

Logics and Rationalisations Underpinning Entrepreneurial Decision Making

Vershinina, Natalia; Barrett, Rowena; McHardy, Peter

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Logics and rationalisations underpinning entrepreneurial decision-making

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Logics and rationalisations underpinning entrepreneurial decision-making

Abstract

Purpose: This article explores the logics that expert entrepreneurs use when faced with a critical incident threat.

Design/methodology/approach: Attempts have been made to define “entrepreneurial logic”. This article is influenced by Sarasvathy’s work on high-performance entrepreneurs, which finds that when faced with uncertainty entrepreneurs employ unconventional logic, and encompasses later research acknowledging social contexts where entrepreneurs operate. A typology of decision-making logics is developed, taking into account the situation of crisis. Seven expert entrepreneurs who faced crisis and, despite this, are still successfully operating businesses were interviewed. The article develops a critical incidents methodology.

Findings: Experienced entrepreneurs were found to tend towards causal logic when “the stakes were high” and the decision may affect the survival of their business. They also weigh up options before acting and tend to seek advice from trusted “others” within their network before or after they have made a decision. A mixture of causal and intuitive logic is evident in decisions dealing with internal business problems.

Research limitations/implications: The decisions that entrepreneurs make shape and define their business and their ability to recover from crisis. If researchers can develop an understanding of how entrepreneurs make decisions – what information they draw upon, what support systems they use and the logic of their decision-making and rationalisation – then this can be used to help structure support.

Originality/value: By exploring decision-making through critical incidents we offer an innovative way to understand context-rich, first-hand experiences and behaviours of entrepreneurs around a focal point.

Key Words: Entrepreneur, Decision-making, Rationalisation, Logic, Rationality, Effectuation, Intuition.

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3 *Paper type:* Research Paper.
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6 **1. Introduction**

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8 The 2008 Global Financial Crisis had negative implications for many large and small firms.
9 In large firms, decision-making is often diffused and shared while the decision-makers often
10 need to take account of a wide array of conflicting interests. Are the small firms' owners
11 dealing with similar situations? The aim of this paper is to explore entrepreneurial decision-
12 making in a time of crisis – at a critical incident. In order to do this, theories are examined
13 explaining entrepreneurial decision-making processes, and specifically those dealing with
14 rational versus intuitive approaches and the “logic” of entrepreneurial decisions. In particular
15 we focus on Sarasvathy's (2001a) distinction between causation and effectuation. Her
16 research shows that when faced with a myriad of uncertainties entrepreneurs tend to employ
17 an effectuation logic to the extent that it is possible to influence future events, such that there
18 is no need to predict them (Sarasvathy, 2007; Andersson, 2011). However, as Miller (2007)
19 acknowledges, this is done in a dynamic social context. Through interviews with seven
20 entrepreneurs operating in Leicester in the United Kingdom we develop a typology that
21 allows us to explore how these entrepreneurs make decisions, the logic they use, and the
22 support mechanisms they draw upon to reduce the risk of failure. In developing this typology
23 of logic that entrepreneurs use this study builds upon Sarasvathy's and Miller's works,
24 illustrating how the decision-making process emerges from the wider social context. The
25 main contribution this paper makes is the insight into how entrepreneurs make decisions
26 during critical events and what role their support network plays in solving problems. The next
27 section of the paper defines the various decision-making approaches and discusses the theory
28 underpinning this research.
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44 **2. Rationality and intuition in decision-making**

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46 The classical view of decision-making suggests that the decision-maker passes through a
47 series of stages before a decision is reached. These stages include defining the problem,
48 clarifying the objectives and alternatives, and then assessing the risks of different alternatives
49 (Hammond *et al.*, 1999). Essentially, this view explains decision-making as a rational
50 process, where the actions of the decision-maker are structured in relation to the end goal
51 (Mannheim, 1935). Underpinning this way of thinking is an assumption that individuals are
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3 in control of their world and by collecting relevant information they are able to predict the
4 outcomes of their decisions (Cunningham *et al.*, 2002).
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8 Unfortunately, this does not sit comfortably with reality and has led to an exploration of the
9 alternative of rationality – irrationality – in decision-making. Underpinning this concept is an
10 acknowledgement that many conscious and unconscious acts or thoughts are driven by
11 impulses, wishes and/or feelings – the so-called intuition, which (Mannheim, 1935) defines
12 as “substantial rationality or intuitive rationality”. These ideas have been taken up in the
13 entrepreneurship field and are most noticeable in the works of Sarasvathy (2001a), who refers
14 to this as “effectual” logic, or the entrepreneur’s “sixth sense,” which allows the entrepreneur
15 to react to changes in the environment. In recent years a number of studies have explored
16 how decisions are made by successful entrepreneurs or those operating in corporate settings
17 (Aldrich and Zimmer, 1986; McGrath *et al.*, 1992; Baron, 1999; Sarasvathy, 2001b;
18 Cunningham *et al.*, 2002; Joyce and Woods, 2003; Baron, 2007; Sarasvathy, 2007; Dyer *et*
19 *al.*, 2008). The underlying purpose of these studies was to identify the “entrepreneurial logic”
20 used to make decisions (Scott and Bruce, 1994; Nutt, 1999; Cunningham *et al.*, 2002;
21 Sarasvathy, 2007).
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32 Sarasvathy (2001a) argues that entrepreneurial action proceeds according to a logic of
33 causation or effectuation. Both logics treat the opportunity as created, but effectuation makes
34 goals endogenous and emergent rather than logically prior to creating an opportunity. This
35 distinction between causation and effectuation provides further insight into the courses of
36 action associated with opportunity creation or problem-solving. *Causal logic* involves
37 selecting appropriate means to achieve chosen ends, while following a causal logic requires
38 clarifying goals and an understanding of the relationship between means and ends. *Effectual*
39 *logic*, however, starts with available means that are the basis for choosing feasible ends.
40 Following effectual logic requires only general aspirations, and specific goals emerge in the
41 entrepreneurial process. An entrepreneur’s preferences and goals are formed in an ongoing
42 learning process, which is shaped by the effectuation processes. As such, understanding how
43 entrepreneurs learn to think entrepreneurially requires an exploration of “how deep
44 knowledge structures are changing ... and ... how entrepreneurial thinkers structure and learn
45 to structure their knowledge, tacit or otherwise ...” (Krueger, 2007).
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56 This represents a new way of thinking about entrepreneurial action. We can look to the
57 stream of risk and uncertainty research from Knight (1921) onwards that has characterised
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3 entrepreneurial rationality as investment decision-making when outcomes are probabilistic.
4 Recognising that this is a unique, historically-situated perspective raises a prospect that there
5 may be alternative ways of understanding entrepreneurship that call for other perspectives on
6 risk and rationality. Risk arises from the inability to predict future environmental states
7 (Miller, 2007). Under conditions of uncertainty, less reliable and verifiable information about
8 the underlying distribution of outcomes is available than under conditions of risk (Knight,
9 1921; Simon, 1973; deMattos *et al.*, 2012). Evidence suggests that many decision-makers are
10 systematically over-optimistic about their future prospects and that founders are especially
11 prone to over-optimism (Cooper *et al.*, 1988; Camerer and Lavallo, 1989; Alvarez and
12 Parker, 2009). Knight's discussion of uncertainty provides a striking anticipation of modern
13 treatment of market failure (LeRoy and Singell, 1987. p. 396).

