Logics and Rationalisations Underpinning Entrepreneurial Decision Making

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DOI:
10.1108/JSBED-06-2016-0092

Document Version
Peer reviewed version

Citation for published version (Harvard):
Vershinina, N, Barrett, R & McHardy, P 2017, 'Logics and Rationalisations Underpinning Entrepreneurial Decision Making', *Journal of Small Business and Enterprise Development*, vol. 24, no. 1.
https://doi.org/10.1108/JSBED-06-2016-0092

Emerald Journal of Small Business and Enterprise Development

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Journal:	*Journal of Small Business and Enterprise Development*
Manuscript ID	JSBED-06-2016-0092.R2
Manuscript Type:	Research Paper
Keywords:	Entrepreneur, Intuition, Rationality, Logic, Effectuation, Rationalisation, Decision-making

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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.

Paper type: Research Paper.

1. Introduction

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

2. Rationality and intuition in decision-making

The classical view of decision-making suggests that the decision-maker passes through a series of stages before a decision is reached. These stages include defining the problem, clarifying the objectives and alternatives, and then assessing the risks of different alternatives (Hammond *et al.*, 1999). Essentially, this view explains decision-making as a rational process, where the actions of the decision-maker are structured in relation to the end goal (Mannheim, 1935). Underpinning this way of thinking is an assumption that individuals are

in control of their world and by collecting relevant information they are able to predict the outcomes of their decisions (Cunningham *et al*., 2002).

Unfortunately, this does not sit comfortably with reality and has led to an exploration of the alternative of rationality – irrationality – in decision-making. Underpinning this concept is an acknowledgement that many conscious and unconscious acts or thoughts are driven by impulses, wishes and/or feelings – the so-called intuition, which (Mannheim, 1935) defines as "substantial rationality or intuitive rationality". These ideas have been taken up in the entrepreneurship field and are most noticeable in the works of Sarasvathy (2001a), who refers to this as "effectual" logic, or the entrepreneur's "sixth sense," which allows the entrepreneur to react to changes in the environment. In recent years a number of studies have explored how decisions are made by successful entrepreneurs or those operating in corporate settings (Aldrich and Zimmer, 1986; McGrath *et al.*, 1992; Baron, 1999; Sarasvathy, 2001b; Cunningham *et al.,* 2002; Joyce and Woods, 2003; Baron, 2007; Sarasvathy, 2007; Dyer *et al.*, 2008). The underlying purpose of these studies was to identify the "entrepreneurial logic" used to make decisions (Scott and Bruce, 1994; Nutt, 1999; Cunningham *et al.*, 2002; Sarasvathy, 2007).

Sarasvathy (2001a) argues that entrepreneurial action proceeds according to a logic of causation or effectuation. Both logics treat the opportunity as created, but effectuation makes goals endogenous and emergent rather than logically prior to creating an opportunity. This distinction between causation and effectuation provides further insight into the courses of action associated with opportunity creation or problem-solving. *Causal logic* involves selecting appropriate means to achieve chosen ends, while following a causal logic requires clarifying goals and an understanding of the relationship between means and ends. *Effectual logic,* however, starts with available means that are the basis for choosing feasible ends. Following effectual logic requires only general aspirations, and specific goals emerge in the entrepreneurial process. An entrepreneur's preferences and goals are formed in an ongoing learning process, which is shaped by the effectuation processes. As such, understanding how entrepreneurs learn to think entrepreneurially requires an exploration of "how deep knowledge structures are changing … and … how entrepreneurial thinkers structure and learn to structure their knowledge, tacit or otherwise …" (Krueger, 2007).

