



Decision and design heuristics in the context of entrepreneurial uncertainties

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ABSTRACT

Building on a perspective of the entrepreneur as an interpretive agent, we argue that in situations where there is absolute uncertainty, heuristics are useful design rules that aid entrepreneurs' judgment by synthesizing mental models and expectations to enable purposeful action. This is because decisions under absolute uncertainty pertain to subjective judgments of *both* outcomes and options. In contrast, objectively rational decision heuristics are useful under predictable risk. Our argument provides balance to the extant literature, which, due to the overemphasis on biases and an unrealistic view of uncertainty in entrepreneurial decision making, often overlooks the positive role of heuristics.

1. Introduction

Research on entrepreneurial decision making has found that entrepreneurs often rely on non-objectively optimal decision-making processes, and particularly on heuristics (Busenitz and Barney, 1997; Pinto, 2014). Prominent examples of such strategies include effectuation (e.g. Sarasvathy, 2009), bricolage (e.g. Baker and Nelson, 2005), and, to some extent, frugal decision-making approaches (Artinger et al., 2015). Yet, despite the significant impact of these approaches in both the fields of strategy and entrepreneurship, and recent studies of the conditions in which heuristics can be an effective and rational decision-making strategy (see Bingham and Eisenhardt, 2011; Maitland and Sammartino, 2015), research on entrepreneurial heuristics remains both sparse (Shepherd et al., 2015) and focused largely on biases (Cossette, 2014). Consequently, the positive side of heuristics remains both relatively under-researched and underestimated in the study of entrepreneurial decision making.

This relative lack of attention to the positive aspect of heuristics can be explained by two factors. First, because the origins of research on heuristics are in the field of psychology, the use of entrepreneurial heuristics is frequently conflated with biases (e.g., see Burmeister and Schade, 2007; Busenitz and Barney, 1997). Consequently, use of heuristics is often thought to lead to suboptimal results. Second, this line of research often conceptualizes uncertainty as mathematically tractable (Schwenk, 1984). That is, where a set of potential options and outcomes can be determined and the results of each decision can be compared to the optimal decision (e.g., Tversky and Kahneman, 1974 and much of the related research published since in the field of cognitive psychology). While useful in some contexts of strategic decision making, this conceptualization is limited in most entrepreneurial contexts, where both the set of potential outcomes and the set of potential options remain open and subjective, hence an optimum outcome cannot be quantified (Packard et al., 2017). In such contexts, decisions are underpinned by subjective processes such as imagination and creativity that help entrepreneurs to develop and work towards *their* desired purposes (Mathews, 2010; Packard, 2017). Consequently, such decisions would not necessarily be considered optimal by a theoretical “objective omnipotent observer”.

However, uncertainty in decision making can be conceptualized as a spectrum spanning two extremes: one, at which options and

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outcomes are identified, and causal links between the two can be assessed objectively (i.e., risk), and one where no such information can be determined objectively and where potential options and outcomes need to be populated subjectively (i.e., absolute uncertainty). Consequently, we posit that in the latter context, which is the highest level of *true* uncertainty conceptualized by Knight (1921), heuristics are actionable simple rules that synthesize the entrepreneur's subjective knowledge, expectations, and vision, and for which optimal outcomes cannot be determined by mathematical methods. Instead, we expect the entrepreneur to continually shape the range of possible outcomes through purposeful imagination. In the context of risk, however, where decisions are restricted to closed sets of options and outcomes, decision makers can, at least in theory, draw on mathematically objective decision-making strategies. However, in practice, because of limitations imposed by time or cognition, entrepreneurs often tend to rely on *decision heuristics*; i.e. simplifying processes that help them efficiently deal with the predictable complexity that characterizes this context.

To develop our argument, we first outline how the literature on entrepreneurship considers the strategic use of heuristics. We then add to the current state of this literature by introducing a distinction between *decision heuristics* and *design heuristics*,¹ where each of these ideal-types is adapted to a different end of the uncertainty spectrum. Finally, we discuss the theoretical and practical implications of this classification of heuristics.