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22 Miller (2007, p. 59) argues that Knight (1921) suggests the rational response to uncertainty is
23 seeking to reduce it to risk or, if that is not possible, to avoid investing altogether. As such,
24 initiating a venture in the face of uncertainty is to act upon "intuition", "whim" or "opinion",
25 rather than investing on the basis of expected profit. Rational decisions are possible only
26 under risk, which permits computation of expected values and determination of whether the
27 situation provides adequate compensation for the capital placed at risk. Hence, Knight's
28 theory of entrepreneurship depends on individuals having different abilities to convert
29 situations of uncertainty towards situations of risk, not just on having differences in risk
30 propensities (Kihlstrom and Laffont, 1979; Miller, 2007; Ndemo and Maina, 2007).

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39 Three recent papers contribute to this debate. Francioni *et al.* (2015, p. 2240) found that a
40 more risk-seeking attitude brings the decision-maker to follow a more rational approach to
41 the key strategic decisions. However, in cases where the decision-maker is not fearful of the
42 risks pertaining to relevant strategic decisions they face them with a high awareness and pay
43 attention to the choices they make. This result contrasts the idea that small entrepreneurs
44 instinctively follow their intuition (Musso and Francioni, 2014). Moreover, Maine *et al.*
45 (2015, p. 65) suggest that entrepreneurs may be able to enhance their resilience to external
46 shocks and their ability to exploit contingencies through flexibility, thus employing
47 effectuation-based decision-making; however, they seem to find that the entrepreneurs act
48 rationally by, for instance, avoiding major investment decisions. Nevertheless, Maine *et al.*
49 (2015, p. 67) note that in highly uncertain environments entrepreneurs become more causal in
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3 analysis and decision-making, and their firm's strategy becomes more rigid, less
4 experimental and less resilient.
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8 Nevertheless, Wu and Knott (2006) suggest that entrepreneurs are risk-averse regarding
9 demand uncertainty but over-confident regarding their own ability, resulting in apparent risk-
10 seeking behaviour. Dyer *et al.* (2008, p. 318) explain that entrepreneurs are prone to cognitive
11 biases, notably the over-confidence bias and representativeness bias (Parlich and Bagby,
12 1995; Busenitz and Barney 1997; Zhao, 2009; Dinur, 2011). These biases act by motivating
13 entrepreneurs to persist in pursuing new venture ideas, increasing the probability of venture
14 creation. The over-confidence bias arises when individuals rank their own positive qualities
15 or virtues as being higher than they really are. A quality which tends to be overestimated is
16 the ability to forecast the future, and this over-confidence leads individuals to underestimate
17 possible uncertainties in a decision environment (Tversky and Kahneman, 1974; Sarasvathy,
18 1999). Knight (1921, p. 220) expressed an appreciation for the distinction between
19 "ignorance" and "real indeterminateness", choosing the latter as his typology of probability
20 situations.
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30 This paper aims to answer the following research question: What logics do decision-makers
31 use when faced with a critical threat or a crisis? Solutions come from the basic cognitive
32 processes that allow the entrepreneur to operate on and use information in new ways (Baron,
33 2007, p. 169). From where do they get this information? Dyer *et al.* (2008) argue that
34 entrepreneurs may have superior access to information because they have larger and more
35 diverse social networks that provide a conduit for information. Renzulli *et al.* (2000) found
36 that entrepreneurs with networks that spanned multiple domains of social life saw
37 opportunities more frequently. Moreover, Baron (2007, p. 172) has claimed that
38 entrepreneurs' social skills (their ability to interact with others in an effective manner) and
39 their social networks (networks of personal relationships with others) help them to acquire
40 the resources they need to make decisions (Aldrich, 1999; Andressen, 2011). Such thinking is
41 consistent with that of social network theorists who have argued that the structure of one's
42 social relationships determines the quantity of information, the quality of information, and
43 how rapidly information can be acquired. In terms of entrepreneurial decision-making this is
44 important and critical to discovering entrepreneurial opportunities (Marsden, 1983; Aldrich
45 and Zimmer, 1986; Rodan and Galunic, 2004; Uzzi and Spiro, 2005). This resonates with
46 research, such as a comparative study of entrepreneurs and executives on opportunity search
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3 where Kaish and Gilad (1991) found that entrepreneurs spent significantly more time
4 searching for information through non-verbal scanning in their “off hours”. A related stream
5 of research on cognition points to entrepreneurs being superior at pattern recognition –
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7 noticing connections between trends, changes and events which appear, at first glance, to be
8 unrelated (Baron, 2006). Baron (2006, p. 171), building on prior psychological research (i.e.
9 Sternberg and Davidson, 1995), notes that pattern recognition involves “noticing meaningful
10 patterns in complex events or changes, includes: (1) recognizing links between trends,
11 changes and events that appear at first glance to be unconnected; and (2) noticing that these
12 connections [come] from an identifiable pattern”. Pattern recognition can therefore play an
13 important role in entrepreneurial alertness and suggests that some individuals may be more or
14 less “alert” to various opportunities because they possess cognitive frameworks that permit
15 them to notice emerging opportunities even when they are not actively searching for them.
16 Their frameworks serve as templates that assist such persons to recognise emergent patterns
17 and opportunities related to them.
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27 This type of thinking suggests that the logic to entrepreneurial decision-making depends on a
28 range of factors, in particular that individuals differ greatly in terms of the cognitive
29 frameworks they possess. These frameworks, while useful in helping them to “connect the
30 dots” between seemingly unrelated events or trends, are formed through interactions with
31 others in social networks and their subjective beliefs, values and attitudes that develop over
32 time and which may change over time on the basis of previous decisions and the acceptance
33 of new information. As Miller (2007) argues, entrepreneurial decision-making is also
34 influenced by the creative identity of the individual. Here creativity is understood as
35 proceeding on the basis of problem-solving heuristics, which draw upon prior knowledge
36 (e.g. through novel re-combinations) or as an expression of personal freedom (making
37 creativity different from either deterministic or random acts). As such, creativity draws upon
38 past learning but is not fully constrained by it. Identity also provides a critical logic, and
39 entrepreneurial events arise not only from looking forward (i.e. anticipating future prospects)
40 and looking backward (i.e. learning from experience) but also from looking inward (as an
41 implication of one’s sense of self) (Miller, 2007, p. 66).
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53 If we acknowledge that entrepreneurs operate within a dynamic social system that
54 incorporates them as individuals in relation to others who can influence and can be influenced
55 by decisions made within the business, then we can develop a typology of the logic of
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entrepreneurial decision-making and rationalisation of such decisions. This typology considers from where entrepreneurial decisions are derived – the source of the information used to make decisions – which in part depends on the nature of the decision to be made. While Sarasvathy’s work on high-performance entrepreneurs’ cognitive biases shows that, when faced with a myriad of uncertainties, entrepreneurs tend to employ unconventional logic to the extent that it is possible to influence future events such that there is no need to predict them (Sarasvathy, 2001a, 2007). As a result, they construct new frameworks to understand the environment (Weick, 1995). Miller’s (2007, p. 70) point is taken that this overplays the role of the individual and the argument that entrepreneurs need to be examined within their social context. Entrepreneurs utilise a network of support mechanisms in decision-making, which they draw upon to reduce the risk of failure. To this effect, it is suggested that not only do entrepreneurs tend to look backward, forward and inward when making decisions, but that they also look outward and engage with, and are influenced by, others in their decision-making. This is represented in the “networked” dimension of the typology developed here to go beyond the individualistic orientation of entrepreneurs in their decision-making. Looking inward and outward, as well as looking forward and backward, therefore serves as the basis of the typology of logic in entrepreneurial decision-making shown in Figure 1.