This represents a new way of thinking about entrepreneurial action. We can look to the stream of risk and uncertainty research from Knight (1921) onwards that has characterised

entrepreneurial rationality as investment decision-making when outcomes are probabilistic. Recognising that this is a unique, historically-situated perspective raises a prospect that there may be alternative ways of understanding entrepreneurship that call for other perspectives on risk and rationality. Risk arises from the inability to predict future environmental states (Miller, 2007). Under conditions of uncertainty, less reliable and verifiable information about the underlying distribution of outcomes is available than under conditions of risk (Knight, 1921; Simon, 1973; deMattos *et al.*, 2012). Evidence suggests that many decision-makers are systematically over-optimistic about their future prospects and that founders are especially prone to over-optimism (Cooper *et al.*, 1988; Camerer and Lavallo, 1989; Alvarez and Parker, 2009). Knight's discussion of uncertainty provides a striking anticipation of modern treatment of market failure (LeRoy and Singell, 1987. p. 396).

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

Three recent papers contribute to this debate. Francioni *et al.* (2015, p. 2240) found that a more risk-seeking attitude brings the decision-maker to follow a more rational approach to the key strategic decisions. However, in cases where the decision-maker is not fearful of the risks pertaining to relevant strategic decisions they face them with a high awareness and pay attention to the choices they make. This result contrasts the idea that small entrepreneurs instinctively follow their intuition (Musso and Francioni, 2014). Moreover, Maine *et al.* (2015, p. 65) suggest that entrepreneurs may be able to enhance their resilience to external shocks and their ability to exploit contingencies through flexibility, thus employing effectuation-based decision-making; however, they seem to find that the entrepreneurs act rationally by, for instance, avoiding major investment decisions. Nevertheless, Maine *et al.* (2015, p. 67) note that in highly uncertain environments entrepreneurs become more causal in

analysis and decision-making, and their firm's strategy becomes more rigid, less experimental and less resilient.

Nevertheless, Wu and Knott (2006) suggest that entrepreneurs are risk-averse regarding demand uncertainty but over-confident regarding their own ability, resulting in apparent risk-seeking behaviour. Dyer *et al.* (2008, p. 318) explain that entrepreneurs are prone to cognitive biases, notably the over-confidence bias and representativeness bias (Parlich and Bagby, 1995; Busenitz and Barney 1997; Zhao, 2009; Dinur, 2011). These biases act by motivating entrepreneurs to persist in pursuing new venture ideas, increasing the probability of venture creation. The over-confidence bias arises when individuals rank their own positive qualities or virtues as being higher than they really are. A quality which tends to be overestimated is the ability to forecast the future, and this over-confidence leads individuals to underestimate possible uncertainties in a decision environment (Tversky and Kahneman, 1974; Sarasvathy, 1999). Knight (1921, p. 220) expressed an appreciation for the distinction between "ignorance" and "real indeterminateness", choosing the latter as his typology of probability situations.

This paper aims to answer the following research question: What logics do decision-makers use when faced with a critical threat or a crisis? Solutions come from the basic cognitive processes that allow the entrepreneur to operate on and use information in new ways (Baron, 2007, p. 169). From where do they get this information? Dyer *et al.* (2008) argue that entrepreneurs may have superior access to information because they have larger and more diverse social networks that provide a conduit for information. Renzulli *et al.* (2000) found that entrepreneurs with networks that spanned multiple domains of social life saw opportunities more frequently. Moreover, Baron (2007, p. 172) has claimed that entrepreneurs' social skills (their ability to interact with others in an effective manner) and their social networks (networks of personal relationships with others) help them to acquire the resources they need to make decisions (Aldrich, 1999; Andressen, 2011). Such thinking is consistent with that of social network theorists who have argued that the structure of one's social relationships determines the quantity of information, the quality of information, and how rapidly information can be acquired. In terms of entrepreneurial decision-making this is important and critical to discovering entrepreneurial opportunities (Marsden, 1983; Aldrich and Zimmer, 1986; Rodan and Galunic, 2004; Uzzi and Spiro, 2005). This resonates with research, such as a comparative study of entrepreneurs and executives on opportunity search

