

# **Sustainable Minded Entrepreneurs: Developing and Testing a Values-Based Framework**

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*In this multi-method work I begin to explore the core values that drive sustainable minded entrepreneurs. Findings from qualitative research with 29 entrepreneurs and a review of the management literature indicate several values that sustainable entrepreneurs may commonly possess. The emergent sustainable values of continuous improvement, frugality, holistic cognition and morality are then empirically evaluated using a sample of 305 students. Further I examine the relationships of these values with three proposed correlates of sustainable attachment. The findings indicate the relatedness of these values to each other and three modes of sustainable attachment except for the value of continuous improvement.*

## **INTRODUCTION**

Entrepreneurship has been shown to change our world and enact numerous positive outcomes. Today perhaps more than ever, entrepreneurship is seen as a potent means to transform society and bring about desired economic and social good. The wealth created by entrepreneurs has improved humanity's plight and initiated significant social change. In many instances the results are decades after the entrepreneur has made it through the trials of a start-up and created an enterprise of considerable worth. The stories of these entrepreneurs captivate us since they are extraordinary and are indeed rare. Rather than examine these entrepreneurs who employ their wealth after the rarity of success, I seek to better understand a class of entrepreneurs who decide to contribute to society and help to protect the environment while they are in the process of establishing their for profit ventures. A significant number of entrepreneurs have utilized their businesses to enact sustainable initiatives that minimize environmental impact, provide meaningful work for people, contribute to the betterment of society and/or to support local communities (Choi and Gray, 2008; Parrish, 2010). These individuals can be classified as sustainable minded entrepreneurs since they seek to enact the tenets of sustainability in their ventures. In this work sustainability is defined as accounting for the needs of humanity for today and future generations while maintaining the integrity of the World's ecosystem (Brundtland, 1987). A key challenge for sustainability is to put its tenets into practice and entrepreneurship is a mechanism to help address sustainability challenges.

The body of research on sustainable entrepreneurship is growing, which is understandable given the challenges we now face. Shepard and Patzelt (2011) define sustainable entrepreneurship as being focused on the preservation of nature, life support, and community in the pursuit of perceived opportunities to bring into existence future products, processes, and services for gain, where gain is broadly construed to include economic and non-economic gains to individuals, the economy, and society. Moreover, several scholars see entrepreneurship as a means to advance sustainable initiatives (Cohen, Smith, Mitchell, 2008; Schlange, 2006). A few have examined individual beliefs in the sustainable arena (Choi and Gray, 2008;

Gagnon and Michael, 2011; Kuckertz and Wagner, 2010; Shepherd, Kuskova and Patzelt, 2009) and others have highlighted sustainability's role in the opportunity space (Cohen and Winn, 2007; Dean and McMullen, 2007).

This work is guided by three research questions: 1) How can we better understand and describe sustainable minded entrepreneurs? 2) What core values drive entrepreneurs who are focused on sustainability? And 3) how do we identify nascent sustainably minded entrepreneurs? I will first begin by integrating a review of the organizational science literature in the context of a qualitative study of 29 entrepreneurs that have professed incorporating sustainability in their businesses. After defining a framework that has emerged from this inquiry, I will then test a series of hypotheses using empirical data obtained from a sample of 305 potential entrepreneurs.

