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### Recommended Citation

Krueger, Jr., N., Kickul, J., Gundry, L. K., Verma, R., & Wilson, F. (2009). *Discrete choices, trade-offs, and advantages: Modeling social venture opportunities and intentions* [Electronic version]. Retrieved [insert date], from Cornell University, School of Hotel Administration site: <http://scholarship.sha.cornell.edu/articles/570>

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# Discrete Choices, Trade-offs, and Advantages: Modeling Social Venture Opportunities and Intentions

## **Abstract**

[Excerpt] Our study is motivated by the fundamental question of whether social entrepreneurs differ from 'traditional' entrepreneurs. More concretely, is the way that aspiring entrepreneurs view social entrepreneurial opportunities different from the way they view more traditional (defined as primarily economic) entrepreneurial opportunities? Answering this question is critical to the advancement of the study of social entrepreneurship, and represents a powerful vehicle for demonstrating how the study of social entrepreneurship also advances our knowledge of traditional entrepreneurship.

## **Keywords**

social entrepreneurship, economic outcomes, customer satisfaction, employee satisfaction

## **Disciplines**

Business Administration, Management, and Operations | Entrepreneurial and Small Business Operations | Human Resources Management | Sales and Merchandising

## **Comments**

### **Required Publisher Statement**

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# Discrete Choices, Trade-offs, and Advantages: Modeling Social Venture Opportunities and Intentions

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## Introduction

Our study is motivated by the fundamental question of whether social entrepreneurs differ from 'traditional' entrepreneurs. More concretely, is the way that aspiring entrepreneurs view social entrepreneurial opportunities different from the way they view more traditional (defined as primarily economic) entrepreneurial opportunities? Answering this question is critical to the advancement of the study of social entrepreneurship, and represents a powerful vehicle for demonstrating how the study of social entrepreneurship also advances our knowledge of traditional entrepreneurship.

Entrepreneurship has been defined as the process of seeking and exploiting opportunities while undertaking calculated risks in this pursuit. As Cornwall and Naughton (2003) noted, measurement of a venture's effectiveness in pursuing and exploiting opportunity is often focused on entrepreneurial actions and behaviors related primarily to financial growth at the firm level of analysis. While economic outcomes (e.g. revenue growth, market share, and profitability) are important to assess, an increasing number of researchers and entrepreneurs are expanding the notion of 'pursuit of opportunity' to include social opportunity as well as economic opportunity (Cornwall & Naughton, 2003), leading to a wider range of measures used to assess entrepreneurial outcomes. For example, studies have measured success from the perspective of the entrepreneur that may include personal goals such as growth in total

employment (Levie, 1997); cash flow, permitting the distribution of bonuses or dividends (Cooper *et al.*, 1996); and overall satisfaction with running the business (Franquesa & Cooper, 1996). Other studies have taken the view that measuring success must include stakeholders' perspectives, such as customer and employee satisfaction (Sapienza & Grimm, 1997), and the business owner's contribution to economic and community development (Cornwall, 1998).

Therefore, researchers should consider whether entrepreneurship 'success' has historically been measured by outcomes that matter most to the entrepreneur. As Cooper (1995) asserted, entrepreneurship research measures those performance variables that are easiest to measure (from the perspective of the researcher), not necessarily the ones that are meaningful (from the perspective of the entrepreneur). Cornwall and Naughton (2003) highlighted an important gap in the literature stemming from the lack of attention paid to what success means to entrepreneurs. For example, success, as defined by an entrepreneur, may be purely about creating personal wealth, but it may also involve job creation, creating wealth for a broader set of stakeholders, creating and marketing a useful product or service, distributing wealth, or something even more deeply personal and principled. It is also suggested that no attempt has been made to examine what entrepreneurial success means taken from a moral perspective, let alone a spiritual or religious perspective (Cornwall & Naughton, 2003).

Previous research would seem to suggest that there is sufficient need for a broader definition of business value creation, and as policy makers' interest grows in the role of entrepreneurship in fueling economic growth, the role of social enterprise in creating economic and social value should be investigated (Harding, 2004). The present study attempts to examine perceptions of entrepreneurial opportunity to determine whether social opportunities differ from purely economic opportunities. That is, does the intention to become a social entrepreneur (or to pursue social entrepreneurial outcomes) differ from the intention to focus primarily on economic outcomes? The intention to enact social opportunities and engage in the production of social value is a topic that has received scant attention in the entrepreneurship literature, and one that merits examination, given societal and market needs for new venture outcomes that include closeness to the community and a capacity for flexibility and innovation (Turner & Martin, 2005). Comparing these intentions will be very useful in informing our understanding of how entrepreneurs decide to pursue specific opportunities, thereby making trade-offs and choices that will lead to particular outcomes for the venture, for the entrepreneur, and for society more broadly. Lessons from this research will guide future research in this area, as well as contribute to the design of entrepreneurship curricula that more effectively enable students driven by particular intentions and preferences, to learn about and potentially pursue social entrepreneurship opportunities.

On the other hand, it makes perfect sense to study critical entrepreneurial processes. If social entrepreneurs are indeed entrepreneurs, it is reasonable to assume that they also think like entrepreneurs. This argues for studying processes that are central to understanding entrepreneurial behaviors in general. If entrepreneurs, regardless of venue, are characterized

by opportunity-seeking, then it should be invaluable to explore opportunity recognition in any plausibly entrepreneurial domain (Dean & McMullen, 2006).

## **Background Literature**

### *Entrepreneurial Intentions*

Much has been written about entrepreneurial intentions (the stated intention for starting an entrepreneurial venture) and their origins (e.g. Davidsson, 1991; Krueger & Brazeal, 1994; Kolvereid, 1996; Douglas & Shepherd, 2000; Krueger, 2000). The dominant model of behavioral intentions was and remains Ajzen's Theory of Planned Behavior (Krueger & Carsrud, 1993; Krueger *et al.*, 2000). Interestingly, this model is homomorphic with Shapero and Sokol's model (1982) of the 'entrepreneurial event.' This parsimonious class of models is driven by well-received theory and has proven to be empirically robust, providing insight into the key antecedents of intent in general, and of entrepreneurial intentions specifically.

### *Antecedents of Intent*

In the simplest terms, entrepreneurial intentions are explained (and predicted) by two key antecedents: the perceived desirability of the action and the perceived feasibility of that action (Krueger & Brazeal, 1994; Krueger *et al.*, 2000). For each, there are both personal and social influences - one's perceived desirability of starting a business depends not just on one's own personal calculation of benefits and costs, but also the decision maker's beliefs about the supportiveness of their significant others (friends, family, co-workers, etc.) (Krueger, 2000; Shepherd & Krueger, 2002). A key antecedent of perceived feasibility is perceived self-efficacy, which can have a complex effect on intent. All other influences on intent do so indirectly. To change intent requires changing either perceived desirability, perceived feasibility, or both.