where Kaish and Gilad (1991) found that entrepreneurs spent significantly more time searching for information through non-verbal scanning in their "off hours". A related stream of research on cognition points to entrepreneurs being superior at pattern recognition – noticing connections between trends, changes and events which appear, at first glance, to be unrelated (Baron, 2006). Baron (2006, p. 171), building on prior psychological research (i.e. Sternberg and Davidson, 1995), notes that pattern recognition involves "noticing meaningful patterns in complex events or changes, includes: (1) recognizing links between trends, changes and events that appear at first glance to be unconnected; and (2) noticing that these connections [come] from an identifiable pattern". Pattern recognition can therefore play an important role in entrepreneurial alertness and suggests that some individuals may be more or less "alert" to various opportunities because they possess cognitive frameworks that permit them to notice emerging opportunities even when they are not actively searching for them. Their frameworks serve as templates that assist such persons to recognise emergent patterns and opportunities related to them.

This type of thinking suggests that the logic to entrepreneurial decision-making depends on a range of factors, in particular that individuals differ greatly in terms of the cognitive frameworks they possess. These frameworks, while useful in helping them to "connect the dots" between seemingly unrelated events or trends, are formed through interactions with others in social networks and their subjective beliefs, values and attitudes that develop over time and which may change over time on the basis of previous decisions and the acceptance of new information. As Miller (2007) argues, entrepreneurial decision-making is also influenced by the creative identity of the individual. Here creativity is understood as proceeding on the basis of problem-solving heuristics, which draw upon prior knowledge (e.g. through novel re-combinations) or as an expression of personal freedom (making creativity different from either deterministic or random acts). As such, creativity draws upon past learning but is not fully constrained by it. Identity also provides a critical logic, and entrepreneurial events arise not only from looking forward (i.e. anticipating future prospects) and looking backward (i.e. learning from experience) but also from looking inward (as an implication of one's sense of self) (Miller, 2007, p. 66).

If we acknowledge that entrepreneurs operate within a dynamic social system that incorporates them as individuals in relation to others who can influence and can be influenced by decisions made within the business, then we can develop a typology of the logic of

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

managing a crisis within their own business and acting as mentors to local enterprises dealing with a crisis. Of these, seven agreed to participate in the study, corresponding to 35% of available respondents. Adopting Glaser and Strauss (1967), theoretical saturation was achieved with just seven case studies, as the last few cases gave very similar responses as to how the expert entrepreneurs were dealing with specific critical events within their business. Appendix 1 provides the demographics of the participants and their firms. The interviews were conducted in the summer of 2008, just at the start of the Global Financial Crisis. The purpose of the interview with the business founder/owner was to elicit information about their business and the role they played within the business on a day-to-day basis, as well as the basis for their business. Interviewees were questioned about how they thought they made decisions and where they drew information from to help them make decisions, as well as how as mentors they were advising other businesses to prepare for and deal with the consequences of crises. Through this process of questioning the focus turned to a critical incident they experienced in the life of their business and the businesses they were advising.

The use of the critical incident technique (CIT) methodology helped to understand how entrepreneurs make decisions at the time of crisis. Flanagan (1953, p. 335) argues that the "critical incident technique is essentially a procedure for gathering certain important facts concerning behaviour in defined situations". To that effect the interviewee was asked to describe the incident, why they saw it as being a critical incident and then the process by which they resolved the problem at the heart of the incident. More recently, work has been undertaken by Chell and Pittaway (1998), who build on McClelland (1987) in using a technique termed the "Behavioural Event Interview" to identify behaviours associated with business development and entrepreneurship. As Chell and Pittaway (1998, p. 24) illustrate, "… studies in the tradition of Flanagan have assumed the tenets of the scientific method and used the CIT as a quantitative method …" Their study proposed six elements of the research process relevant to CIT, which are adopted within this study:

(i) gaining access

(ii) focusing the theme and giving an account of oneself as researcher to the respondent

(iii) introducing the CIT method

(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".

