

I LIKE HOW YOU THINK: THE ROLE OF COGNITIVE SIMILARITY AS A DECISION BIAS

CHARLES Y. MURNIEKS

University of Colorado, Leeds School of Business
UCB 419; Boulder, CO 80309
(T) 303-492-5636 (E) chuck.murnieks@colorado.edu

J. MICHAEL HAYNIE

Syracuse University, Whitman School of Management

ROBERT E. WILTBANK

Willamette University, Atkinson School of Management

TROY HARTING

United States Air Force Academy, Department of Management

INTRODUCTION

Psychologists have long been interested in the effects of *similarity* as a bias in the decision-making process. Research generally suggests that similarity attracts (Byrne, 1971); and in decision-making contexts, research demonstrates that decision-makers prefer objects, persons, or concepts that resemble or are consistent with what they believe to be true about themselves (McPherson, Smith-Lovin, & Cook, 2001). Said otherwise, ‘birds of a feather’ do flock together; decision-makers demonstrate a bias towards individuals similar to themselves (Byrne, 1971; 1997; Harrison, Price & Bell, 1998). While scholars confirm that similarity effects play an important role in human interaction, the extant research has generally overlooked the role of similarity in cognitive processes – *how people think* – as a dimension that may promote attractiveness between two individuals, and subsequently influence the decision-making process. Extant research fails to disentangle the effects of similarity across cognitive outcomes (resultant attitudes and judgments) from the effects emanating from the underlying *process* or *pattern of reasoning* responsible for those outcomes. Not addressed are questions focused on the extent to which shared processes or patterns of reasoning (cognitive similarity) influence decisions.

We attempt to investigate this question in a conservative decision environment where cognitive outcomes are purported to stand central in the decision process and where the cognitive processes should play an *insignificant* role in determining decision outcomes (MacMillan, Siegel & Subbanarasimha, 1985). Specifically, we analyze the decision policies of a sample of venture capitalists engaged in the process of evaluating the attractiveness of a series of hypothetical venture ‘deals.’ We test the extent to which similarity in reasoning patterns – between the VC and the entrepreneur – relates to the venture capitalists’ investment decisions.

THEORY AND HYPOTHESES DEVELOPMENT

In this paper, we investigate whether similarity across cognitive processes systematically influences decision-making. We establish the theoretical foundation for our argument on the body of work surrounding the ‘similarity effect’. The similarity effect states that as similarity

between two individuals increases, so does attraction (Byrne, 1971; 1997; Lazarsfeld & Merton, 1954). This effect has been consistently replicated (Tsui & O'Reilly, 1989), but not yet examined for similarities across cognitive processes. Our extension of the work on the similarity effect into the cognitive process domain involves a subtle, but important distinction. The majority of the studies conducted on the similarity effect test elements like attitudes or judgments (Byrne, 1997; 1971; Harrison et al., 1998), both of which we categorize as *outcomes* or end products of some cognitive process of evaluation. While related to the cognitive process, an attitude or judgment is not equivalent to the process itself. Two individuals may have the same attitude about something, but may have reached that attitude by extremely different cognitive processes. Does similarity in the process have comparable effects to those associated primarily with similarity in the outcome? We theorize about the role of cognitive process evaluations on decision-making by drawing from related work in social psychology.

Recent research surrounding regulatory focus theory indicates that decision-makers can incorporate both process and outcome criteria into evaluations. Regulatory focus is a self-regulation orientation that differentiates between being motivated to achieve positive outcomes or to avoid negative ones (Higgins, 1998). Regulatory fit is achieved when an individual pursues a particular goal in a manner that matches his or her regulatory orientation (Cesario, Grant & Higgins, 2004; Higgins, 2000). Regulatory fit studies have shown that individuals evaluate the same outcomes differently, depending on the regulatory process involved. Across the studies, when the regulatory process associated with an object under evaluation matches the regulatory orientation of the individual conducting the evaluation, the perceived value is higher. Conversely, when there is no fit between processes, the evaluation is less favorable. While we are not concerned specifically with regulatory focus theory in this paper, this research indicates that cognitive processes have important effects on evaluations. Importantly, consistent with the logic of similarity effect theories, this research indicates that individuals tend to give higher evaluations to outcomes reached by processes that match their own preferred approach towards some ending evaluation (Higgins, 2000). By integrating work on the similarity effect with that on cognitive processes in regulatory fit, we argue that decision makers will use both cognitive process and outcome information in their decision making efforts. We draw on the similarity effect to hypothesize a direction for this effect as well: decision-makers will tend to more favorably evaluate individuals who demonstrate similarity with their own cognitive processes.