Despite the usefulness of intentions models to practice and teaching, they do not contribute a great deal about the specifics of the intended venture (Baum *et al.*, 1998). This study suggests that a proposed venture is a bundle of attributes that are intentional in nature. These attributes carry with them utilities as perceived by prospective entrepreneurs (Douglas & Shepherd, 2000). As models of planned behavior discussed above view all planned behavior as intentional, this study is predicated on the assumption that it is potentially highly useful to gain a deeper, richer understanding of these attributes and especially the trade-offs between them. Existing literature has not explored this.

### *Perception of Opportunity*

The strategy literature offers insights on how to understand the facets of strategic thinking. Dutton and Jackson used categorization theory to explore how we mentally classify a strategic issue as 'opportunity' or 'threat' (Dutton & Jackson, 1987; Jackson & Dutton, 1988). They used behavioral decision theory to argue that there are two critical antecedents that drive this categorization: (1) is the action expected to yield a net positive outcome and (2) is the action actually within our control. The overlap with the intentions models is remarkable in this

respect. If the course of action is perceived as having net positive consequences and within our control, we will see it as an opportunity; if the expected net outcome is negative and it is not within our direct control, we will perceive a threat. While these authors used additive models, one can also model perceived opportunity as the intersection of the two predictor sets.

### Opportunity Recognition

There is still some debate about whether opportunities are found (identified) or enacted (created) but it is clear that if opportunities are in the proverbial 'eye of the beholder,' then 'opportunity' is not independent of the person. As Shapero noted long ago (1982), consider the metaphor of the antenna - what our antennae are tuned toward tends to define what signals we receive and process. Shane and Venkataraman (2000) describe that the entrepreneurial activity occurs at the 'nexus' of the individual and the opportunity. If opportunities are constructed then how we process signals becomes central. Even if opportunities are simply found, then cognitive processing is still involved as our individual perceptual filters constrain what our 'antennae' notice. Given the central import of opportunities, it is not surprising there is a large, growing literature on opportunity recognition and identification. Encouragingly, this research is increasingly reliant on strong theory and moving away from mere description (Hills *et al.*, 1997).

### Deeper Cognitive Structures

While useful in many respects, intentions are insufficient to understand the deeper dynamics of how entrepreneurial vision evolves. Sarasvathy (2004) reminds us of Simon's observation that constructs such as intention represent the 'surface' layer of cognition, the 'semantic.' Below that is the 'symbolic' layer, the more abstract representation that reflects how we structure our knowledge. That is, intent and its antecedents depend on deeper knowledge structures. An expert will organize knowledge differently than a novice will (even if the content of the knowledge is identical). There is also a physiological layer underlying the symbolic layer; this represents the raw input, the raw signals, and cues we perceive. The symbolic layer handles how we filter and organize the signals (including what we notice and what we do not) in terms of deep beliefs and cognitive structures such as maps and scripts, which in turn get translated into attitudes at the semantic level (such as intentions). We have learned that the symbolic layer (e.g. maps and scripts) adds immensely to our understanding of constructs such as intent.

### Mental Prototyping of 'Opportunity'

Mental prototyping theory suggests that individuals have mental models of what a given referent 'looks like,' that is, we have mental models that provide a set of attributes or characteristics that define (to us) what constitutes an opportunity. At the surface, we know that perception of opportunity is explained and predicted by the two key antecedents identified by Dutton and Jackson; similarly, we know that intention is explained and predicted by its key antecedents. Thus, there is a profile (probably fuzzy) of characteristics that we look at and see

as an opportunity. However, mental prototyping studies often find that the profile can be complicated, as we make trade-offs between attributes; we simply cannot look at each characteristic or attribute in a vacuum.

Overall the literature suggests that we are less likely to perceive an opportunity in a situation whose key characteristics do not fit our mental prototype(s) of opportunity. As noted above, categorization theory suggests that we categorize strategic issues as 'opportunity' or 'threat' on two critical dimensions, expected gain and controllability (Dutton & Jackson, 1987; Jackson & Dutton, 1988). However, at a deeper level how we learn to assess those two dimensions depend on our mental prototypes of what would constitute an opportunity. However, one's mental prototype of 'entrepreneur' may have significant bearing on one's mental prototype of 'opportunity.' The relationships are likely to be complex, arguing for analytic techniques designed to tease out critical linkages.

### *Mental Prototyping of 'Entrepreneur'*

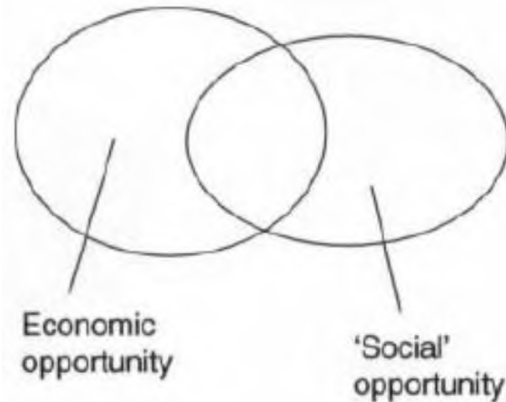
Similarly, the careers literature would tell us that we have mental models of any given career (also known as 'role identity'). The standard example is that of kindergarten teachers; our mental model of who a kindergarten teacher is and what they do usually reflects our memories of our own kindergarten teacher or our children's teacher - not very broad and possibly distorted. Anyone who teaches or trains in the entrepreneurial domain knows that people's mental models of 'entrepreneur' are highly varied.