In conducting the interview analysis a constant comparative method, as described by Browning *et al.* (1995, p. 121), was used to extract categories and themes from the interview data. To aid the qualitative data analysis process the transcripts were entered into NVivo and this software was used to help reveal patterns and themes associated with the entrepreneurial decision-making process, as well as the sources of information and support they drew upon. The transcripts were initially coded by one researcher to attribute the decision-making into effectual or rational. Through cross–case comparison evidence of the overlap between rational and effectual dimensions were also established in the data. This process of constant comparison enabled the researchers to signpost the decision-making patterns and associate the evidence with the entrepreneurial logics from the proposed typology, as this was carried out by two researchers testing for inter-coder reliability. To illustrate the three positions on the developed typology, three vignette cases are included, one each for Experiential, Networked Anticipatory and Network Experiential. These have been chosen on the basis of the fit with the typology and the level of expertise the respondents had, based on the age of their founded firms, whether they have experienced a particular critical incident internally or externally. and if that had an effect on their business and entrepreneurial developments.

This study is subject to the general limitations of generalisability associated with field research, which are well documented (Eisenhardt, 1989). However, the organisation and structuring of the data around common themes enables the building of multiple case studies where similarities and differences can be explored. Multiple respondents provide a stronger base for theory-building (Yin, 1994) and the findings are generalisable to theory (Eisenhardt, 1989).

4. Key findings and case study illustrations

The decision-making process and the logic underpinning those decisions were explored by controlling the interviews around a particular critical incident pertinent to the survival of the entrepreneurial venture. Where entrepreneurs draw information from to help them make decisions was also explored. Table 1 shows the examples of critical incidents identified by entrepreneurs as those that challenged their thinking, and made them make decisions within their organisation. It can be seen that some of the more critical problems were those that are generically faced by any business, for example: a *fire in the factory*, which had an unprecedented effect on the firm's ability to deliver on schedule; the *loss of key customers*, which created a lack of financial resources within the business and put the business in a

severe financial situation; and *problems with market entry* for a newly developed business, as the industry it sought to enter had high barriers to entry that were not apparent based on the research undertaken.

Insert Table 1 about here

Table 1 assigns specific types of entrepreneurial logic used to support each entrepreneur's decision-making. The interviewees were asked about how they thought they made decisions following the critical incident schema. A set of more detailed excerpts in Table 2 and Table 3 represents the summary of the thematic analysis. A number of key statements made by the expert entrepreneurs were identified in relation to how they thought they dealt with a critical incident, enabling the process of their decision-making as they dealt with the critical incident to be mapped out in relation to key justifications, embedded in rational and intuitive principles.

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Insert Table 2 about here

Insert Table 3 about here

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The quotes in Tables 2 and 3 are illustrative of the effectual (intuitive) and more rational approaches to solving problems in relation to critical incidents.

Table 4 maps out further excerpts from respondents, indicating the overlap between rational judgements and more intuitive effectual principals that formed the basis for their decision-making. This second-level coding, using the constant comparative method, provided support for classifying the critical incidents and the associated entrepreneurial logic utilised in decision-making.

Insert Table 4 about here

It is clear that there is a degree of effectuation as well as causation in the logic underpinning respondents' decision-making. However, it is also apparent that effectual and causal thinking are not mutually exclusive, and both logics inform decision-making at different points in time. Moreover, it was apparent from the interviews that decisions were not made by simply looking *inwards*. In each of the cases the entrepreneur consulted another person either associated with their business or family, for example "*I talk to my wife, she works and she has HR issues as well, so we often swap of [sic] stories*" (CH, Vignette 2), or who had particular expertise to help them make the "right" decision.

Three vignettes have been selected to illustrate the decision-making around critical incidents in more detail. These provide evidence underpinning the types of logic outlined in the typology of entrepreneurial logic.