## **MINDSET OF THE SUSTAINABLE ENTREPRENEUR**

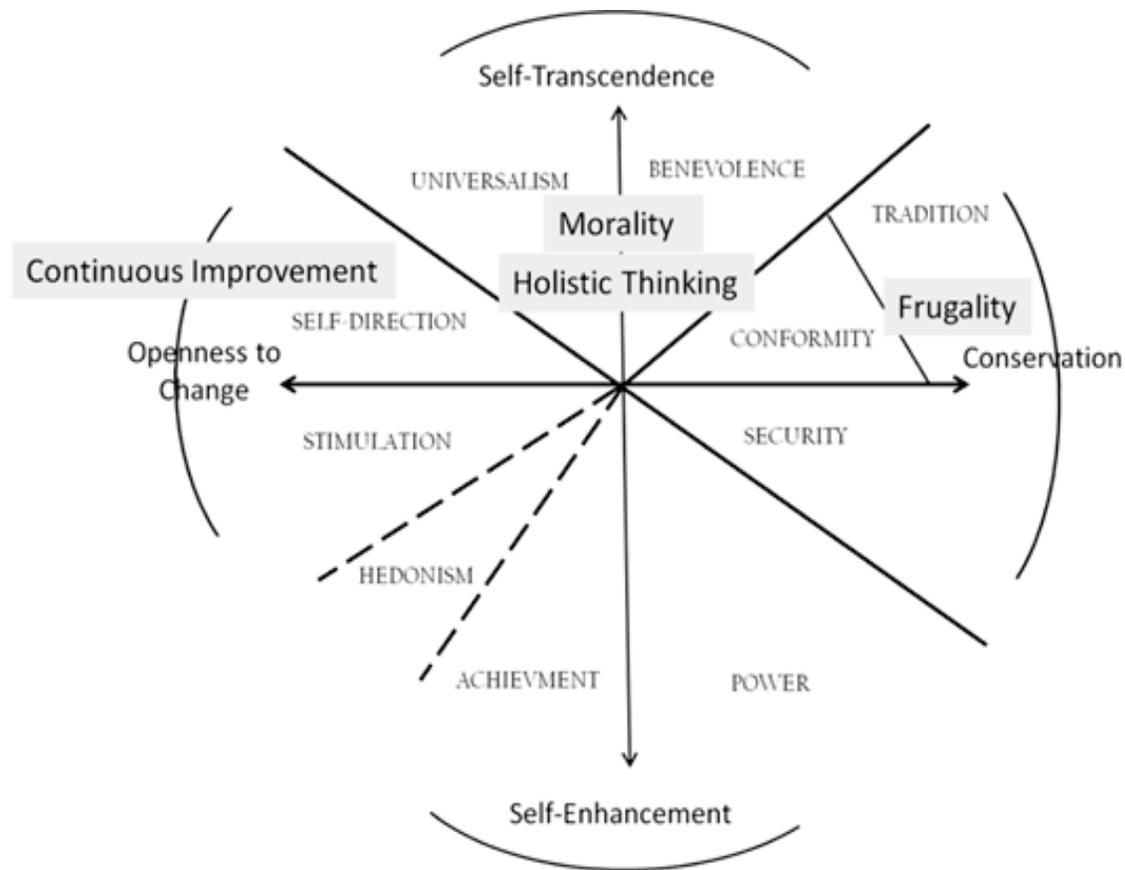
The concept of mindset guides individual interpretation of information and helps guide subsequent actions. On the cognitive level, schema theory best describes the concept of mindset. Schemas are knowledge structures that individuals create to organize and interpret new information that they encounter (Fiske and Taylor, 1991; Lord and Foti, 1986; Neisser, 1976). For example professors in the physical sciences will possess knowledge structures that contain fundamentals in math, physics and chemistry and these basic structures will guide their scientific inquiry. Affect also plays a role in mindsets, since individuals require a necessary motivational component for the way they see and where they look, which cannot be captured by pure cognitive frameworks alone. For example the affective attributes of "entrepreneurial passion" is well documented in the literature (Baron, 2008; Cardon, Wincent, Singh and Drnovsek, 2009; Chen, Yao and Kotha, 2009; Lock and Baum, 2007). Overall, there are certain representative knowledge and affect structures that are likely to exist for a particular mindset. Mindsets can be seen to encompass certain themes such as entrepreneurial (Haynie, Shepherd, Mosakowski and Earley, 2009; Hitt, Ireland, Sirmon and Trahms, 2011; McGrath and Macmillan, 2000; Shepherd, Douglas and Fitzsimmons, 2008), growth focused (Dweck, 2006) and continuous improvement focused (Ohno, 1988; Womack and Jones, 1996). I argue that there exists a mindset for the sustainable focused entrepreneur; that there are certain common values and ways of seeing that these sustainable focused entrepreneurs possess.

The study of individual values has a long tradition in psychology (Hofstede and Hofstede, 2005; Rokeach, 1973; Schwartz, 1992) and has been applied to better understand sustainable development (Shepherd et al., 2009), executive psychology and its linkages to firm outcomes (Finkelstein and Hambrick, 1996; Lichenstein and Dade, 2007). I use the definition of values provided by Schwartz (1992) which describes values as (1) being concepts or beliefs, that (2) pertain to desirable end states or behaviors, (3) transcend specific situations, (4) guide selection or evaluation of behavior and events and (5) are ordered by relative importance. Moreover considerable work has been undertaken to define the dominant value content and structure of individuals. Schwartz's (1992) two dimensional values structure listed in Figure-1 provides a helpful framework for our investigation into values held by sustainable minded entrepreneurs. The framework highlights two values directing continuum along with a major values classification system. The two direction continua have to do with change and self-interest with the major value categories fitting along a dimensional space around these continua. From a review of the literature on sustainability it can be argued that the major value categories of sustainability are likely to fall on the self-transcendence end of the self-interest spectrum highlighting the major values categories of universalism and benevolence. I would argue that sustainability values would occupy both ends of the change spectrum since in many instances conservation values are emphasized and in others change is encouraged especially in regards to confronting overly consumptive patterns.