### *Conceptual Approach*

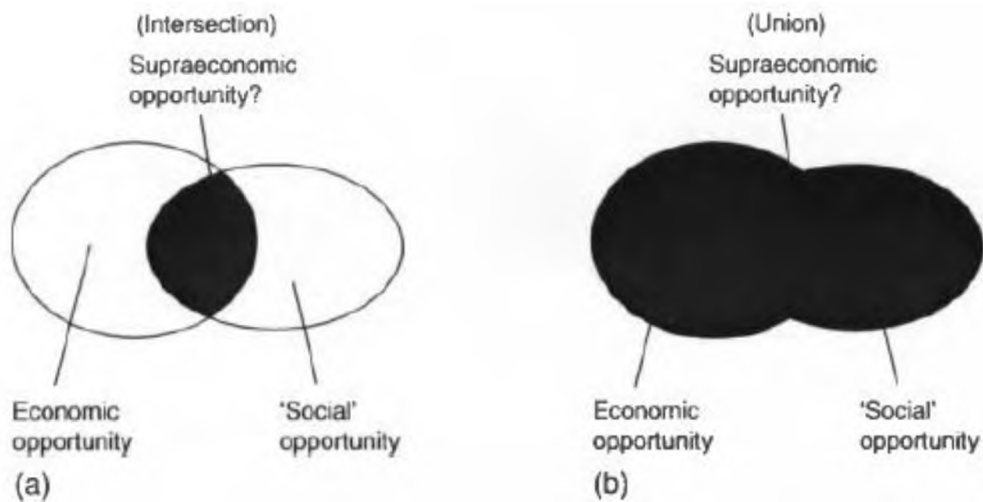
Do social entrepreneurs perceive opportunities differently? The intuitive answer here is obviously 'yes' - however, in a very real sense, we are begging the question of what is an 'opportunity.' If opportunities are perceived, even enacted, then each individual is likely to differ in her/his evoked set of 'opportunities,' that is, the full set of possibilities perceived as opportunities by a decision maker. It is not the objectively complete population of opportunities that the aspiring entrepreneur might recognize or construct, only the salient opportunities that the decision maker is aware of or, when presented, can reasonably assess as to whether they fit in the set of perceived opportunities. In the following section several relevant literatures that support this line of thinking are reviewed and summarized.

Overall, the literature suggests that individuals can reasonably limit and delimit a set of opportunities, and we can assume that 'opportunity' reflects utility, not strictly economic return (Douglas & Shepherd, 2000). This would suggest that any opportunity may be mapped as some combination of economic and non-economic utilities.<sup>1</sup> Behavioral decision theory, especially research into multi-attribute decisions, persuasively suggests that the overall evoked opportunity set can be represented as some overlapping combination of two such sets, as in Figure 5.1 (e.g. Krueger, 2003a).

However, even the deeply-explored literature on multi-attribute decision making does not provide a definitive answer to the following question: Is the set of opportunities perceived by social entrepreneurs (or, for that matter, any entrepreneur), the union of the two predictor



**Figure 5.1** Mapping supraeconomic opportunity space

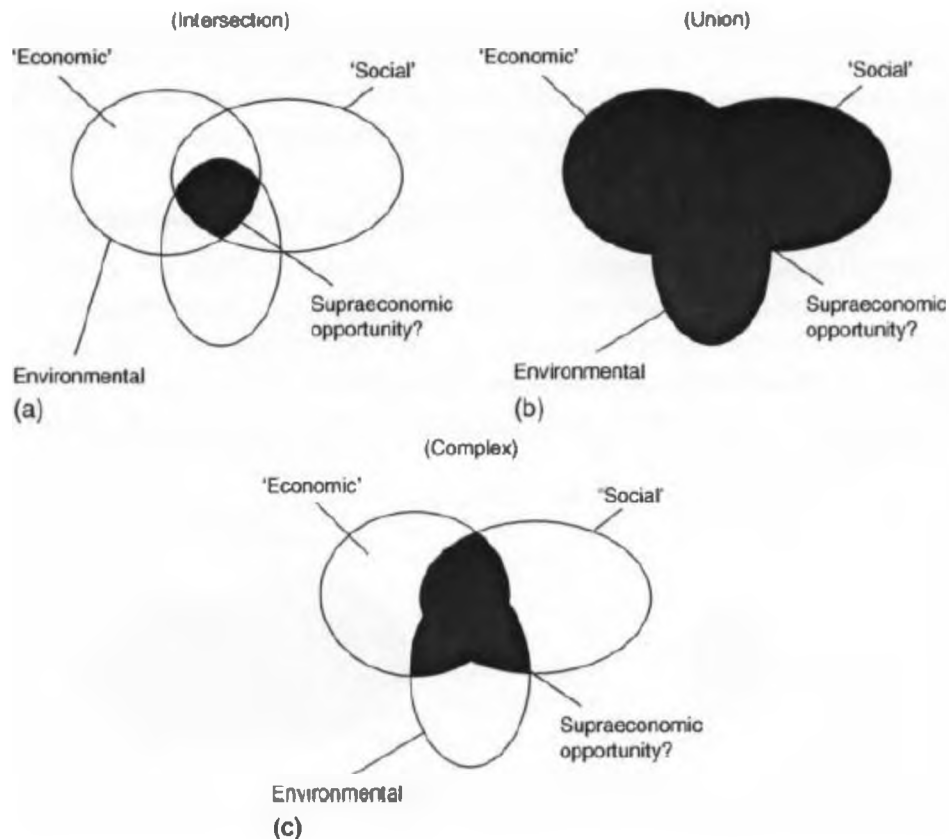


**Figure 5.2** Alternative supraeconomic opportunity space (2 domains)

sets (Figure 5.2a) or the intersection (Figure 5.2b). That is, the supraeconomic opportunity (the entrepreneur's evoked opportunity set has to satisfy either criterion (union) or both (intersection). Does it have to be seen as either a social opportunity or an economic opportunity, or can it be both?

Related to social entrepreneurship, it is also potentially important to explore the combination of all three of the 'triple bottom line' influences. Again, is it the union or the three predictor sets, the intersection or, quite possibly, a more complicated map of the social entrepreneurship opportunity space(s)? Again, does the evoked opportunity set reflect a need to meet all three criteria (intersection), any of the three (union), or might it reflect the more complex combination of an economic opportunity and either social or environmental (or both)? (see Figure 5.3).





**Figure 5.3** Alternative supraeconomic opportunity spaces (3 domains)

Overview: Entrepreneurial Opportunity Perceptions

As discussed above, mental models of what constitutes an opportunity are proposed to depend on one's mental model of entrepreneurship (Krueger & Kickul, 2005). Opportunity perceptions (and subsequent entrepreneurial intentions) are multi-attribute in nature; even the most traditional entrepreneur makes venture decisions on multiple criteria, not just on the 'numbers.' To economists, this argues that opportunity perception is neither purely economic nor purely non-economic; rather, opportunity perception is 'supraeconomic' (Krueger, 2005). However, supraeconomic opportunities may differ very subtly from purely economic opportunities, and thus most existing analytic techniques do not robustly identify the subtle differences such as what might differentiate entrepreneurs who are motivated by social value creation rather than by purely economic value creation.