H1: VCs will prefer investment opportunities represented by individuals whose pattern of cognitive reasoning is similar with their own, as opposed to those whose pattern of cognitive reasoning is not similar with their own.

While we argue that cognitive process is an important consideration in decision-making, we are mindful of the fact that outcome information also plays a crucial role in evaluations. Scholars have established a long and distinguished line of research examining the outcome decision criteria employed by VCs during investment evaluation (Hall & Hofer, 1993; MacMillan et al., 1985; MacMillan et al., 1987; Shepherd, 1999; Tyebjee & Bruno, 1984). One primary conclusion from this body of research is that the human capital of the founder is paramount (Shepherd & Zacharakis, 1999; Zopounidis, 1994). Human capital of the founder is often judged by examination of his or her relevant experience in both the new venture's industry and with previous start-ups (Bailey & Helfat, 2003; Castanias & Helfat 2001), as well as the founder's network of references. In general, VCs appear to mitigate investment uncertainty by backing individuals with superior human capital (Franke et al., 2006).

Not surprisingly, the economic details of a prospective deal are also critical to the evaluation of venture capitalists (Hall & Hofer, 1993; Tyebjee & Bruno, 1984). The economics of a deal include items such as financial rates of return, market growth, and competitive intensity. As one might expect, VCs tend to prefer deals characterized by higher rates of return, greater market growth, and some degree of protection from competitive rivalry (MacMillan et al., 1985; Shepherd, 1999). Given this robust research touting the importance of the outcome criteria of human capital and economic factors in investment decisions, we propose that VC's will prefer investments characterized by more proven founders and more favorable economics.

H2: VCs will prefer investment opportunities represented by founders possessing superior human capital factors rather than developing ones.

H3: VCs will prefer investment opportunities characterized by superior economic indicators rather than average economic indicators.

In addition to the three main effects proposed, there are likely to be two important moderating effects involved in a VC's evaluation of investment opportunities. First, we argue that cognitive similarity between the VC and the founder will positively moderate the effect of human capital factors on investment decisions. Cognitive similarity between the VC and the founder indicates resemblance in reasoning patterns or thought processes. Higgins (2000) shows that individuals who identify a similarity between their own preference for a cognitive process and the manner in which an object is presented for evaluation tend to give higher ratings to the object. Likewise, Cesario, Grant and Higgins (2003) show that the same characteristics of an object under evaluation are viewed more positively when cognitive similarity is present, versus when it is not. Thus, cognitive similarity acts to change the perception of an object. In the context of venture evaluation, we contend that cognitive similarity will work to influence the perception of the founder's human capital contribution to the investment opportunity. A founder who demonstrates cognitive similarity with a VC is more likely to be perceived in a positive light, and viewed as better positioned to make effective use of his or her human capital. Thus,

H4: The importance of human capital factors will become more positive when cognitive similarity is present between the founder and the venture capitalist.

The second important moderator we propose is the effect of human capital factors on the economic factors involved in overall deal evaluation. Research surrounding decision-making in highly uncertain contexts indicates that the weight placed on the abilities and skills of the founders leading the new ventures is extremely high (Zopounidis, 1994). VCs base their decisions on expectations that the founder will be able to mold, shape and exploit the economic elements of the environment in a way that benefits the new firm (Rutherford & Wand, 2006). Thus, decision criteria like economic factors are rarely evaluated in isolation, but are viewed in relation to the founder who will operate in that environment (Fried & Hisrich, 1994). Haynie (2005) shows that decision-makers in uncertain environments rate economic factors differently depending on their own experience and competencies, with greater similarities between personal and industry experience leading to higher evaluations. Thus, we expect that VCs ascribe more weight to economic elements when they perceive the founder in question has superior human capital to exploit those elements in favor of the start-up.