Insert Figure 1 about here

The next section of the paper uses the typology as the basis for examining the logic of entrepreneurial decision-making, and particularly decision-making at a time of crisis.

3. Research method

Semi-structured interviews were undertaken with seven expert entrepreneurs who were operating successful businesses in the manufacturing through to marketing sectors. A purposive sampling technique was employed as expert entrepreneurs who have experienced and overcome a crisis are rare. The Business Link in Leicester was approached and subsequently provided the contact details of 20 expert entrepreneurs who fitted the criteria of

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3 managing a crisis within their own business and acting as mentors to local enterprises dealing
4 with a crisis. Of these, seven agreed to participate in the study, corresponding to 35% of
5 available respondents. Adopting Glaser and Strauss (1967), theoretical saturation was
6 achieved with just seven case studies, as the last few cases gave very similar responses as to
7 how the expert entrepreneurs were dealing with specific critical events within their business.
8 Appendix 1 provides the demographics of the participants and their firms. The interviews
9 were conducted in the summer of 2008, just at the start of the Global Financial Crisis. The
10 purpose of the interview with the business founder/owner was to elicit information about
11 their business and the role they played within the business on a day-to-day basis, as well as
12 the basis for their business. Interviewees were questioned about how they thought they made
13 decisions and where they drew information from to help them make decisions, as well as how
14 as mentors they were advising other businesses to prepare for and deal with the consequences
15 of crises. Through this process of questioning the focus turned to a critical incident they
16 experienced in the life of their business and the businesses they were advising.
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27 The use of the critical incident technique (CIT) methodology helped to understand how
28 entrepreneurs make decisions at the time of crisis. Flanagan (1953, p. 335) argues that the
29 “critical incident technique is essentially a procedure for gathering certain important facts
30 concerning behaviour in defined situations”. To that effect the interviewee was asked to
31 describe the incident, why they saw it as being a critical incident and then the process by
32 which they resolved the problem at the heart of the incident. More recently, work has been
33 undertaken by Chell and Pittaway (1998), who build on McClelland (1987) in using a
34 technique termed the “Behavioural Event Interview” to identify behaviours associated with
35 business development and entrepreneurship. As Chell and Pittaway (1998, p. 24) illustrate,
36 “... studies in the tradition of Flanagan have assumed the tenets of the scientific method and
37 used the CIT as a quantitative method ...” Their study proposed six elements of the research
38 process relevant to CIT, which are adopted within this study:
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- 48 (i) gaining access
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- 51 (ii) focusing the theme and giving an account of oneself as researcher to the
- 52 respondent
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- 55 (iii) introducing the CIT method
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- (iv) controlling the interview, by probing the incidents and clarifying one's understanding
- (v) concluding the interview
- (vi) taking care of ethical issues.

The process that researchers need to follow when utilising CIT is very specific, and requires undertaking initial research on the subject to bind the investigation, identifying selection criteria for the sample and interviews schedules, and undertaking the actual interviews in an unstructured or semi-structured way. Moreover, Chell and Pittaway (1998) suggest that the interviewer needs to have a sound understanding of the theoretical issues involved, to understand the areas that need further probing and to be able to adapt the questioning to a particular interviewee. The use of CIT was particularly relevant within this study, as this method enables the study of a phenomenon that cannot be studied outside its natural setting.

The interviews were undertaken in a semi-structured fashion; however, the starting points were around the founder, their business experience and motivations to set up this business, and then moved on to identify the fundamental events that have changed the business direction or particular outcomes. The conversations unfolded in a variety of ways and led to evidence of intuitive and rational responses to specific problems the respondents have faced. To control the flow and the content of the interview Chell's (2014) recommendations were followed to actively engage in steering the expert entrepreneurs to discuss in greater depth the critical incidents that they identified. To prevent the interview from descending into unfocused accounts, generic probing questions were used following Chell (2014, p. 120): *What happened next? Why did it happen? How did it happen? With whom? What did the parties concerned feel? What were the consequences – immediate and long term? How did you cope? What tactics did you use? Why was it appropriate at the time? What did you learn from this incident? What would you have done differently? How does this affect going forward?* The use of CIT in understanding the way expert entrepreneurs make decisions and rationalisations of those decisions within this paper enabled the researchers to identify and analyse patterns of thinking that underpinned actions as a result of important events that participants discussed. This methodological approach provided what Leitch (2015, p. 194) identifies as "context-rich first hand perspectives on human activities and their significance".

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3 In conducting the interview analysis a constant comparative method, as described by
4 Browning *et al.* (1995, p. 121), was used to extract categories and themes from the interview
5 data. To aid the qualitative data analysis process the transcripts were entered into NVivo and
6 this software was used to help reveal patterns and themes associated with the entrepreneurial
7 decision-making process, as well as the sources of information and support they drew upon.
8 The transcripts were initially coded by one researcher to attribute the decision-making into
9 effectual or rational. Through cross-case comparison evidence of the overlap between
10 rational and effectual dimensions were also established in the data. This process of constant
11 comparison enabled the researchers to signpost the decision-making patterns and associate
12 the evidence with the entrepreneurial logics from the proposed typology, as this was carried
13 out by two researchers testing for inter-coder reliability. To illustrate the three positions on
14 the developed typology, three vignette cases are included, one each for Experiential,
15 Networked Anticipatory and Network Experiential. These have been chosen on the basis of
16 the fit with the typology and the level of expertise the respondents had, based on the age of
17 their founded firms, whether they have experienced a particular critical incident internally or
18 externally. and if that had an effect on their business and entrepreneurial developments.
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31 This study is subject to the general limitations of generalisability associated with field
32 research, which are well documented (Eisenhardt, 1989). However, the organisation and
33 structuring of the data around common themes enables the building of multiple case studies
34 where similarities and differences can be explored. Multiple respondents provide a stronger
35 base for theory-building (Yin, 1994) and the findings are generalisable to theory (Eisenhardt,
36 1989).
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42 **4. Key findings and case study illustrations**