Measuring Entrepreneurial Thinking

The field of cognitive science offers proven tools to better understand how potential entrepreneurs see opportunities (e.g. Baron, 2000, 2004). As discussed above, a solid stream of research has proposed and tested the key antecedents of a perceived opportunity and of entrepreneurial intentions (Davidsson, 1991; Kolvereid, 1996; Krueger, 2000; Krueger, 2003a). However, behavioral decision theory cautions that individuals utilize a mix of compensatory and non-compensatory decision making criteria, (e.g. Georgescu-Roegen, 1954) That is, sometimes

individuals make trade-offs (compensatory) and sometimes they prioritize their criteria (non-compensatory) and, most often, people use both. The dominant models of opportunity perception and intentions typically use linear additive models that assume compensatory decision making. The reality is that human decision making is often better assessed by multiplicative models, and it would be better still to use analytic methods that fully accommodate non-compensatory elements. Given that entrepreneurial decision making is multi-criteria in nature (and tends toward effectuation, not linearity), such methods become imperative (Krueger, 2003a).

### *A New Entrepreneurial Approach*

In the present study, we used discrete choice modeling (DCM) approach, which was developed in part by Professor Daniel McFadden (Winner of Nobel Prize in Economics in 2000) to map subjects' mental prototypes of 'opportunity' with subjects' mental prototypes of 'entrepreneurship' (McFadden, 1986). Discrete Choice Modeling (DCM) provides a systematic way to identify the implied relative weights and trade-offs revealed by the choices of decision makers (e.g. an entrepreneur). Naturally, DCA is not the only approach that has been used to understand and model consumer and managerial decision-making, but it has proved particularly valuable in many hundreds of applications since its introduction by McFadden (1986) and development of associated empirical experimental technique by Louviere and Woodworth (1983). Econometric models developed from a DCA study can link determinant decisionmaking attributes to decision-makers' preferences. For additional details about background and contemporary research about DCM the reader is referred to a review article by Verma and Plaschka (2005).

Our beliefs about what entrepreneurs do are a significant influence on our beliefs about what constitutes an opportunity, in particular a 'social' opportunity. Addressing this question by using DCM will contribute to the field in three important ways. First, design and use of the DCM technique will allow further in-depth examination of what constitutes an opportunity, in particular a 'social' opportunity. Second, the DCM approach will contribute to the literature in terms of understanding how individuals make choices and trade-offs that influence their own beliefs and intentions regarding ventures creation. Finally, the approach will allow the generation of unique insights into how entrepreneurs construct their evoked set of opportunities, and contribute to the understanding of entrepreneurial preferences and the potential usefulness of multiplicative models for entrepreneurship education and scholarship.

### *Mental Prototyping and 'Opportunity'*

Our evoked set of perceived opportunities is more than simple pattern recognition. Rather, mental prototyping theory argues that whether individuals see a decision situation as an 'opportunity' or not depends on our underlying mental model(s) of what comprises an opportunity. In this study, discrete choice modeling approach is used to map subjects' mental

prototypes of 'opportunity' with subjects' mental prototypes of 'entrepreneurship' with a special focus on the strategic dimensions that reflect preferences for the triple bottom line.

Similarly, as discussed above, role-identity theory argues that our career decisions are deeply influenced by our mental models about given careers. If you do not see yourself as a social entrepreneur, it suggests that you do not perceive yourself as fitting your mental prototype(s) of a social entrepreneur. If that perceived fit is absent, it is much less likely that an individual will have strong social entrepreneurial beliefs and intentions. However, one's mental prototype of 'entrepreneur' may have significant bearing on one's mental prototype of 'opportunity.' If one believes that 'entrepreneurs' are most typically engaged in rapid growth, then a situation with great potential for rapid growth is much more likely to be perceived as an opportunity. The relationships are also likely to be complex, arguing for analytic techniques designed to tease out critical linkages. Again, discrete choice modeling appears to offer a sophisticated method for mapping subjects' specific mental prototype of 'opportunity' with their mental prototyping of 'entrepreneurship' (perceived entrepreneurial role demands), moderated by other measures known to influence entrepreneurial attitudes and intentions.

The DCM approach allows researchers to provide subjects with stylized scenarios that tap into subject's preferences regarding key dimensions of a (social) venture opportunity. Using DCM, these modeled choices are then related to key underlying dimensions of subjects' mental prototypes of entrepreneurial role demands (also known as entrepreneurial role identity). Discrete choice modeling permits the mapping of the evoked opportunity sets of those inclined toward social opportunities, here modeled as preferences for triple-bottom-line ventures. This provides the first rigorous view into the opportunity space perceived, not just by social entrepreneurs, but entrepreneurs in general. Additionally, discrete choice modeling was used because it was designed to elicit not only the relative impact of a given characteristic upon the dependent variable, but because it also offers insight into the trade-offs between those characteristics (Ben-Akiva & Lerman, 1985; McFadden, 2001). For example, the technique can answer questions such as: 'If the attribute of "high tech" is favored, then is the attribute of "high growth" also favored?' 'If the attribute "high tech" is favored then is the attribute of "compete on price" disfavored?' 'While each individual has a unique decision internal calculus for a given "opportunity," it is quite likely that there are consistent differences that are driven by past experience. DCM offers a straightforward way of controlling for those exogenous influences.'

## **Methodology**

### **Sample**

Participants were 116 students enrolled in either a MBA-level entrepreneurship program located in the northeast United States, or a senior undergraduate entrepreneurial capstone class located in the western United States. The sample was balanced by gender, with an average age of 25.60. Participants average business experience was 5.90 years, with 18 per

cent having experience starting their own business. In terms of racial/ethnic background, 92 per cent of the sample were White Caucasian, 2 per cent African-American, 2 per cent Asian American, 4 per cent Hispanic and 2 per cent Pacific Islander. All participants were told that we were conducting research to better understand their attitudes and beliefs regarding entrepreneurial ventures. The survey instrument prompted participants to provide indications of their interest in starting their own business (entrepreneurial intentions) as well as their perceived skills in performing specific entrepreneurial roles and tasks. Participants were then provided with 16 stylized scenarios of entrepreneurial opportunities designed to assess their priorities on nine key dimensions. These scenarios provide the input to the DCM analysis.

### *Analytical Techniques: Discrete Choice Modeling and Multinomial Logit (MNL) Models*

As described above, Discrete Choice Modeling (DCM; McFadden, 1986, 2001) is a powerful tool that allows us to capture deeply held preferences and the associated utilities across multiple decision criteria, essentially providing the critical dimensions of the opportunity space perceived by respondents. That is, DCM surfaces the evoked opportunity sets of respondents and identifies those venture attributes which are significant. DCM has seen significant use among econometricians but has seen little use in studying entrepreneurial phenomena. Given the ability of DCM to predict, not just explain, it would seem particularly useful in understanding the genesis and evolution of venture preferences, even where relatively complicated.