2. Heuristics in entrepreneurial contexts: risk, uncertainty, and the nature of decision-making processes

Most of the past research on heuristics has focused on biases as deviations from optimal decisions and outcomes (Cossette, 2014). Because of this focus, current research typically portrays heuristics somewhat negatively. For example, Busenitz and Barney (1997, p. 10) state that heuristics merely provide an effective way “to approximate the appropriate decisions”, and Schoemaker and Russo (1993) see heuristics as a lower-quality approach to decision making. Milkman et al. (2009) and Pinto (2014) note that such decisions need to be “debiased” to be valid. Nonetheless, the fact that entrepreneurs rely more often on heuristics than managers in large organizations do (Busenitz and Barney, 1994, 1997) suggests that heuristics may also have positive attributes, at least in entrepreneurial contexts. One reason entrepreneurs rely on heuristics is that they often operate in uncertain and unpredictable environments, in which optimal outcomes and feasible options are subjective (Packard, 2017). Hence, entrepreneurs must rely on mental models to piece together previously unconnected information (Mitchell et al., 2002), and heuristics offer a viable, and often effective, way to make these connections and reach decisions.

However, when applied to entrepreneurship, research on heuristics frequently fails to account for this specific context. It has not, for instance, considered the varying levels of uncertainty that entrepreneurs face, nor has it distinguished between risk and absolute uncertainty (cf. Dequech, 2011; Packard et al., 2017). This distinction is important. When there is only risk (i.e., in mathematically tractable contexts), explicit information can inform an optimizing decision-making model that is designed to achieve the expected optimal outcome(s) (Artinger et al., 2015). In such a situation the decision maker needs only to combine resources in the most efficient way to maximize economic rent or competitive advantage (see Peteraf, 1993), often relying on a strategy of economizing (Mathews, 2010). The causal mechanisms behind the outcome can be logically deduced.

Under risk, and when analytical methods are not feasible due to cognitive or time constraints, heuristics can be perceived as a trade-off between effort and accuracy (Payne et al., 1988) that simplify complex links of causality between available options and potential outcomes. In contrast, under absolute uncertainty, the set of potential options and outcomes are often open (Packard et al., 2017), highly subjective (Foss and Klein, 2012; Knight, 1921), and consequently not amenable to probabilistic decision making. Entrepreneurs coping with absolute uncertainty must, for example, subjectively anticipate how potential customers might perceive the potential future value of a resource combination.

In this paper, following Packard et al. (2017), we use the term *absolute uncertainty* to describe the situation where both the set of options and outcomes remain open and, to some extent, unconstrained. That is, from a mathematical perspective, optimal options or outcomes cannot be calculated when approached from a purely positivist perspective (i.e., an omnipotent observer). However, from an interpretivist perspective, such an open set of options and outcomes is perceived by an entrepreneur as a range of opportunities that she can act upon with personal preferences distinguishing which are most desirable (but not necessarily mathematically optimal). For the entrepreneur, open options and outcomes can be positively depicted as potential opportunities populated by imagination and vision. In such circumstances, entrepreneurs must rely on their own mental models, a “simulation of the world fleshed out with all our relevant knowledge” (Johnson-Laird, 2010, p. 18249). But for an external observer, absolute uncertainty makes it impossible to establish normative baselines, even *post hoc*. From this perspective, heuristics provide a flexible way to make decisions under conditions of absolute uncertainty when there is no objectively optimal solution. The entrepreneur's subjective expectations, rather than an objective benchmark, form the basis on which the outcome can be assessed. Instead of aiming towards clearly defined goals, the entrepreneur follows her purposes, which allows room for creativity and evolution (Faust, 2004). In contrast, a perspective that uses analytical methods will be limited to assessing only what is measurable, in this case deviations from optima.

Because the results of the entrepreneur's expectations under absolute uncertainty are not objectively assessable, a different research approach is needed to uncover insights about judgment and decision-making processes under such conditions. First, we need to embrace the subjectivity of entrepreneurial mental models and expectations (Lachmann, 1943). Second, we must strive for empathic accuracy, in which “observation, memory, knowledge, and reasoning are combined to yield insights in the thoughts and feelings of others” (McMullen, 2015, p. 668). Under absolute uncertainty, decision making entails judgment in which a set of expected subjective outcomes, and the options used to reach these outcomes, are elaborated on. In this context, the idea of an

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