Many entrepreneurs seek to infuse their values into their enterprises which taken in a set help form the organizational identity and culture (Cardon, et al, 2009; Choi and Gray, 2008; Dess and Starr, 1992; Morris, Schindehutte, Walton and Allen, 2002; Schein, 2010; Sirsly, 2009). A significant number of entrepreneurs have utilized their businesses to enact sustainable initiatives that minimize environmental

impact, provide meaningful work for people, and contribute to the betterment of society and/or to support local communities (Choi and Gray, 2008; Parrish, 2010). One doesn't have to search too long to see examples of both positive (Chappell, 1999; Chouinard, 2005) and negative (Kets De Vries, 1993; McLean and Elkind, 2003) societal impacts of founder values in venturing. In the next section a set of sustainable values is obtained from interviews with entrepreneurs who have reported to engage in sustainable venturing practices.

**FIGURE 1**  
**SCHWARTZ'S TWO DIMENSIONAL VALUE STRUCTURE**



**STUDY ONE: QUALITATIVE RESEARCH ON SUSTAINABLE ENTREPRENEUR VALUES**

Interviews were conducted with 29 entrepreneurs in the agriculture and natural resource fields who expressed incorporating sustainability into their businesses. Table 1 provides additional information on the interview participants who founded new companies that were less than 7 years old. The business types ranged from food processing to green building. Qualitative research methods (e.g., Glaser and Strauss, 1967; Strauss and Corbin; 1998) were used to interview these key informants in the agriculture and natural resources (A&NR) sectors to investigate entrepreneurial phenomenon. The researcher selected these fields since they dealt with natural renewable resources which represent a sound context to investigate sustainability. This interview research relies on theoretical sampling (Glaser and Strauss, 1967). The interviewees were selected because it was thought they would provide crystallizing information on entrepreneurs' driving set of values behind sustainability. We used the following open ended questions: *What personally held values do you wish to instill in your company? Does your*

company promote sustainability? If yes, Can you provide examples? And, Can you describe a time or times in your life that triggered your interest in sustainability? Additional methodological details are available from the author.

**TABLE 1**  
**QUALITATIVE SAMPLE CHARACTERISTICS**

<b>Business Type</b>	<b>n</b>	<b>Percentage</b>
Farming/Animal Science	9	31
Horticulture	3	10
Brewing	2	7
Green Building	3	10
Wood products	2	7
Food Processing/Baking	10	34
Total	29	

After coding entrepreneur responses using NVivo 8.0, the most frequently mentioned codes and textual data were examined in detail using the literature in organizational science as a backdrop. The four values of *continuous improvement*, *frugality*, *holistic cognition* and *morality* were prominent in entrepreneurs' responses and stories about sustainability. Additional methodological information is available from the author. Each of these values will be discussed in detail below drawing from the organizational science literature and will be illustrated by entrepreneur quotes.

**Continuous Improvement**

Many sustainable focused entrepreneurs express that addressing the challenges of sustainability requires a commitment to continuous improvement. Continuous improvement involves a proactive focus on problem solving and efficiency optimization. For example many continuous improvement efforts involve preventing problems or waste from occurring before activities begin versus just working to mitigate problems or reduce waste after a process has been undertaken. In addition, the process versus ends focus is essential for continuous improvement since standards of waste reduction and efficiency improvements continue to be raised. Continuous improvement is indeed a goal directed behavior to a series of ever challenging goals which push and pull individuals and enterprises forward to accomplishment (Larson, 2003; Ohno, 1988; Womack and Jones, 1996). Further considerable benchmarking occurs with continuous improvement that results in continually establishing new standards of excellence. Moreover, individuals who value and are active in continuous improvement engage in a significant amount of meta-cognition. The meta cognitive aspects of challenging dominant paradigms are commonly employed in continuous improvement initiatives and have been examined in entrepreneurship (Haynie et al 2009; Mitchell, Smith, Gustafsson, Davidsson, and Mitchell, 2006).