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45 The decision-making process and the logic underpinning those decisions were explored by
46 controlling the interviews around a particular critical incident pertinent to the survival of the
47 entrepreneurial venture. Where entrepreneurs draw information from to help them make
48 decisions was also explored. Table 1 shows the examples of critical incidents identified by
49 entrepreneurs as those that challenged their thinking, and made them make decisions within
50 their organisation. It can be seen that some of the more critical problems were those that are
51 generically faced by any business, for example: *a fire in the factory*, which had an
52 unprecedented effect on the firm's ability to deliver on schedule; the *loss of key customers*,
53 which created a lack of financial resources within the business and put the business in a
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3 severe financial situation; and *problems with market entry* for a newly developed business, as
4 the industry it sought to enter had high barriers to entry that were not apparent based on the
5 research undertaken.
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12 Insert Table 1 about here
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17 Table 1 assigns specific types of entrepreneurial logic used to support each entrepreneur's
18 decision-making. The interviewees were asked about how they thought they made decisions
19 following the critical incident schema. A set of more detailed excerpts in Table 2 and Table 3
20 represents the summary of the thematic analysis. A number of key statements made by the
21 expert entrepreneurs were identified in relation to how they thought they dealt with a critical
22 incident, enabling the process of their decision-making as they dealt with the critical incident
23 to be mapped out in relation to key justifications, embedded in rational and intuitive
24 principles.
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34 Insert Table 2 about here
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46 The quotes in Tables 2 and 3 are illustrative of the effectual (intuitive) and more rational
47 approaches to solving problems in relation to critical incidents.
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51 Table 4 maps out further excerpts from respondents, indicating the overlap between rational
52 judgements and more intuitive effectual principals that formed the basis for their decision-
53 making. This second-level coding, using the constant comparative method, provided support
54 for classifying the critical incidents and the associated entrepreneurial logic utilised in
55 decision-making.
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12 It is clear that there is a degree of effectuation as well as causation in the logic underpinning
13 respondents' decision-making. However, it is also apparent that effectual and causal thinking
14 are not mutually exclusive, and both logics inform decision-making at different points in
15 time. Moreover, it was apparent from the interviews that decisions were not made by simply
16 looking *inwards*. In each of the cases the entrepreneur consulted another person either
17 associated with their business or family, for example "*I talk to my wife, she works and she*
18 *has HR issues as well, so we often swap of [sic] stories*" (CH, Vignette 2), or who had
19 particular expertise to help them make the "right" decision.
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27 Three vignettes have been selected to illustrate the decision-making around critical incidents
28 in more detail. These provide evidence underpinning the types of logic outlined in the
29 typology of entrepreneurial logic.
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33 *Vignette 1: BE's response to a fire in the factory – Experiential Logic*
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36 In the case of BE the critical incident was a fire that destroyed the entire factory and all its
37 output. This was devastating, and signalled a complete end to the business. However, BE
38 refused to accept the loss adjustor's decision on the insurance payout for the business. It was
39 through his own dogged determination, and after others in the business had given up, that he
40 sat down and combed through the insurance documents trying to find a solution. As he
41 explains:
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47 *... we had a massive fire which melted the whole production operation and we*
48 *thought the world had ended. It was terrible. I sat up thinking what's the way out of*
49 *this? ... Some chaps even left the company, I think they thought we couldn't recover*
50 *... we were offered by our insurance company damages to rebuild the equipment,*
51 *damages were about £150 000. But of course we lost trade in that period. So what I*
52 *did was search through our insurance policy and I found a small clause in it that*
53 *meant we could call in a loss adjuster and through the loss adjuster we got 3.2*
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3 *million. That was the difference. As a result we were offered by our insurance*
4 *company damages to rebuild the equipment, the building – all the damage ... I just*
5 *happened to spot the solution by searching and searching.*
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9 However, while BE drew upon his experience to find a solution, he then needed to have that
10 solution confirmed by his Board. As he explained:

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13 *I came to a conclusion, my conclusion as to what the answer was. I then asked my*
14 *Board before taking any actions. I said to the executive Board, “This is what I came*
15 *up with, what do you think? Throw rocks at this” ... We all then came to the same*
16 *conclusion to call in the loss adjuster. The board agreed. If you try to fly solo – it*
17 *doesn't work ...*
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23 *Vignette 2: CH's response to a key customer going bankrupt – Networked Experiential Logic*
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26 In the case of CH the critical incident was a financial damage caused by a key customer
27 going bankrupt. This was an unexpected event and it had severe consequences on the
28 business's cash flow. As CH explains:
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32 *... It took us by surprise. It was a company that grew like hell and we suspected it was*
33 *out of control, but while it was growing we didn't worry. We were making a lot of*
34 *money out of it, so when it went bust ... they had a debt of £50 000. As a result we had*
35 *[a] 25% drop in sales, so I went into red and so ... I was wondering whether this drop*
36 *in sales would leave us so low in terms of margin, that we would not be profitable. So*
37 *it was a turmoil! I had to act fairly decisively ... it was probably intuition ... I knew I*
38 *had to lay off people in the warehouse ...*
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45 Although CH came up with a solution alone and the time was pressing for it to be
46 implemented, he consulted his directors, who were not keen on engaging with this type of
47 decision. As CH explains:
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51 *What I did is bounce some of my ideas off the management team to see whether I had*
52 *forgotten something or if there was something I still had to do. I gave them an*
53 *opportunity to contribute to the decision and perhaps fine tune it ... Did they really*
54 *contribute? I think they were shell shocked and did not really want to partake in the*
55 *exercise ... But I had to let them know what we were doing. And, once again, I was*
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3 *just checking with them. I needed to know if I was wrong or forgetting something,*
4 *these were the steps I took.*
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7 CH also talked about the wider impact and the consequences of these types of decisions and
8 the rationale for choosing the person to be fired:
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11 *But we operate in a small town, so it is not just the business you think about, it will*
12 *have a big impact on the person also ... so there are consequences. In a small town*
13 *you need to be careful about laying people off. And the person I had to lose ... I did*
14 *talk to the other managers in the end, and eventually we made it together. We isolated*
15 *the person who was not very flexible; we were moving to using IT with our clients and*
16 *this person was struggling to cope with all that. Bloody good at the rest of the job,*
17 *fantastic organiser, but eventually I had to let them go. That person eventually ended*
18 *up working for one of our clients ...*
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26 *Vignette 3: LA's considerations about re-branding of the business – Networked Anticipatory*
27 *Logic*
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31 In the case of LA the critical incident was to do with a decision to re-brand the business and
32 ensure that it more eloquently represented the business they were in. As LA explains:
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35 *... the most critical issue was re-branding. This caused a number of conflicts and*
36 *made us have discussions every day about which logo we should use and did it really*
37 *depict the brand we wanted it to, and so on. The logo was crucial for many reasons*
38 *with the company being split between printing and designing, and we were trying to*
39 *incorporate the design into becoming more important as that was where the value-*
40 *added was going to. That logo needed to be an example of what the design studio was*
41 *capable of, but also, I think, in terms of colour it needed to evoke trust and give a*
42 *sense of creativity and convey the innovative nature of the company as well ...*
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50 It was not a decision that was made by LA alone. The initial decision was conceived between
51 the partners and the consultant; however, in order to ensure there were positive consequences
52 to their decision a number of other parties were consulted. LA explains:
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56 *The initial decision as to whether to re-brand was really between me, Steve and our*
57 *consultant. And to some extent Marcus who was the production manager. But when*
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3 *the decision has been made to re-brand, then the choice of logos and the rest of the*
4 *marketing material, but particularly the logo, we had to get the other staff involved,*
5 *on the shop floor, we wanted them to give us their opinion, because we needed to*
6 *bring them along with the re-branding and make them feel part of it, and it[']s] always*
7 *good to get other people's perceptions. It took a long time to get there, but we got*
8 *there in the end ...*