Discrete choice modeling is based on macroeconomic theory that predicts individuals will act to maximize their self-interest and applies it to the most complex microeconomic choices, such as why individuals start entrepreneurial ventures. DCM links theoretical behavior (as observed in experiments, surveys and other forms of stated preferences) with behavior (as observed in real-life situations). Unlike conjoint analysis (in which the study's respondents rank or rate their preferences using experimental profiles), DCM requires that respondents make explicit choices in simulated situations derived from realistic variations of expected scenarios but here we are working to identify useful predictors. Like conjoint analysis, DCM provides a mechanism for researchers to tease out subtle trade-offs in human preferences using detailed scenarios that vary across the decision variables in question in a statistically optimal fashion.

### *Survey Instrument*

In this study respondents had to evaluate 16 different descriptions of potential entrepreneurial opportunities. For each of the 16 descriptions presented to them, respondents were asked to indicate their likelihood of starting a venture of this type. Respondents were given three choices (I would definitely start this business; I would definitely not start this business; Neither.) Below is a sample description (choice set) shown in the survey instrument. Each choice set includes a combination of each of nine dimensions. The methodology for generating the descriptions is described below (see Appendix for all 16 choice sets):

This firm is growing very fast, is competing on price, is in a cutting-edge high-tech industry, is defending existing product-markets, is funded internally (bootstrapping), is seeking strong financial performance, is not emphasizing environmental sustainability, is not emphasizing social sustainability, and is in an industry where competitive conditions are changing rapidly.

Our approach, commonly known as probabilistic Discrete Choice Modeling (DCM) has been used to model choice processes of decision makers in a variety of academic disciplines, e.g. marketing, operations management, transportation, urban planning, hospitality, and natural resource economics (e.g. Louviere & Timmermans, 1990; Verma *et al.*, 1999; Verma & Plaschka, 2005). Discrete choice experiments involve careful design of profiles and choice sets (here, involving a number of key attributes of a new venture) in which two or more alternatives are offered to participants for each choice set. The design of the experiment is under the control of the researcher, and consequently, participants' choices (dependent variable) are a function of the attributes of each alternative, personal characteristics of the respondents, and unobserved effects captured by the random component (e.g. unobserved heterogeneity or omitted factors). For a detailed theoretical and statistical background of DCM, please refer to Ben-Akiva and Lerman (1991) and McFadden (1986).

DCM applications based on choice experiments typically involve the following steps: (a) identification of attributes, (b) specification of attribute levels, (c) experimental design, (d) presentation of alternatives (choice sets) to respondents, and (e) estimation of the choice model. The first stage in the design of our DCM study involved identification of relevant opportunity attributes. As recommended by Verma *et al.* (1999), we selected attributes and levels to reflect the key attributes of a venture opportunity. Selecting opportunity attributes/dimensions prior to conducting DCM study is necessary to avoid missing potentially important attributes and also to restrict a potentially unmanageable number of experimental factors (Verma *et al.*, 1999).

A pilot study to investigate the most important strategic dimensions of new ventures based on free responses suggested that six dimensions related to the choices and decisions made by entrepreneurs in creating new ventures that are both highly salient and relatively non-overlapping: Fast growth versus low/no-growth; Competitive Strategy (price versus quality (e.g. Porter's low-cost leadership vs differentiation); High-tech versus low/no-tech; Prospector versus defender strategy (e.g. Miles and Snow's Typology); Bootstrapped versus externally funded; Choice of competitive environment (e.g. constantly changing vs. remaining stable). Although the focus of the present study is dimensions related to social entrepreneurship, including the above general strategic dimensions for new ventures serves to control for influences and preferences beyond the triple bottom line dimensions in question. It also has the potential to generate insights into the key trade-offs being made. In other words, the approach allows the mapping of the evoked opportunity sets onto the three dimensions of the triple bottom line, controlling for the other strategic dimensions.

In addition to these six dimensions, the three key dimensions of the triple bottom line of particular interest to this study were added. Each of these nine dimensions are designed to reflect respondents' attitudes related to the outcomes and advantages achieved in pursuing venture opportunities in light of the 'triple bottom line' model, including Economic sustainability (focus on creating strong financial performance); Environmental sustainability; and Social sustainability. Next, a fractional factorial design that simultaneously created both the new venture opportunity profiles, as well as the choice sets into which to place them, was employed (Verma *et al.*, 1999) resulting in the 16 choice sets used in the final survey instrument (see Appendix).

### Underlying Model

The LIMDEP program by Econometric Software Inc. ([www.limdep.com](http://www.limdep.com)) was used to estimate multinomial logit (MNL) choice models for all respondents using a maximum likelihood estimation technique. The MNL model is expressed as:

$$(P_j|C_n) = \frac{e^{V_j\mu}}{\sum_{k=1}^n e^{V_k\mu}}$$

where  $V_j$  represents the systematic component of utility ( $U_j$ ) of a choice alternative  $j$ . The model assumes that the utilities ( $U_j$ ) are comprised of a systematic component ( $V_j$ ), which can be estimated, and random error ( $\varepsilon$ ), which is independent and identically distributed according to a Gumbel distribution with a scale parameter  $\mu$ .  $(P_j|C_n)$  represents the probability of selecting an alternative, and therefore the expected market share. Representing a service as a bundle of its attributes, and by assuming an additive utility function, an alternative's systematic utility can be calculated as:

$$V_j = \sum_{a \in A} \beta_a X_{aj}$$

where  $\beta_a$  is the relative utility (part-worth utility) associated with attribute  $a$ .

As presenting the detailed statistical details of the estimated choice models in this paper would be unwieldy, the results are described here in a more user-friendly format. It should be noted that the estimated models are statistically significant, and meet all the established criteria established within the academic community. Further details are available upon request to the lead author.

### Measurement: contextual Issues

Given that it is likely that individuals of different demographic and other backgrounds differ in how they weight the different criteria as they estimate their perception of opportunity, it is important to be able to control for and analyze the sample to tease out any important differences. In particular, the literature suggests some gender differences are likely (Marlino & Wilson, 2003; Wilson *et al.*, 2004). Also, an individual with an expert entrepreneurial cognitive

script should differ from a novice (Mitchell *et al.*, 2000). An individual with high entrepreneurial self-efficacy should differ from someone with low self-efficacy. Individuals with a strong overall intent to launch a business will likely have a more coherent set of preferences and trade-offs than someone uninterested in entrepreneurship. As such, it is important to collect demographic data (e.g. age, gender, ethnicity, location), cognitive data (e.g. scripts), attitudinal data (e.g. intent) and experience data (e.g. growing up in a family business).

## Results

Before discussing the results of the different choice attributes, it is insightful to briefly discuss the descriptive results for the 16 choice sets. Choice set (#6) had the highest percentage (over 76 per cent) indicating that they would definitely start this business. This choice set was presented to respondents in the following way:

This firm is growing very fast, is competing on quality, is in a cutting-edge high-tech industry, is seeking new product-markets, is mostly funded through external capital, is seeking strong financial performance, is intentionally seeking to be environmentally sustainable, is consciously focusing on being socially sustainable, and is facing rapidly changing industry competitive conditions.