H5: The importance of economic factors will become more positive when the opportunity is also characterized by superior human capital factors.

METHODS

In this study, a conjoint methodology was employed to determine VCs' decision policies in the context of their evaluating a hypothetical founder and the associated venture. Conjoint methods allow for the decomposition of individual decisions into relevant attributes to determine which factors play significant roles in focal decisions (Shepherd & Zacharakis, 1999).

Data Gathering Method and Sample

For this study, we recruited participants who were actively involved as partners or associates at venture capital firms. Individuals were contacted by phone and by email to solicit their participation. Forty-nine VCs representing twenty different venture capital firms completed the experiment. The mean years of experience in the VC industry represented by our sample was 6.3 years, and the mean age range of the participants was 35-44 years. 82% of our sample was male, and 73% of the sample reported formal education at the master's degree level or higher.

Attributes, Levels and Variables

Since the focus of our study aims at the influence of process and outcome factors on decision-making, we asked participants to evaluate multiple investment opportunities given different sets of information. Each investment opportunity was described in terms of three attributes, each with two levels: (1) cognitive processes of the founder, (2) human capital characteristics of the founder, and (3) economics of the opportunity. These three attributes were selected because of their demonstrated relevance in venture evaluation (Shepherd & Zacharakis, 1999), and the levels were chosen to reflect the variation typical of venture capital environments (Shepherd, 1999). We developed our attributes and level descriptions by reviewing extant literature on VC decision-making. A description of each attribute is provided below.

Cognitive Characteristics: We operationalize cognitive processes through causal and effectual patterns of thinking (Sarasvathy, 2001). Our scenarios attempt to highlight the extent to which the participant balances predictive (causal) decision making with control-oriented (effectual) decision making (Wiltbank, Dew, Read & Sarasvathy, 2006). Prediction involves efforts to position the new venture for success based on forecasts for the development of that venture's market: estimating probabilities and consequences. Control, on the other hand, refers to efforts by the entrepreneurs to directly create or shape important market elements, often involving new products, influencing customer preferences, and forming new market structures. Although there are numerous alternatives by which to operationalize cognitive processes, we selected the causal/effectual dimension because of its proven applicability in uncertain decision environments like entrepreneurship (Sarasvathy, 2001).

We manipulated the cognitive process attributes in the investment profiles to reflect founders who think about the opportunity in a primarily causal or effectual manner. In a questionnaire administered to each participant after s/he had completed the conjoint instrument, we assessed his or her own use of prediction and control for comparison to the descriptions of the founders. When the participant emphasized causal decision-making, a 'similarity' with the founder occurred in the instances when the approach of the founder was also causal. The opposite (with effectual decision-making) was also considered similar. Cognitive similarity was operationalized as a continuous variable, with positive scores indicating a match and negative scores indicating a mismatch, between the dominant pattern of reasoning of the participant and each of the 16 investment scenarios.

Human Capital Characteristics: Human capital is often assessed empirically by analyzing an individual's work experience (Castanias & Helfat, 2001). As such, human capital in our instrument was indicated through creation of a 'personal' attribute that described the founder's experience and professional characteristics. This attribute captured how the founder was referred to the VC as well as the general industry and managerial experience of the founder. This variable was represented at two levels: *Developing*: the VC was made aware of the deal via a local networking event, and described an entrepreneur who was highly committed, and lacked experience in a start-up, and *Proven*: which described a deal that was referred to the VC by a trusted associate, and described an entrepreneur who has experience managing a start-up and is of high integrity. We limit the entrepreneurial management team in our stimuli to a single person to simplify the comparison of cognitive processes.

Economic Characteristics: Just as the human capital factors matter, the economics of the venture and market potential are important decision factors. We include an 'economic' variable in this study to encapsulate consideration of these characteristics. This is represented at two levels; *Solid*: describes an industry with significant growth potential and average profit, as well as a market with several legitimate competitors, and *Superior*: describes an industry with high growth potential and above average profit, as well as an opportunity with a defensible competitive position in the market.

Dependent Variable: The dependent variable is the probability that the VC would invest in the deal. After reading the elements encompassed by the cognitive, human capital, and economic factors which characterize each nascent venture, the VCs were asked to indicate how likely they would be to invest in that particular opportunity. A seven-point Likert scale was used to collect information on the dependent variable, with anchors set at "high" or "low".