14 She went on to explain in more detail the reasons for seeking information from within her
15 network to help them resolve the problem:

18 *... ultimately we talked to the people who were going to be buying from us, but also*
19 *because when you are looking at changing the market you need to know what your*
20 *current customers are thinking because you need to take them along to support you in*
21 *the first stages. But it wasn't just people, we also looked at our competitors, because*
22 *we were looking to distinguish ourselves. Doing this also helped me to be confident*
23 *that I was making the right decision ... I suppose there were alternatives: we could*
24 *have done nothing, left things as they were. But the long-term strategy and I think*
25 *with the way the market was moving meant this really wasn't an option. In the end we*
26 *knew it was the right thing to do, I knew it instinctively, really ...*

35 These three cases depict three of the four types of entrepreneurial decision-making logic.
36 However, they also show that decision-making is not a solitary activity for entrepreneurs, and
37 while intuition forms an important part in the formulation of their initial solution, rational
38 logic becomes imperative when the stakes are high. Looking *outwards* and *seeking*
39 *information from others* help to minimise risk and enable the experiences of others to be used
40 fruitfully in solving problems. In effect, these show that effectual thinking is moderated by
41 rational logic.

47 **5. Discussion**

50 The purpose of the study was to examine the emerging approaches entrepreneurs take to
51 decision-making in the context of a critical incident. To achieve this, research on decision-
52 making was examined, particularly that of Sarasvathy (2001a), where she distinguishes
53 between causation and effectuation and argues that effectual logic defines entrepreneurial
54 decision-making. In other words, she argues that amongst expert entrepreneurs it is an
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3 intuitive logic that predominates in decision-making. However, recently there have been
4 criticisms of this approach by Arend *et al.* (2015) and Miller (2007), in particular arguing that
5 entrepreneurs cannot be isolated when exploring decision-making, as the social context in
6 which they operate must be taken into account. A typology is developed here, categorising
7 the logic of entrepreneurial decision-making based on effectual or causal logic as well as
8 from where entrepreneurs draw information – internally or externally. The types are:
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14 1. Anticipatory Logic, where the entrepreneur anticipates future prospects based on what
15 they know; in other words they think causally and look inwards.
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17 2. Experiential Logic, where the entrepreneur looks inwards and draws the solutions to
18 their problem from their own experience and is therefore thinking effectually.
- 19
20 3. Networked Anticipatory Logic, where the entrepreneur anticipates the future and
21 checks with those from within their wider social network and thus draws knowledge
22 by looking outward.
- 23
24 4. Networked Experiential Logic, where the entrepreneur draws on their own experience
25 as well as that within their wider social network to find a solution to their problem.
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30 This typology allows the different approaches to decision-making used by entrepreneurs
31 when they respond to a critical incident to be evaluated. It suggests that when entrepreneurs
32 make a decision by themselves, whether relying on rational reasoning or intuition, this
33 decision is likely to be less informed than if they consult others more widely from their social
34 network. There is greater risk involved in not consulting others – not that others are able to
35 provide a definite solution. It may mean that others operate in more of a social comfort role in
36 this critical decision-making process. This does not change the level of uncertainty that
37 Knight (1921) identified, but instead helps the entrepreneurs to manage uncertainty down to
38 risk.
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46 The interviews with seven expert entrepreneurs who operated a range of businesses differing
47 in size and age revealed that many of them think that their decision-making is based on
48 intuition or effectual logic. It became apparent from the interviews that intuition played a key
49 role in the decision-making process, and came from either an innate ability and a more
50 subconscious reaction to a crisis situation, or general experience that had been accumulated in
51 response to problems solved by these entrepreneurs in the past. Past decisions act as learning
52 experiences and inform contemporary decisions and, as such, a heuristic is developed and
53 used. Intuition provides the initial stimulus for a decision, and all seven interviewees
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3 mentioned intuition as a part of their decision-making process. However, what transpired was
4 that a decision-maker who was aware of intuitive influences at the decision formulation stage
5 was likely to moderate their instinct with a consideration of rational information and
6 alternative solutions. Indeed, when exploring decision-making in response to a critical
7 incident no examples were found of the problem being dealt with using intuition or
8 effectuation alone.
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14 The results indicate that the logic underpinning entrepreneurial decision-making depends on
15 the nature and seriousness of the problem, and the entrepreneur's experience and their
16 consideration of the future consequences, which result from either looking *inward* or looking
17 *outward*. Similar to the findings of Francioni *et al.* (2015), it was found here that
18 entrepreneurs tended towards causal logic when "the stakes were high" and the decision
19 could have an effect on their firm's survival. However, the contribution of this research to the
20 debate is that in such situations they all sought advice from trusted "others" within their
21 social network, and either weighed up alternatives before acting or sought consent for their
22 decision. Moreover, another unusual response observed within the sample was the decision to
23 rationalise the decision that was already made with the trusted network, as if to "rubber-
24 stamp" it. This may represent a political dimension that Maine *et al.* (2015) explored but
25 found little support for within their study. A mixture of causal and effectual logic was
26 therefore evident in many decisions when entrepreneurs were looking outward to their
27 network. These results echo some of the findings from Francioni *et al.* (2015), who identified
28 that decision-makers tend to follow a more rational logic depending on their education level,
29 risk attitude, and the firm's past performance.
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42 Hence, the main contribution this research makes is that logics that underpin decision-making
43 of entrepreneurs have not previously been explored in the context of responding to a threat or
44 critical incident. Schumpeter stated, in Neubauer and Lank (1998, p.176), that "the success of
45 everything depends on intuition, the capacities of seeing things in a way which afterwards
46 proves to be true, even though it cannot be established at the moment ...". However, it is a
47 high-risk strategy to rely entirely on intuition. For appropriate instinctive decisions and
48 actions to crisis situations, and to situations that require an instant response, extensive
49 practice is required to indicate that the entrepreneur is ready to take the plunge, whereas for
50 decisions where there is more time available there should be procedures in place which will
51 allow for the "right" decision to emerge. It is problematic to suggest there is a mutually
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3 exclusive choice between causal and effectual logic when it comes to decision-making.