Vignette 1: BE's response to a fire in the factory – Experiential Logic

In the case of BE the critical incident was a fire that destroyed the entire factory and all its output. This was devastating, and signalled a complete end to the business. However, BE refused to accept the loss adjustor's decision on the insurance payout for the business. It was through his own dogged determination, and after others in the business had given up, that he sat down and combed through the insurance documents trying to find a solution. As he explains:

> *… we had a massive fire which melted the whole production operation and we thought the world had ended. It was terrible. I sat up thinking what's the way out of this? … Some chaps even left the company, I think they thought we couldn't recover … we were offered by our insurance company damages to rebuild the equipment, damages were about £150 000. But of course we lost trade in that period. So what I did was search through our insurance policy and I found a small clause in it that meant we could call in a loss adjuster and through the loss adjuster we got 3.2*

million. That was the difference. As a result we were offered by our insurance company damages to rebuild the equipment, the building – all the damage … I just happened to spot the solution by searching and searching.

However, while BE drew upon his experience to find a solution, he then needed to have that solution confirmed by his Board. As he explained:

I came to a conclusion, my conclusion as to what the answer was. I then asked my Board before taking any actions. I said to the executive Board, "This is what I came up with, what do you think? Throw rocks at this" … We all then came to the same conclusion to call in the loss adjuster. The board agreed. If you try to fly solo – it doesn't work …

Vignette 2: CH's response to a key customer going bankrupt – Networked Experiential Logic

In the case of CH the critical incident was a financial damage caused by a key customer going bankrupt. This was an unexpected event and it had severe consequences on the business's cash flow. As CH explains:

… It took us by surprise. It was a company that grew like hell and we suspected it was out of control, but while it was growing we didn't worry. We were making a lot of money out of it, so when it went bust … they had a debt of £50 000. As a result we had [a] 25% drop in sales, so I went into red and so … I was wondering whether this drop in sales would leave us so low in terms of margin, that we would not be profitable. So it was a turmoil! I had to act fairly decisively … it was probably intuition … I knew I had to lay off people in the warehouse …

Although CH came up with a solution alone and the time was pressing for it to be implemented, he consulted his directors, who were not keen on engaging with this type of decision. As CH explains:

What I did is bounce some of my ideas off the management team to see whether I had forgotten something or if there was something I still had to do. I gave them an opportunity to contribute to the decision and perhaps fine tune it … Did they really contribute? I think they were shell shocked and did not really want to partake in the exercise … But I had to let them know what we were doing. And, once again, I was

just checking with them. I needed to know if I was wrong or forgetting something, these were the steps I took.

CH also talked about the wider impact and the consequences of these types of decisions and the rationale for choosing the person to be fired:

But we operate in a small town, so it is not just the business you think about, it will have a big impact on the person also … so there are consequences. In a small town you need to be careful about laying people off. And the person I had to lose … I did talk to the other managers in the end, and eventually we made it together. We isolated the person who was not very flexible; we were moving to using IT with our clients and this person was struggling to cope with all that. Bloody good at the rest of the job, fantastic organiser, but eventually I had to let them go. That person eventually ended up working for one of our clients …

Vignette 3: LA's considerations about re-branding of the business – Networked Anticipatory Logic

In the case of LA the critical incident was to do with a decision to re-brand the business and ensure that it more eloquently represented the business they were in. As LA explains:

… the most critical issue was re-branding. This caused a number of conflicts and made us have discussions every day about which logo we should use and did it really depict the brand we wanted it to, and so on. The logo was crucial for many reasons with the company being split between printing and designing, and we were trying to incorporate the design into becoming more important as that was where the value-added was going to. That logo needed to be an example of what the design studio was capable of, but also, I think, in terms of colour it needed to evoke trust and give a sense of creativity and convey the innovative nature of the company as well …

It was not a decision that was made by LA alone. The initial decision was conceived between the partners and the consultant; however, in order to ensure there were positive consequences to their decision a number of other parties were consulted. LA explains:

The initial decision as to whether to re-brand was really between me, Steve and our consultant. And to some extent Marcus who was the production manager. But when