	<i>Relative utilities</i>
1. Growing very fast	<i>0.8555</i>
1. Low growth/not growing	0.1445
2. Competing on quality	<i>0.7433</i>
2. Competing on price	0.2567
3. High tech	0.4699
3. Low tech	<i>0.5301</i>
4. Seeking new product markets	<i>0.5445</i>
4. Defending existing product markets	0.4555
5. Funded through external capital	0.4831
5. Funded internally	0.4831
6. Seeking strong financial performance	0.6040
6. Not placing a high priority on financial performance	0.3960
7. Not emphasizing social responsibility	<i>0.4429</i>
7. Consciously focusing on being socially sustainable	<i>0.5571</i>
8. Intentionally seeking to be environmentally sustainable	1.0000
8. Not emphasizing environmental sustainability	0.0000
9. Competitive conditions are changing rapidly	0.4128
9. Competitive conditions are stable	<i>0.5872</i>

*Note:* Italic indicates statistical significance.

**Table 5.1** Relative utilities on each of nine dimensions (Choice of two attributes for each dimension)

Conversely, choice set (#8) had the lowest percentage (8 per cent) indicating they would definitely start this business: This choice set was presented in the following way:

This firm is not growing, is competing on price, is in a cutting-edge high-tech industry, is defending existing product-markets, is mostly funded through external capital, is not placing a high priority on financial performance, is not emphasizing environmental sustainability, is not emphasizing social sustainability, and is facing in an industry where competitive conditions are changing rapidly.

Table 5.1 shows the relative importance of the nine different dimensions, and the two different choice attributes within each of these nine dimensions for the complete model with all subjects. Participants placed the highest relative importance on the issue of environmental sustainability, with overwhelming preference for the attribute of 'intentionally seeking to be environmental sustainable' (relative utility of 1.00).

Noticeably, the second most important dimension was related to growth, with the overwhelming preference for the 'high growth' choice (Relative utility = 0.856). The strategy of the venture was third in importance. Concretely, participants preferred quality differentiation (relative utility = 0.743) over price (low-cost producer), which had a much lower relative utility. After these top three choice attributes, there was a significant decrease in the relative importance of other dimensions and attributes such as economic sustainability (defined for participants as seeking strong financial performance) (relative utility = 0.604), stable competitive conditions (relative utility = 0.587), as well as participants preferences toward social sustainability (relative utility = 0.557).

As shown in Table 5.2, significant differences were seen within the dimension of growth (t-statistic = 7.984,  $p < 0.001$ ), choice of strategy (t-statistic = 5.315,  $p < 0.001$ ), competitive environment (t-statistic = 1.927,  $p < 0.05$ ), economic sustainability (t-statistic = 2.358,  $p < 0.02$ ), and environmental sustainability (t-statistic = 10.940,  $p < 0.001$ ). Significant differences were not found on the social sustainability dimension (t-statistic = -1.253,  $p = 0.21$ ), the high-tech/low-tech dimension (t-statistic = -0.689,  $p = 0.49$ ), the bootstrap versus external funding dimension (t-statistic = -0.3830,  $p = 0.70$ ), nor the prospector versus defender dimension (t-statistic = 0.985,  $p = 0.32$ ).

## Discussion

As the results show, participants showed a remarkable preference for starting ventures that include environmental sustainability, suggesting a high degree of perceived desirability for such ventures. However, these findings also raise three additional questions that cannot be answered in the current study. First, is this perceived desirability of environmental sustainability also accompanied by a strong belief that environmental sustainability is feasible? It is possible that the nature of the methodology, specifically the way the scenarios are presented, bias subjects toward assuming feasibility. Second, how much of this result derives from the growing popularity of 'green' business that business students are exposed to through



<i>Variable</i>	<i>Beta weight</i>	<i>Std error</i>	<i>t-statistic</i>	<i>P-value</i>	<i>Main effects</i>	<i>Relative main effects</i>
Intercept	-0.8057	0.0694	-11.6120	0.0000		
1. <i>Growth versus non-growth</i> (1 = growing very fast, -1 = not growing)	0.5355	0.0671	7.9840	0.0000	1.0711	0.7111
2. <i>Competing on price versus competing on quality</i> (1 = quality, -1 = price)	0.3665	0.0690	5.3150	0.0000	0.7329	0.4866
3. <i>High-tech versus low/no-tech</i> (1 = cutting-edge high tech industry, -1 = low/no-tech industry)	-0.0454	0.0659	-0.6890	0.4911	-0.0908	-0.0603
4. <i>Prospector versus defender strategy</i> (1 = seeking new product-markets, -1 = defending existing product-markets)	0.0670	0.0680	0.9850	0.3246	0.1339	0.0889
5. <i>Bootstrapped versus externally funded</i> (1 = funded through external capital, -1 = funded internally bootstrapping)	-0.0255	0.0667	-0.3830	0.7020	-0.0511	-0.0339
6. <i>Economic sustainability</i> (1 = seeking strong financial performance, -1 = not placing a high priority on financial performance)	0.1567	0.0665	2.3580	0.0184	0.3134	0.2081
7. <i>Social sustainability</i> (1 = not emphasizing social sustainability, -1 = is consciously focusing on being socially sustainable)	-0.0860	0.0686	-1.2530	0.2101	-0.1720	-0.1142
8. <i>Environmental sustainability</i> (1 = intentionally seeking to be environmentally sustainable, -1 = not emphasizing environmental sustainability)	0.7531	0.0688	10.9400	0.0000	1.5062	1.0000
9. <i>Competitive environment</i> (1 = competitive conditions are changing rapidly, -1 = in an industry where competitive conditions are stable)	-0.1314	0.0682	-1.9270	0.0439	-0.2628	-0.1745

Note: *Italic* indicates statistical significance.

**Table 5.2** Preference measures of the nine dimensions

the popular press and in the classroom? Third, if environmental sustainability is important in their decision making, why the low preferences for the arguably broader attribute of 'social' sustainability?