4 Entrepreneurs need to be able to analyse a problem systematically (using causal logic) and to
5 respond to situations rapidly (driven by effectuation). Successful entrepreneurs do not choose
6 between logics; instead, they use these as part of an arsenal of skills and apply each when it is
7 appropriate.
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11 **6. Conclusion**

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15 The decisions entrepreneurs make can shape and define their business, as well as their own
16 destiny. An understanding of how entrepreneurs make decisions – what information they
17 draw upon, what support systems they use and the logic of their decision-making and
18 rationalisation – can help to structure the support they need. The research carried out by the
19 major authors in the field informed by Sarasvathy (2001a,b), and lately by Maine *et al.*
20 (2015) and Francioni *et al.* (2015), tends to rely on the individualistic approaches to decision-
21 making, and examines the expert entrepreneurs as if they are isolated, rather than embedded
22 within the social context. Might this be due to the more individualistic behaviour amongst the
23 respondents within their studies? Such biases could be explored in future research.
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31 The present findings, somewhat contrary to recent work on entrepreneurial decision-making,
32 suggest that when it comes to an important decision that can have major consequences,
33 entrepreneurs rely on their intuition to generate a solution to the problem and then tend to
34 consult their wider network; by doing so they share the responsibility for decisions, seek
35 confirmation for their ideas or utilise these connections as social comfort. In support terms
36 this may mean facilitating access to other experts. Knight (1921) has contributed to a
37 thorough analysis of motivations and characteristics needed to become a successful
38 entrepreneur: “a successful uncertainty bearer and judgemental decision maker” (Van Praag,
39 1999, p. 322). The typology presented here attempts to capture this, seeking to explain the
40 types of logic used by entrepreneurs when making decisions.
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49 While the typology needs to be tested using a larger sample we did not find entrepreneurs
50 who used effectual logic alone. We have clear evidence of the decision-making and
51 rationalisation logic embedded within the social context of trusted or expert networks that
52 seems to be more useful in times of a critical event. This raises a question about the role of
53 effectuation and how it is used in the entrepreneur’s arsenal of skills. Decisions have
54 consequences beyond the individual alone, which experienced entrepreneurs are aware of. By
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3 looking outwards, entrepreneurs may be able to minimise risks as well as to overcome the
4 biases they hold and bring to decisions. This research points to an increasingly important
5 integration of social context when decisions are critical to survival. Moreover, critical
6 incidents might be significantly important for the life of the business, and how entrepreneurs
7 are learning from them and interacting with their networks can help society to make
8 sustainable decisions that can be successful in the long run.
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13 14 **References**

- 15
16 Aldrich, H. (1999), *Organizations Evolving*, Sage, London.
17
18 Aldrich, H. E. and Zimmer, C. (1986), "Entrepreneurship through social networks" in Sexton,
19 D. L. and Smilor, R.W. (Eds), *The Art and Science of Entrepreneurship*, Ballinger,
20 Cambridge, MA, pp. 3-23.
21
22 Alvarez, S. A. and Parker, S. C. (2009), "Emerging firms and the allocation of control rights:
23 a Bayesian approach", *Academy of Management Review*, Vol. 34 No. 2, pp. 209-227.
24
25 Andersson, S. (2011), "International entrepreneurship, born globals and the theory of
26 effectuation", *Journal of Small Business and Enterprise Development*, Vol. 18 No. 3,
27 pp. 627-643.
28
29 Arend, R. J., Sarooghi, H. and Burkemper, A. (2015), "Effectuation as ineffectual? Applying
30 the 3E theory-assessment framework to a proposed new theory of
31 entrepreneurship", *Academy of Management Review*, Vol. 40 No. 4, pp. 630-651.
32
33 Baron, R. A. (1999), "Counterfactual thinking and venture formation: the potential effects of
34 thinking about 'what might have been'", *Journal of Business Venturing*, Vol. 15, pp.
35 79-91.
36
37 Baron, R. A. (2006), "Opportunity recognition: how entrepreneurs 'connect the dots' to
38 recognise new business opportunities", *Academy of Management Perspectives*, Vol. 20,
39 pp. 104-119.
40
41 Baron, R. A. (2007), "Behavioural and cognitive factors in entrepreneurship: entrepreneurs as
42 the active element in new venture creation", *Strategic Entrepreneurship Journal*, Vol.
43 1, pp.167-182.
44
45 Browning, L. D., Beyer, J. M. and Shelter, J.C. (1995), "Building cooperation in competitive
46 industry: sematech and semiconductor industry", *Academy of Management Journal*,
47 Vol. 38 No. 1, pp. 113-151.
48
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54
55
56
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59
60

- 1
2
3 Busenitz, L. W. and Barney, J.B. (1997), "Differences between entrepreneurs and managers
4 in large organizations: biases and heuristics in strategic decision-making", *Journal of*
5 *Business Venturing*, Vol. 12, pp. 9-30.
- 6
7
8 Camerer, C. and Lavallo, D. (1989), "Overconfidence and excess entry: an experimental
9 approach", *American Economic Review*, Vol. 89, pp. 306-318.
- 10
11 Chell, E. (2014), "The critical incident technique: philosophical underpinnings, method and
12 application to a case of small business failure", in Chell, E. and Karata-Özkan, M
13 (eds), *Handbook of Research on Small Business and Entrepreneurship*, Edward Elgar,
14 Cheltenham.
- 15
16
17
18 Chell, E. & Pittaway, L. (1998), "A study of entrepreneurship in the restaurant and cafe
19 industry: exploratory work using the critical incident technique as a methodology:
20 grounded theory procedures and techniques", *International Journal of Hospitality*
21 *Management*, Vol. 17 No.1, pp. 23-32.
- 22
23
24
25 Cooper, A. C., Woo, C.Y. and Dunkelberg, W.C. (1988), "Entrepreneurs' perceived chances
26 for success", *Journal of Business Venturing*, Vol. 3 No. 6, pp. 97-108.
- 27
28
29
30 Cunningham, B. J., Gerrard, P., Schoch, H. and Hong, C. L. (2002), "An entrepreneurial logic
31 for the new economy", *Management Decision*, Vol. 40 No. 8, pp. 734-74.
- 32
33
34
35 deMattos, P., Miller, D. and Park, E. (2012), "Decision making in trauma centres from the
36 standpoint of complex adaptive systems", *Management Decision*, Vol. 50 No. 9, pp.
37 1549-1569.
- 38
39
40
41 Dinur, A.R. (2011), "Common and un-common sense in managerial decision making under
42 task uncertainty", *Management Decision*, Vol. 49 No. 5, pp. 694-709.
- 43
44
45
46 Dyer, J. H., Gregersen, H. B. and Christensen, C. (2008), "Entrepreneurs' behaviours,
47 opportunity recognition, and the origins of innovative ventures", *Strategic*
48 *Entrepreneurship Journal*, Vol. 2, pp. 317-338.
- 49
50
51
52 Eisenhardt, K. (1989), "Building theories from case research", *Academy of Management*
53 *Review*, Vol. 14, pp. 532-550.
- 54
55
56
57 Flanagan, J. C. (1953), "The critical incident technique", *Psychological Bulletin*, Vol. 5 No.
58 4, pp. 327-358.
- 59
60
61
62 Francioni, B., Musso, F. and Cioppi, M. (2015), "Decision-maker characteristics and
63 international decisions for SMEs", *Management Decision*, Vol. 53 No. 10, pp. 2226-
64 2249.
- 65
66
67
68 Glaser, B. and Strauss, A. (1967), *The Discovery of Grounded Theory: Strategies of*
69 *Qualitative Research*, Wiedenfeld and Nicholson, London.