> *the decision has been made to re-brand, then the choice of logos and the rest of the marketing material, but particularly the logo, we had to get the other staff involved, on the shop floor, we wanted them to give us their opinion, because we needed to bring them along with the re-branding and make them feel part of it, and it[’s] always good to get other people’s perceptions. It took a long time to get there, but we got there in the end …*

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

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

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

5. Discussion

The purpose of the study was to examine the emerging approaches entrepreneurs take to decision-making in the context of a critical incident. To achieve this, research on decision-making was examined, particularly that of Sarasvathy (2001a), where she distinguishes between causation and effectuation and argues that effectual logic defines entrepreneurial decision-making. In other words, she argues that amongst expert entrepreneurs it is an

intuitive logic that predominates in decision-making. However, recently there have been criticisms of this approach by Arend *et al.* (2015) and Miller (2007), in particular arguing that entrepreneurs cannot be isolated when exploring decision-making, as the social context in which they operate must be taken into account. A typology is developed here, categorising the logic of entrepreneurial decision-making based on effectual or causal logic as well as from where entrepreneurs draw information – internally or externally. The types are:

1. Anticipatory Logic, where the entrepreneur anticipates future prospects based on what they know; in other words they think causally and look inwards.
2. Experiential Logic, where the entrepreneur looks inwards and draws the solutions to their problem from their own experience and is therefore thinking effectually.
3. Networked Anticipatory Logic, where the entrepreneur anticipates the future and checks with those from within their wider social network and thus draws knowledge by looking outward.
4. Networked Experiential Logic, where the entrepreneur draws on their own experience as well as that within their wider social network to find a solution to their problem.

This typology allows the different approaches to decision-making used by entrepreneurs when they respond to a critical incident to be evaluated. It suggests that when entrepreneurs make a decision by themselves, whether relying on rational reasoning or intuition, this decision is likely to be less informed than if they consult others more widely from their social network. There is greater risk involved in not consulting others – not that others are able to provide a definite solution. It may mean that others operate in more of a social comfort role in this critical decision-making process. This does not change the level of uncertainty that Knight (1921) identified, but instead helps the entrepreneurs to manage uncertainty down to risk.

The interviews with seven expert entrepreneurs who operated a range of businesses differing in size and age revealed that many of them think that their decision-making is based on intuition or effectual logic. It became apparent from the interviews that intuition played a key role in the decision-making process, and came from either an innate ability and a more subconscious reaction to a crisis situation, or general experience that had been accumulated in response to problems solved by these entrepreneurs in the past. Past decisions act as learning experiences and inform contemporary decisions and, as such, a heuristic is developed and used. Intuition provides the initial stimulus for a decision, and all seven interviewees

mentioned intuition as a part of their decision-making process. However, what transpired was that a decision-maker who was aware of intuitive influences at the decision formulation stage was likely to moderate their instinct with a consideration of rational information and alternative solutions. Indeed, when exploring decision-making in response to a critical incident no examples were found of the problem being dealt with using intuition or effectuation alone.

The results indicate that the logic underpinning entrepreneurial decision-making depends on the nature and seriousness of the problem, and the entrepreneur's experience and their consideration of the future consequences, which result from either looking *inward* or looking *outward*. Similar to the findings of Francioni *et al.* (2015), it was found here that entrepreneurs tended towards causal logic when "the stakes were high" and the decision could have an effect on their firm's survival. However, the contribution of this research to the debate is that in such situations they all sought advice from trusted "others" within their social network, and either weighed up alternatives before acting or sought consent for their decision. Moreover, another unusual response observed within the sample was the decision to rationalise the decision that was already made with the trusted network, as if to "rubber-stamp" it. This may represent a political dimension that Maine *et al.* (2015) explored but found little support for within their study. A mixture of causal and effectual logic was therefore evident in many decisions when entrepreneurs were looking outward to their network. These results echo some of the findings from Francioni *et al.* (2015), who identified that decision-makers tend to follow a more rational logic depending on their education level, risk attitude, and the firm's past performance.