Interestingly, subjects also expressed a strong preference for starting a fast-growing venture. Paradoxically, rapid growth is often seen by many to be inconsistent, or to potentially compromise, environmental sustainability, yet participants display a strong preference for both fast growth and environmental concern. Given that entrepreneurship students and trainees hear a constant 'drumbeat' about the value of rapid growth (that's what VCs prefer, etc.) we can assume that the importance of growth must be quite salient in subjects' minds. Also, it seems clear that subjects think more in terms of growth overall rather than purely economic performance. (Relative utility of growing very fast = 0.8555, versus relative utility of seeking strong financial performance = 0.6040). However, given the growing interest in large impact/high potential social ventures (e.g. the Skoll Foundation and Ashoka2), this joint preference merits further analysis. The other most highly prioritized attributes appear relatively understandable. The preference for competing on quality, rather than price, certainly appears consistent with seeking environmental sustainability. The subjects also reported a preference for a reasonably stable competitive space, not surprising among relatively less-experienced entrepreneurs. The non-significance of other dimensions, such as high-tech versus low-tech, appear surprising. Given how prominently cutting edge technology (and its association with high growth strategies) is featured in many entrepreneurship courses, this non-result suggests that students might not be simply operating under the heuristic that being 'green' and 'high-growth' is highly desirable, but 'high-tech' need not be.

Overall, we see that these subjects seem to exhibit a perhaps surprising evoked set of opportunities, especially with their strong preferences for simultaneously focusing on environmental sustainability and rapid growth. It is interesting that although economic sustainability (defined as strong financial performance or not) was significant, it was less important in their priorities. As discussed above, it is also interesting that social sustainability does not appear to be a major factor. These results seem to provide evidence that subjects' opportunity space is not simply constructed, but rather reflect a mix of compensatory and non-compensatory decision criteria. As nearly all subjects strongly preferred environmental sustainability, it is reasonable to assume that this dimension is a 'must have,' and that no other variables can reasonably compensate for its absence, i.e. no trade-offs. However, it is quite likely that the other dimensions will reflect trade-offs, as the lower relative utilities suggest that with the presence of a strategic intent toward environmental sustainability assured, other combinations of strategic dimensions are acceptable. In Venn diagram terms (see Figure 5.3), the evoked opportunity set likely includes most of the set of environmental opportunities, but little of the 'social' set, and perhaps we should include from the set of 'economic' opportunities only those with higher growth potential? That is, for these subjects, the Venn diagram might be better conceived - not as the triple bottom line dimensions, but as overlapping sets reflecting environmental sustainability, high growth and competing on quality.

One possible conclusion is that the triple bottom line concept itself is not particularly salient in the minds of these subjects, and although specific environmental issues may be important, broader social issues are not so vital. Another is that the operationalization of

'socially sustainable' may be flawed, given it is inherently a fuzzier definition than the other two. Yet another possible conclusion is that, to the subjects, 'environmental' subsumes much of 'social', thus 'social' was redundant to the decision. Future research can readily test these competing conclusions.

### Implications

There are a number of implications that are related to this research and these findings. Overall, understanding the opportunity recognition process is critical to advancing entrepreneurial thinking and action, but it becomes particularly useful as entrepreneurship extends to broader, richer domains such as sustainable ventures (Dean & McMullen, 2006). A fuller understanding of the complex nature of underlying opportunity perceptions for entrepreneurship will allow the development of curriculum, programs and tools that better reflect individuals' intrinsic needs and values. A failure to promote entrepreneurship in a way that fully reflects these underlying perceptions may result in a reduced pipeline of enthusiastic and talented individuals who care about building economically healthy businesses that simultaneously incorporate social value creation, especially environmentally friendly practices. Understanding the intrinsic motives of individual aspiring entrepreneurs also has implications for the way society views and rewards entrepreneurs. If entrepreneurs who focus on both economic and social value creation are not explicitly encouraged, and valued for their work and efforts, they may, over a period of time, alter their motivational biases or chose alternate career paths.

Failure to recognize the full range of perceived opportunities for entrepreneurship may also lead to important deficiencies in the way we measure success. The most common metrics used in the entrepreneur-ship literature for success are economically-driven such as growth in sales or profits. This uni-dimensional focus, which implicitly excludes any other type of value creation, may have important follow-on effects in terms of how resources are allocated. This may be especially important in terms of access to capital, and those who seek funds to build organizations that have elements of social value creation, especially environmental, in their missions, may not be recognized because on paper, using the standard measures of performance, they appear less 'successful.' Anna *et al.* (1999) also provided evidence to suggest that entrepreneurial self-efficacy plays a role in determining ultimate size of the entrepreneurial venture. In addition to these reasons, a future research direction could investigate whether entrepreneurs choose to build 'smaller' business in economic terms, because they have a dual goal to build 'richer' businesses in social terms (but might still seek rapid growth initially).

Also, if as the results suggest the general concept of social sustainability is less important to aspiring entrepreneurs (though the other two dimensions of the triple bottom line are), we need to ensure that we clearly explore this dimension in our classroom discussions of the triple bottom line, e.g. to include exercises to explore potential entrepreneurial opportunities according to different facets of social sustainability. Social entrepreneurship

champions Ashoka and especially Skoll (fn 4) provide tools for engaging students in such discussion. Finally, the complexity of these findings offers ample grist for classroom discussion. For example, this offers us a new vehicle for exploring how guest entrepreneurs learned to see the opportunities they do (and those they don't). The Discrete Choice Modeling approach used in this study also provides educators a tool to capture students' preferences in a way that is less obtrusive and less likely to be contaminated by social desirability or the expectations of others. It can also give us insights into their entrepreneurial passions.

### **Future Research Directions**

In addition to the data presented in this paper, we have gathered considerable information that will permit us in the future to explore potential antecedents of venture preferences and to create profile analyses (e.g. gender effects). We also anticipate that the qualitative data will explain and enrich our findings, further demonstrating the strength and direction of the relationships between subjects' mental prototypes of 'social entrepreneur' and of 'social opportunity.' While the relationships are also likely to be complex, our design and methodology will allow us to tease out critical linkages. This information can then be applied to design strategies and educational programs tailored to how individuals make choices, trade-offs, and weight their attitudes and intentions regarding social ventures.

The ability to generalize these findings needs to be addressed. In particular, we need to investigate whether the non-salience of 'social sustainability' is a matter of being subsumed by 'environmental' sustainability, being poorly worded, or whether it is truly not salient to subjects. We also need to test whether the criteria of economic sustainability (strong financial performance) and high-growth are complements or substitutes. (In other words, do we need both or just one?)

As discussed above, the strong emphasis on one attribute (environmental sustainability) appears to be evidence for a non-compensatory decision criterion. Replication of this finding might suggest evidence for lexicographic ordering of decision criteria. That is, given a most-favored decision criterion, if only one potential entrepreneurial opportunity (choice set) presented fits that criterion then the decision is made. If no criteria fit, or if many fit, then we proceed to the second most important criterion, and so forth. There is some evidence that human voting behavior fits this model incompletely (e.g. Georgescu-Roegen, 1954). Given that subjects are grounding their choices in personal experience, and thus incomplete information, this need not be optimal (e.g. Hamilton & Hitz, 1996). However, it would be striking to find additional evidence that entrepreneurs enact opportunities in lexicographic fashion, as that would require some rethinking of the functional form of our empirical models. That is, we may need to focus on multiplicative models, plus other methodologies that better capture lexicographic preferences.