Several researchers and advocates in the field of sustainability argue a stepwise approach versus attempting to tackle all challenges in one effort express that it remains a challenge not to become overwhelmed with the barriers to sustainability and give up hope (Hawkin, 1994; McKibben, 2010). Sustainable minded entrepreneurs saw the need to take action and continue to strive to do better with their sustainable efforts. Process oriented, longer view cognitions help frame the outlook for many entrepreneurs who seek to advance sustainability. Interestingly, these improvement efforts that addressed the tenets of sustainability also addressed subjects that are germane to economic enterprise and often demonstrated positive economic returns (Savitz and Weber, 2006; Werbach, 2009). Consider the

following quotes from entrepreneurs that sought continuous improvement as part of their sustainable efforts in venturing.

“The perennial agriculture on our farms, which is good, the land here was mole plowed for a lot of years and I think because of that we had, even for [our] county, some extremely low organic content even under 1% in some cases, and in this area we should be able to get up to around 3.5, 4 % and I’m striving for 5.”

“There is room for improvement there and I’ve been taking that in stages and I think it just makes sense in so many ways. I’m always looking for ways I can run things different when it comes to a greener business.”

“... That has our waste up 12 cubic yards, we cut it in half... I’m looking at getting down to 6 cubic yards of garbage. We go through pretty high volumes so for a restaurant that would be ideal, that’s my goal...”

Therefore the following hypothesis is proposed.

*H1: Continuous improvement is a core value of the sustainable mindset which will be positively related to frugality, holistic cognition and morality.*

### **Frugality**

Preserving one’s resources unless use of it is absolutely necessary seems to be at the forefront of many sustainable focused entrepreneur activities. Frugality is defined as enduring short-term sacrifices and avoiding resource depletion to achieve a longer term goal (DeYoung, 1996; Lastovicka, Bettencourt, Hughner and Kuntze, 1999). The literature offers several accounts from leading entrepreneurs in sustainability referrer to using the bare minimum and using resources for only what is essential. These stories highlighted a common theme in general entrepreneurship called bootstrapping (i.e., doing the best you can spending as little cash as possible (Bhide, 1992; Cornwall, 2010; Windborg and Landstrom, 2000) yet they go beyond. Entrepreneurs that enable sustainability see frugality as not just a means to preserve cash to make it out of the start-up deficit, but as a permanent way of operating. Sustainable minded entrepreneurs saw value in reusing, repurposing materials, delaying purchases to buy quality items and held a larger more encompassing view of the true cost of items. The sustainable entrepreneur model of cost typically accounted for a wider perspective that included disposal and costs that were considered by past business to be externalities. Moreover a preference toward second hand items and fierce negotiation is an essential component of the frugal means employed by sustainable entrepreneurs.

Several sustainable minded entrepreneurs highlight frugality in their venturing. For example, Chouinard (2005) the founder of Patagonia discusses in their company’s biography how they kept a minimalist perspective as they grew. Likewise Chappell’s (1999) account of growing Tom’s of Maine had similar themes of when they made due with the bare essentials and avoided spending in order to pursue an enduring goal. In addition, several researchers (Lastovicka, Bettencourt, Hughner and Kuntze, 1999; Pepper, Jackson and Uzzell 2009) indicate that frugal individuals are less swayed by the influences of others and show potential linkages with the movement away from modern day materialism. Building on the theme of sustainable consumption, Pepper, Jackson and Uzzell (2009) highlight the underlying values that drive the socially conscious frugal centric behaviors of people. The themes of frugality match well with the accounts of the sustainable focused entrepreneurs I interviewed. The following quotes from entrepreneurs engaged in sustainability highlight an adherence to frugal principals.

“The other thing that I could recommend to them, is don’t borrow money unless it’s for real estate. We have never borrowed any money for anything but real estate, and I have lived that way all of my life, and my personal life as well, and I recommend that for everyone. Do not borrow money for equipment; do not borrow money for cars and trucks,

if you don't have the cash to buy it you don't buy it. One last thing for anyone in the world that wants any advice from me spend less than you make."

"The kitchen that we're in now is not my dream work environment and it never was and I don't even have an office I walk back and forth through the production space with my laptop and my little plug like 8 times a day. I knew that if I could just deal with this, and we have adapted the space, that down the line I would be able to move into a space that I really enjoyed."