- 1
2
3 Hammond, J. S., Keeny, R. L. and Raifa, H. (1999), *Smart Choices: A Practical Guide to*
4 *Making Better Decisions*, Harvard Business School Press, Boston, MA.
5
6 Joyce, P. and Woods, A. (2003), "Managing for growth: decision making, planning, and
7 making changes", *Journal of Small Business and Enterprise Development*, Vol. 10 No.
8 2, pp. 144-151.
9
10
11 Kaish, S. and Gilad, B. (1991), "Characteristics of opportunities search of entrepreneurs
12 versus executives", *Journal of Business Venturing*, Vol. 6 No. 1, pp. 45-61.
13
14 Kihlstrom, R. E. and Laffont, J. J. (1979), "A general equilibrium entrepreneurial theory of
15 firm formation based on risk aversion", *Journal of Political Economy*, Vol. 87 No. 4,
16 pp. 719-748.
17
18
19 Knight, F. H. (1921), *Risk, Uncertainty and Profit*, Boston, MA: Hart, Schaffner & Marx;
20 Houghton Mifflin Co.
21
22
23 Krueger, N. F. (2007), "What lies beneath?: The experiential essence of entrepreneurial
24 thinking", *Entrepreneurship Theory and Practice*, Vol. 31 No. 1, pp. 123-138.
25
26 Leitch, C. M. (2015), "The critical incident technique: an overview", in Neergaard, H. and
27 Leitch, C.M. (Eds), *Handbook of Qualitative Research Techniques and Analysis in*
28 *Entrepreneurship*, Edward Elgar Publishing Ltd., Cheltenham, p. 191.
29
30
31 LeRoy, S. F. and Singell Jr., L.D. (1987), "Knights on risk and uncertainty", *Journal of*
32 *Political Economy*, Vol. 95 No. 2, pp. 394-406.
33
34
35 Maine, E., Soh, P. H. and Dos Santos, N. (2015), "The role of entrepreneurial decision-
36 making in opportunity creation and recognition", *Technovation*, Vol. 39, pp. 53-72.
37
38 Mannheim, K. (1935), *Man and Society in the Age of Reconstruction*, Harcourt Brace and
39 World Inc., New York.
40
41 Marsden, P. V. (1983), "Restricted access in networks and models of power", *American*
42 *Journal of Sociology*, Vol. 88 No. 4, pp. 686-717.
43
44 McGrath, R. G., MacMillan, I. C. and Scheinberg, S. (1992), "Elitists, risk-takers, and rugged
45 individualists?: an exploratory analysis of cultural differences between entrepreneurs
46 and non-entrepreneurs", *Journal of Business Venturing*, Vol. 7, pp. 115-135.
47
48 McClelland, D. C. (1987), "Characteristics of successful entrepreneurs", *The Journal of*
49 *Creative Behavior*, Vol. 21 No. 3, pp. 219-233.
50
51
52 Miller, K. D. (2007), "Risk and rationality in entrepreneurial processes", *Strategic*
53 *Entrepreneurship Journal*, Vol. 1, pp. 57-74.
54
55
56
57
58
59
60

- 1
2
3 Musso, F. and Francioni, B. (2014), "International strategy for SMEs: criteria for foreign
4 markets and entry modes selection", *Journal of Small Business and Enterprise*
5 *Development*, Vol. 21 No. 2, pp. 301-312.
6
7
8 Ndemo, B. and Maina, F. W. (2007), "Women entrepreneurs and strategic decision making",
9 *Management Decision*, Vol. 45 No. 1, pp. 118-130.
10
11 Neubauer, F. and Lank, A. (1998), *The Family Business: Its Governance for Sustainability*,
12 McMillan Press, London.
13
14 Nutt, P. (1999), "Surprising but true: half the decisions in organizations fail", *Academy of*
15 *Management Executive*, Vol. 13, pp. 75-90.
16
17
18 Parlich, L. and Bagby, D. (1995), "Using cognitive theory to explain entrepreneurial risk-
19 taking: challenging conventional wisdom", *Journal of Business Venturing*, Vol. 10 No.
20 6, pp. 425-438.
21
22
23 Renzulli, L., Aldrich, H. and Moody, J. (2000), "Family matters: gender, networks, and
24 entrepreneurial outcomes", *Social Forces*, Vol. 79, pp. 523-546.
25
26
27 Rodan, S. and Galunic, C. (2004), "More than network structure: how knowledge
28 heterogeneity influences managerial performance and innovativeness", *Strategic*
29 *Management Journal*, Vol. 25 No. 6, pp. 541-562.
30
31
32 Sarasvathy, S. D. (1999), "Seminar on research perspectives in entrepreneurship (1997)",
33 *Journal of Business Venturing*, Vol. 15, pp. 1-57.
34
35
36 Sarasvathy, S. D. (2001), "Causation and effectuation: toward a theoretical shift from
37 economic inevitability to entrepreneurial contingency", *The Academy of Management*
38 *Review*, Vol. 26 No. 2, pp. 243-263.
39
40
41 Sarasvathy, S. D. (2001), "Effectual reasoning in entrepreneurial decision making: existence
42 and bounds", *Academy of Management Proceedings*, Vol. 2001, No. 1, pp. D1-D6,
43 Academy of Management Conference.
44
45
46 Sarasvathy, S. D. (2007), *Effectuation: Elements of Entrepreneurial Expertise*, Edward Elgar,
47 Cheltnam.
48
49
50 Scott, S. G. and Bruce, R. A. (1994), "Determinants of innovative behavior: a path model of
51 individual innovation in the workplace", *Academy of Management Journal*, Vol. 37, pp.
52 580-607.
53
54
55 Simon, H. A. (1973), "The structure of ill structured problems", *Artificial Intelligence*, Vol. 4,
56 pp.181-201.
57
58
59 Sternberg, R. J. and Davidson, J. E. (1995), *Nature of Insight*, MIT Press, Cambridge, MA.
60

1
2
3 Tversky, A. and Kahneman, D. (1974), "Judgment under uncertainty: heuristics and biases",
4 *Science*, Vol. 185, pp. 1124-1131.

6 Uzzi, B. and Spiro, J. (2005), "Collaboration and creativity: the small world problem",
7 *American Journal of Sociology*, Vol. 111 No. 2, pp. 447-504.

9 Van Praag, M. C. (1999), "Some classic views on entrepreneurship", *De Economist*, Vol. 147
10 No. 3, pp. 311-335.

12 Weick, K. (1995), *Sensemaking in Organizations*, Sage Publications, Thousand Oaks, CA.

14 Wu, B. and Knott, A. M. (2006), "Entrepreneurial risk and market entry", *Management*
15 *Science*, Vol. 52, pp. 1315-1330.

17 Yin, R. K. (1994), *Case Study Research: Design and Methods*, Sage, Newbury Park, CA.

18 Zhao, S. (2009), "The nature and value of common sense in decision making", *Management*
19 *Decision*, Vol. 47 No. 3, pp. 441-453.