Hence, the main contribution this research makes is that logics that underpin decision-making of entrepreneurs have not previously been explored in the context of responding to a threat or critical incident. Schumpeter stated, in Neubauer and Lank (1998, p.176), that "the success of everything depends on intuition, the capacities of seeing things in a way which afterwards proves to be true, even though it cannot be established at the moment …". However, it is a high-risk strategy to rely entirely on intuition. For appropriate instinctive decisions and actions to crisis situations, and to situations that require an instant response, extensive practice is required to indicate that the entrepreneur is ready to take the plunge, whereas for decisions where there is more time available there should be procedures in place which will allow for the "right" decision to emerge. It is problematic to suggest there is a mutually

exclusive choice between causal and effectual logic when it comes to decision-making. Entrepreneurs need to be able to analyse a problem systematically (using causal logic) and to respond to situations rapidly (driven by effectuation). Successful entrepreneurs do not choose between logics; instead, they use these as part of an arsenal of skills and apply each when it is appropriate.

6. Conclusion

The decisions entrepreneurs make can shape and define their business, as well as their own destiny. 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 – can help to structure the support they need. The research carried out by the major authors in the field informed by Sarasvathy (2001a,b), and lately by Maine *et al.* (2015) and Francioni *et al.* (2015), tends to rely on the individualistic approaches to decision-making, and examines the expert entrepreneurs as if they are isolated, rather than embedded within the social context. Might this be due to the more individualistic behaviour amongst the respondents within their studies? Such biases could be explored in future research.

The present findings, somewhat contrary to recent work on entrepreneurial decision-making, suggest that when it comes to an important decision that can have major consequences, entrepreneurs rely on their intuition to generate a solution to the problem and then tend to consult their wider network; by doing so they share the responsibility for decisions, seek confirmation for their ideas or utilise these connections as social comfort. In support terms this may mean facilitating access to other experts. Knight (1921) has contributed to a thorough analysis of motivations and characteristics needed to become a successful entrepreneur: “a successful uncertainty bearer and judgemental decision maker” (Van Praag, 1999, p. 322). The typology presented here attempts to capture this, seeking to explain the types of logic used by entrepreneurs when making decisions.

While the typology needs to be tested using a larger sample we did not find entrepreneurs who used effectual logic alone. We have clear evidence of the decision-making and rationalisation logic embedded within the social context of trusted or expert networks that seems to be more useful in times of a critical event. This raises a question about the role of effectuation and how it is used in the entrepreneur’s arsenal of skills. Decisions have consequences beyond the individual alone, which experienced entrepreneurs are aware of. By

looking outwards, entrepreneurs may be able to minimise risks as well as to overcome the biases they hold and bring to decisions. This research points to an increasingly important integration of social context when decisions are critical to survival. Moreover, critical incidents might be significantly important for the life of the business, and how entrepreneurs are learning from them and interacting with their networks can help society to make sustainable decisions that can be successful in the long run.

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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

Supporting evidence (data analysis)	*Effectuation principles*
BE: "it is like having a set of cards in front of you and you play it accordingly" 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 ..."	Affordable Loss
BE: "most entrepreneurs don't think in straight lines" 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"	Acceptable Risk Heuristic
BE: "if my antenna says don't do something, I stop" 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 ..."	Logic of Control
BE: "most times I've been right; sometimes I have been quite wrong" 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"	Evaluation

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

Supporting evidence (data analysis)	*Rational principles*
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

Table 4: Evidence of overlap of Causal and Effectual logics

	Affordable Loss	*Acceptable Risk Heuristic*	*Logic of Control*	*Evaluation*
Cost	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"		
Balancing Act	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"	
Measuring the Situation	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"
Verification Process	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"
Expert Judgement		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 Anticipating future prospects	**Looking backward** Learning from experience
Looking inward An implication of one's sense of self	Anticipatory Logic *Causal*	Experiential Logic *Effectual*
Looking outward An implication of one's outside network of trusted people	Networked Anticipatory Logic *Networked Causal*	Networked Experiential Logic *Networked Effectual*