Therefore:

*H2: Frugality is a core value of the sustainable mindset which will be positively related to continuous improvement, holistic cognition and morality.*

### **Holistic Cognition**

Sustainable minded entrepreneurs valued holistic cognition as a dominant mode of thinking which is also evident in the literature on sustainability and entrepreneurship. Sustainable focused entrepreneurs tend to think in relational format and about distal cause and effect patterns. These entrepreneurs consider the implications of their decisions beyond their enterprise boundaries and immediate tasks at hand. Moreover, sustainable minded entrepreneurs valued the following key aspects of holistic cognition highlighted in the literature such as seeing relatedness versus categories, placing greater weight on context, having comfort with contradiction, reliance on change and not being quick to assign cause to objects alone (Choi, Koo and Choi, 2007; Monga and John, 2008; Nisbett, Peng, Choi and Norenzayan, 2001). Further, sustainable minded entrepreneurs highlighted their consideration of others as a key factor in their decision making and in many instances considered others not directly involved with the decision such as society and community. It was clear in the stories of these sustainable minded entrepreneurs that they examined their enterprises, decisions and actions as part of a deeply connected social and environmental context. The following quotes highlight sustainable minded entrepreneurs' value of holistic thinking.

"That's the interesting thing about what we do here, most of it's based upon relationships, it's not a lot of heavy technology, it's relationships with other individuals in the community, finding a place in the community to get some benefit out of reuse of some kind of waste product here."

"I try to be environmentally minded. I think it just makes sense for your wallet, anytime that you can reuse or eliminate waste or do those things it makes economical sense. It goes beyond the environmental benefit to a financial benefit. My husband is definitely into that and we are locally minded people, we try to shop local, local vendors."

Therefore:

*H3: Holistic cognition is a core value of the sustainable mindset which will be positively related to continuous improvement, frugality and morality.*

### **Morality**

Sustainable focused entrepreneurs answer the call to causes that go beyond self-interest maximization. Sustainability at its core considers the needs of many stakeholders (Brundtland 1987; Elkington, 1998; Hawken, 1994; Hawken, Lovins and Lovins, 1999; Parris and Kates, 2003; Werbach, 2009) and the theme of a higher degree of morals/ethics were held by the sustainable focused entrepreneurs that were interviewed. I define morals as an individual's code of values that frame right versus wrong courses of action with respect to dealing with others. In the field of entrepreneurship, morality is typically manifest in decision-based contexts. Similar to other scholars, I also equate morals with ethics (Bryant, 2009;

Jones and Ryan, 1997; Trevino, 1986). Several scholars argue that entrepreneurs have a series of unique ethical challenges (Bryant, 2009; Hannafey, 2003; Morris, Schindehutte, Walton and Allen, 2002) and some assert that entrepreneurs possess a higher level of moral reasoning ability versus managers and the general population (Teal and Carroll, 1999). I would argue that entrepreneurs who incorporate sustainability into their ventures are likely to demonstrate a high ability for moral reasoning. Kohlberg (1969) proposed that individuals progress through three major levels of moral development (pre-conventional, conventional and principled) in an upward progression. I would argue along with others (Teal and Carroll, 1999) that sustainable focused entrepreneurs are more likely to be at Kohlberg's principled (highest level) of moral development. The following quotes highlight sustainable entrepreneurs' higher moral development.

“I think a lot of my Christian values have really made me to be a fair business.”  
[Entrepreneur speaking about a past corporate role] “ I really didn't enjoy the business atmosphere it was a little too cut throat a little to dog eat dog from what I was interested. I felt like some of my principles had to be sacrificed to succeed there. To me it was not conducive to developing a whole lot of business ethics and morals.”  
“That is one of the things that I haven't really used it as a marketing point, but I've been using it as a moral point, and I was just discussing this with a friend that putting that in the packaging that we use is very simplistic for a reason; because you're not paying for the package you're paying for the product.

Therefore:

*H4: Morality is a core value of the sustainable mindset which will be positively related to continuous improvement, frugality and holistic cognition.*

### **Mindset Values and Attachment to Sustainability**

Each of these values is expected to demonstrate linkages with individual attachment to sustainability as discussed in the sections above. Individual attachment to sustainability is composed of one's affective and cognitive connections with the concept of sustainability. In simple form it is the degree and depth of individual “buy-in” to the tenets of sustainability that require self interest seeking to be balanced with consideration of others' interests across such dimensions of resources, time, geography and social ideology. Moreover, individual attachment to sustainability has been explored by entrepreneurship scholars and demonstrates potential for improving our understanding of sustainable focused venturing (Choi and Gray, 2008; Gagnon and Michael, 2011; Parrish, 2010; Kuckertz and Wager, 2010).