Table 1: Examples of critical incidents discussed

	BE	SB	MR	AA	CH	LA	LP
Critical incident	Fire in the factory	Firing a friend	Firing an employee	Working with a partner	Loss of key customer	Lack of brand recognition	Market entry problem
Type of problem	Loss of the building and contents	Loss of trust	Inability of an employee to do the job	Lack of input from partner	Negative financial situation	Ineffective marketing	High barriers to market entry
Type of solution	Careful examination of insurance documents	Putting aside personal relationship	Recourse to legal counsel	Buy out partner's share	Cut costs by reducing staffing numbers	Engaging in marketing and re-branding	Searching for market openings through a different network
Who was consulted	Board of directors	Wife	Legal helpline	Family	Accountant, directors within the business	Consultants	Business mentors, friends, family
What did they contribute?	Supported the decision	Intuitive understanding of personalities	Legal advice	General support	General support and factual data	Advice on how to market their services and to whom, and logo design	Contacts
Was the decision rational or intuitive?	Rational	Intuitive	Mixture of both	Mixture of both	Mixture of both	Rational	Rational
Typology of Entrepreneurial Logic	Experiential Logic	Networked Anticipatory Logic	Networked Experiential Logic	Networked Anticipatory Logic	Networked Experiential Logic	Networked Experiential Logic	Networked Anticipatory Logic

Table 2: *Effectual (intuitive) logic – first-level coding illustrations*

<i>Supporting evidence (data analysis)</i>	<i>Effectuation principles</i>
BE: “it is like having a set of cards in front of you and you play it accordingly”	Affordable Loss
SB: “often I would take decisions which are uninformed decisions based around my gut feel”	
SB: “I make decisions based on experience. I probably sort of try to leap forward and anticipate what would happen if – and maybe that is one of the driving forces in terms of the more experience you got the more easy it is to anticipate ...”	
BE: “most entrepreneurs don't think in straight lines”	Acceptable Risk
CH: “sometimes I work on impulse. I [’ve] got really strong values and that’s how I remember business. And if values get affected then I tend to act very quickly, instinctively”	Heuristic
BE: “if my antenna says don't do something, I stop”	Logic of Control
BE: “I prefer strongly not to go with the expected beliefs. I like to go against the herd”	
AA: “I think that all entrepreneurs trust their instinct. They make a decision and you convince yourself and you convince every single person that it is the right decision and it is the only decision ...”	
BE: “most times I've been right; sometimes I have been quite wrong”	Evaluation
BE: “it is a sense of understanding the temperature of the business”	
MR: “it felt more right than the other options available along the spectrum”	
MR: “I use intuition in my decision-making... I think I do get a feel, a sense of what is right”	

Table 3: Causal (rational) logic – first-level coding illustrations

<i>Supporting evidence (data analysis)</i>	<i>Rational principles</i>
AA: “you’ve got to look at cost implications; you’ve got to look at if it is possible”	Cost
BE: “but there is a balancing point in these kinds of decisions, which are right for the business in that they are most likely to achieve the outcome – and that outcome is [a] stronger organisation, more income, more robust, better able to withstand the competition, steeper in its cover in the event of any failures and more likely to deliver the necessary outcome” BE: “I’m balancing the value that the different decisions on the spectrum will deliver”	Balancing Act
MR: “I will always measure the situation. I won’t go on gut feel alone because I would feel personally uncomfortable with that”	Measuring the Situation
MR: “I had had some input internally which I was happy to take at face value but actually I wanted to verify it for myself. But I didn’t want to go back to the people who give me the advice internally and say ‘I’m not sure I believe this’, I wanted to do it for myself. So I did that bit separately and privately as it were in a sense of not involving them in my verification of the facts of the matter”	Verification Process
MR: “it is very rare that I come up with a decision because the moment happens to suggest it” LA: “if time is short, then I would make a judgement and go with it”	Expert Judgement

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Table 4: Evidence of overlap of Causal and Effectual logics

	<i>Affordable Loss</i>	<i>Acceptable Risk Heuristic</i>	<i>Logic of Control</i>	<i>Evaluation</i>
<i>Cost</i>	MR: "I try to find numerical justification for a lot of the decisions that we would make"	AA: "numbers don't lie, I mean, numbers are key in a lot of things, but at the same time I use intuition just as much as anything else"		
<i>Balancing Act</i>	MR: "I look for patterns in the business; I'll try to understand whether the history of business or any other business informs the decision"		MR: "I will always get a sense of what is right or wrong. But depending on the situation I will use that intuition to inform the decision to a greater or lesser degree"	
<i>Measuring the Situation</i>	SB: "there are many occasions when I should have had more information but I didn't have the brains to realise it"	CH: "I say this may or may not be the right way and you may or may not agree with this, but this is what we are going to do and I take responsibility for the outcome"		LA: "I suppose a lot of what I do is down to experience and gut feel"
<i>Verification Process</i>	BE: "I think we all try to be rational – I think we are rational – but if I think the data is wrong or there is something wrong somewhere then I become intuitive and don't act accordingly"	MR: "I talk to the board of the directors and the shareholders, then I talk to my wife because she has a view of our future, therefore the impact on the business and the risks and benefits of making decisions at that level"	MR: "if there is lots of disagreement, everybody's got a different view but I know that I'm right or think that I know that I'm right, then sometimes I just have to exercise my own authority"	CH: "for the big decisions I will take the data I have got but – you know other people carry on getting more and more data but once I got enough data I wait for the – I suppose what I'm doing is I brew it over in my mind until I get a eureka moment"
<i>Expert Judgement</i>		LA: "I need to know that it is a right thing. And whether it is initially a gut feel and I know it is right or whether I am not sure and I have then to do a bit of research and then gut feel for it"	CH: "I would always support my instinct with some sort of data, some rationale"	LA: "you have to pick out what is important and what is not when you are given a lot of information in whatever form; you have got to pick out the key"

Appendix 1: Participants

Code	Gender	Birthplace	Age	Business	Ownership	Established	Employees
BE	M	UK	55-64	Freezing equipment	Founder-owner	1980	120
SB	M	UK	45-54	Lawn-mowing sales	Founder-owner	1992	20
MR	M	UK	45-54	Cheque printing	Partner	1997	100
AA	M	UK	25-34	Hotel and restaurant	Founder-owner	2003	10
CH	M	UK	55-64	Direct marketing services	Founder-owner	1996	60
LA	F	UK	25-34	Printing services	Partner	2001	5
LP	M	UK	25-34	Vending machines	Founder-owner	2006	2

Figure 1: Typology of logic in entrepreneurial decision-making

	Looking forward	Looking backward
	Anticipating future prospects	Learning from experience
Looking inward An implication of one's sense of self	Anticipatory Logic <i>Causal</i>	Experiential Logic <i>Effectual</i>
Looking outward An implication of one's outside network of trusted people	Networked Anticipatory Logic <i>Networked Causal</i>	Networked Experiential Logic <i>Networked Effectual</i>

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