15	0.02	0.14	0.46***	-				
8 Perceived state uncertainty	4.16	0.76	4.15	0.84	4.15	0.53	0.18	-0.11	0.25*	-0.13	-0.15	-0.32**	-0.11	-			
9 Opportunity framing	2.60	0.91	2.50	0.53	3.74	0.87	-0.09	0.15	0.03	0	0.02	-0.04	0.58***	-0.05	-		
10 Effectual logic	-1.12	1.28	-1.40	0.81	0.59	0.81	-0.05	0.16	0.08	0.09	0.16	0.06	0.63***	-0.02	0.54***	-	

Note: Total $n=93$. * $p < 0.05$. ** $p < 0.01$. *** $p < 0.001$.

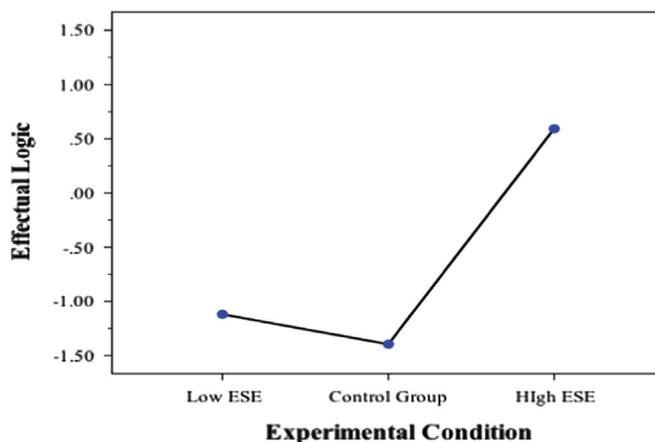


Fig. 2. Main effect of experimental condition on preference for effectual logic.

to use effectual logic than respondents in the control group or the low ESE group (see Fig. 3). Finally, (4) the indirect effects of ESE predicting effectual logic through opportunity framing was significant (high ESE vs. control: 95% CI=[0.02, 0.79]; high ESE vs. low ESE: 95% CI=[0.01, 0.70]). Overall, the results provide support for the conclusion that novices higher on ESE, compared with a control group and with the low ESE group, used effectual logic to a larger extent, and that this was as a consequence of their framing an uncertain situation as an opportunity.

5. Discussion

Already in the late 1800s William James famously proposed that “If you want a quality, act as if you already had it.” Similarly, the primary objective of this study was to investigate whether inexperienced entrepreneurs can apply an expert decision-logic solely as a consequence of feeling more confident about their entrepreneurial abilities. At the outset, our findings are consistent with prior research showing that, on average, novice entrepreneurs use predictive logic in an attempt to foresee future events, even if these events are utterly unpredictable (e.g., Dew et al., 2009). However, we point to the critical role of ESE, regardless of either actual ability or experience, in propelling novices away from their default response and switching to effectual logic. Notably, our results highlight the multidimensionality of the uncertainty construct, as changes in ESE were independent from evaluations of state uncertainty (Hayward et al., 2006; McKelvie et al., 2011;

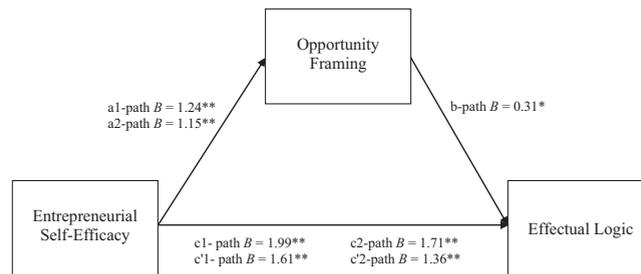


Fig. 3. Mediation model showing the effects of entrepreneurial self-efficacy on effectual logic as mediated by the framing of the situation as an opportunity. Paths marked with the suffix 1 indicate the comparison of High ESE with Control, and paths marked with a suffix 2 indicate the comparison of high ESE with low ESE (see Hayes and Preacher, 2013, for a full description of this analytic strategy for testing mediation with a multicategorical predictor). All values are unstandardized coefficients. Asterisks show significant paths (* $p < 0.05$, ** $p < 0.001$).

Milliken, 1987). In addition, we provide support for studies showing how efficacy beliefs influence situational framing (Krueger and Dickson, 1994; Mohammed and Billings, 2002; Wood and Bandura, 1989), and how these projections of the self drive entrepreneurial decisions and actions (Dutton and Jackson, 1987; Gartner et al., 2008).

We identify our main contribution in showing that effectual logic, which was originally hyped as an expert decision-logic (Sarvasathy, 2008), can also, perhaps more mundanely, stem from an increase in ESE. These findings may begin to resolve an existing tension in the literature, namely; whether effectuation is a distinct feature of expert thinking or if it is merely a constituent of human reasoning more generally (Baron, 2009; Dew et al., 2009). While we do not reject the first, we find support for the later and thereby extend the applicability of effectuation theory to the study of all entrepreneurs, novices and experts alike. As an extension, and granted the caveat that based on our sample we cannot draw strong conclusions about expertise as such, this study also contributes to research about what it is exactly that expert entrepreneurs become better at (Dew et al., 2009). Given that starting a new venture involves uncertainty, ESE may well be one of the most important qualities to be acquired through entrepreneurial experience. We thus contend that confidence in entrepreneurial ability, which at least for novices, is routinely portrayed as a cognitive error (Hayward et al., 2006), may also have a positive impact on decision-making, as long as confidence in prediction is low (e.g., high perceived state uncertainty). In sum, to the extent that effectual logic is an important alternative to traditional-predictive-thinking, entrepreneurs can mitigate the seemingly negative consequences of an “experience deficit” by acting *as-if* they possess the relevant abilities to establish their ventures.

Acknowledgments

We are grateful to Shabie Shafei and Martine Slütter for all their help and support during the data collection for this study. We thank Alexander McKelvie and participants of the BCERC 2014 as well as the 2014 SMS special conference in Copenhagen for their developmental comments on earlier versions of this paper. In addition, we gratefully acknowledge the highly valuable suggestions from editor Dimo Dimov on prior drafts. The study was supported by a grant from the Netherlands Organisation for Scientific Research (NWO, Grant Number: 017.007.108).

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