Another way to look at these findings is that a non-compensatory decision criterion may reflect the respondent's passion (or, more accurately, the *sine qua non* object of

entrepreneurial passion). We have a strong sense that entrepreneurs are driven by passion, but we have little understanding of the specifics. We tend to think of entrepreneurs as passionate about being entrepreneurs, but these findings suggest that at least a significant number of entrepreneurs may have a passion for a specific facet of the venture.

It appears imperative therefore for researchers (and educators) to elicit these 'must-have' criteria for prospective new ventures; even a list of what our subjects consider to be the 'deal breakers' would be quite enlightening, especially in comparison to their role-identity (mental prototype of 'entrepreneur') and the barriers they perceive. For example, such information would be fruitful ground for interviewing entrepreneurs, both current and potential. Finally, these findings make it even more imperative to apply this research to broader samples. It would also be useful to test this approach longitudinally. If aspiring entrepreneurs' preferences for new ventures are complex, it would be fascinating to track those preferences over time, e.g. while a student is advancing through an entrepreneurship program (perhaps compare the evolution of his preferences depending on whether he is focusing study on social ventures or on a more conventional track) and later as they launch his venture(s). It might be useful to track changes in preferences of clients of incubators where we could compare changing preferences against stages of firm development. For example, do social considerations increase, or get lost in the pressures to launch and grow? As such, this model gives us a powerful tool to test the degree to which entrepreneurs use effectuation (Sarasvathy, 2004) rather than linear decision making.

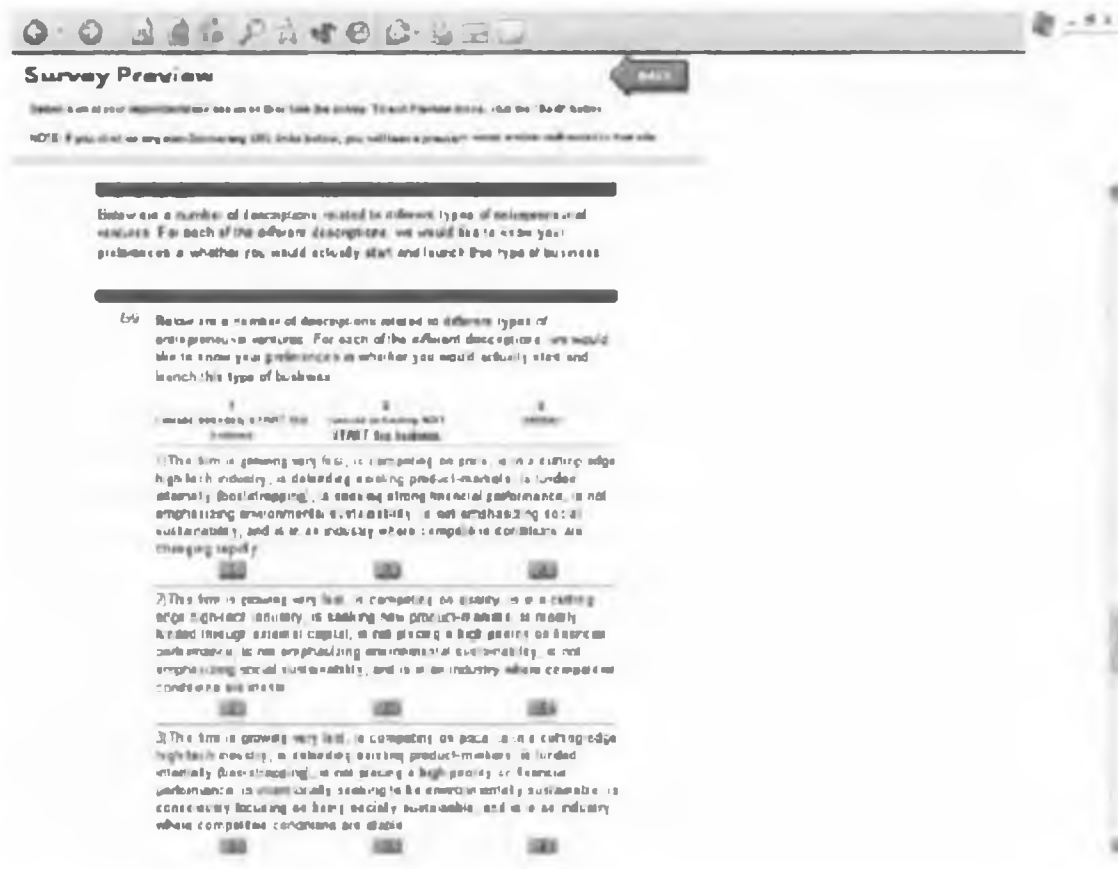
## **Conclusions**

Arguably, it has always been important to get a better understanding of just how entrepreneurs see and enact their personal opportunities because the 'heart' of entrepreneurship starts with the opportunities that aspiring entrepreneurs perceive. This study has cracked open a door to a new approach to understanding how social entrepreneurs (and any entrepreneur for that matter) construct their opportunity space. The idea of creating positive social outcomes, as well as financial ones, is rooted within the social entrepreneurship literature and has more recently received attention among academic and clinical entrepreneurship researchers. Social entrepreneurship represents the multiple benefits and rewards that accrue to those entrepreneurs with a heightened sense of accountability to the constituencies served, as well as the outcomes that are created. Social entrepreneurs seek to provide social improvements and enhancements to their communities and/or the world more generally, including attractive (both social and financial) return to a broad range of stakeholders. Social entrepreneurs assess their impact and influence in terms of the social outcomes, not simply in the standard economic terms of size, growth, or processes. Discrete Choice Modeling has permitted us to begin identifying the evoked opportunity sets for aspiring entrepreneurs. Our results suggest that our students and trainees already have rich and complex mental models about potential personal ventures, and specifically models that encompass certain social value creation aspirations such as environmental sustainability, as well as financial ones. This is a

critical starting point for understanding the diverse perceived opportunities and beliefs of our future aspiring entrepreneurs, so that we may appropriately empower them to act as the change agents for themselves, their communities, and the world, allowing them to invent new, profitable, and sustainable approaches that create solutions to change society for the better.

## Appendix

### Example of DCM choice sets



### Notes

1. Technically, *supraeconomic* opportunity (e.g. see Krueger, 2005).
2. [www.ashoka.org](http://www.ashoka.org), [www.changemakers.net](http://www.changemakers.net); [www.skollfoundation.org](http://www.skollfoundation.org).

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