Research Instrument and Experimental Design

In the conjoint experiment, participants evaluated 16 different opportunities. Each opportunity was described by the combination of the three attributes (cognitive process, personal, economic) at one of the two possible states, creating an orthogonal full factorial design of eight profiles. Those eight possible combinations were replicated, creating the 16 total opportunities to evaluate. The instrument was validated with in-depth interviews with VCs and academics prior to executing the full study. All individuals confirmed the face validity of both the attributes and the levels employed. We also conducted a pilot test using a sample of 30 undergraduate students to validate our research instrument as well as our testing procedure.

RESULTS

Each of the independent variables, "cognitive similarity", "economic", and "human capital", had significant ($p < 0.01$) positive coefficients, indicating that VCs tended to assign a higher probability of investing to opportunities with stronger descriptions. More specifically, where founders demonstrated a cognitive similarity to the participant's own reasoning pattern, VCs were significantly ($p < 0.01$) more likely to invest in that opportunity, supporting H1. Similarly, H2 and H3 were supported; opportunities exhibiting superior (vs average) economic traits and founders possessing proven (vs developing) human capital characteristics were more highly rated as "likely to invest" by the participants ($p < 0.01$).

In an attempt to further investigate the role of cognitive similarity in VC decision making, we analyzed the espoused importance of this factor among our participants. Each VC

was asked to rate, on a seven-point Likert scale, the importance of cognitive similarity, economic, and human capital factors during investment evaluation. Paired samples t-tests between these responses confirmed ($p < 0.05$) that the VCs in our sample rated cognitive similarity as the least important factor among the three investment criteria (cognitive similarity: $M = 3.90$, $SD = 1.56$; economic factor: $M = 5.31$, $SD = 0.93$; human capital factor: $M = 5.14$, $SD = 1.25$). A paired samples t-test between the economic and human capital factors found no significant difference ($p = 0.38$).

The VC decision process is also characterized by interactions. As hypothesized H4, the relationship between human capital characteristics of founders and VC investing probabilities, is more positive ($p < 0.01$) when the founders and VCs think alike (cognitive similarity). Being a proven founder influences investment decisions more positively when the founders *also* use similar reasoning patterns to the VC. Thus, H4 was supported. In addition, the relationship between economic factors of the opportunity and probability of investing is more positive ($p < 0.01$) when the founder is proven rather than developing, supporting H5.

DISCUSSION AND CONCLUSION

Similarity matters. Even in VC decisions, where observable characteristics like personal experience, referrals, and economic factors specific to the evaluation of opportunities are expected to dominate (Hall & Hofer, 1993), similarity in cognitive processes significantly increases the probability that the VC will invest. Existing research on the similarity effect in other settings suggested that this would be the case. However, empirically testing this hypothesis in the venture investing setting uniquely demonstrates the robustness of the effect. What makes the effect particularly important is that we evaluated the effect of similarity not between outcomes, (i.e. attitudes, judgments) but between cognitive processes. The similarity we are talking about is not between type of college, or age, or attitudes, etc., but the process by which the investor and founder make decisions about building a new venture. At times, this similarity effect is written off as a bias around factors not relevant to a particular decision, but driving attractiveness and affecting the decision nonetheless (Harrison et al., 1998). When one takes into account cognitive similarity, however, the dimensions can be much more tightly connected to the decision itself as it relates to the process by which the decision may be executed.

Also remarkable are the details for the effects of our three main variables on the probability of investing. Based on our reading of the VC literature, we had expected cognitive similarity to be overwhelmed by the human capital factors and the economic descriptions of the opportunities, and thus consider the test of the cognitive similarity to be a “high hurdle” in this setting. This reasoning is confirmed by the opinions of the VCs in our study who, as a group, rated cognitive similarity as the least important of the three investment criteria. The fact that cognitive similarity significantly influenced the attractiveness of investment opportunities, while controlling for both human capital and economic factors, provides a fascinating point of embarkation for additional investigation.

REFERENCES, FIGURES, AND TABLES AVAILABLE FROM THE AUTHORS

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