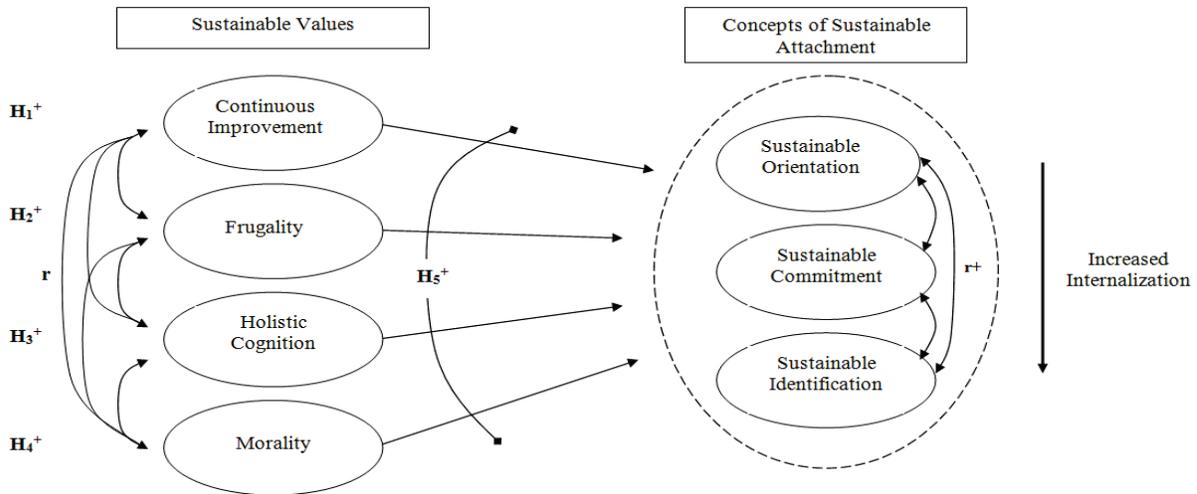
Attachment can also be viewed by degree of individual internalization ranging from recognizing the worth of a concept (i.e., orientation) to incorporation of a concept into one's identity (i.e., identification). I believe that attachment to sustainability runs similar as other causes to which individuals attach themselves. Each sustainable attachment concept will be briefly defined by order of strength of attachment. See Kelman (1957), Chatman and O'Reilly (1986) and Mowday, Porter and Steers (1982) for more in depth reviews on individual modes of attachment. *Sustainable orientation* is the first mode of attachment in the sustainable attachment spectrum. Individuals who demonstrate sustainable orientation have formed a supportive view of sustainability and its tenets (Kuckertz and Wager 2010). Second is the concept of *sustainable commitment* which is a willful attachment to an object or cause (Mowday et al., 1982). Scholars have proposed linkages between individual commitment to environmental practices and sustainable outcomes (Keogh & Polonsky, 1998). *Sustainable identification* involves the greatest level of individual attachment of sustainability since one's self concept is partially defined by the tenets of sustainability (Gagnon and Michael, 2011).

Figure 2 shows the proposed connections (H1-4) with the sustainable mindset values and the three concepts of sustainable attachment. The correlations between the values represent the hypotheses that were generated in each section above and the final hypothesis listed below depicts the proposed

relationship of the values of the sustainable entrepreneur mindset to the three concepts of individual attachment to sustainability.

*H5: The sustainable mindset values of continuous improvement, frugality, holistic cognition and morality will be positively related to the orientation, commitment and identification concepts of sustainable attachment.*

**FIGURE 2  
PROPOSED MODEL OF THE SUSTAINABLE MINDSET**



**STUDY TWO: EMPIRICAL TEST OF THE SUSTAINABLE MINDSET**

After evidence was discovered for the sets of sustainable values that composed the “mindset” of sustainably focused entrepreneurs, the next step was to empirically test these values. I utilized and developed extant scales of the concepts evaluated in the previous section of this work to test the relationships proposed in Figure 2 with 305 students enrolled in entrepreneurship, leadership and business related courses. The sample provided an excellent opportunity to empirically explore the relationships mentioned previously since the majority of Millennial students are concerned about sustainability and many of the students selected have expressed an activated interest in entrepreneurship by enrolling in these courses.

**Sample and Measures**

Pen and paper surveys were administered to a convenience sample of 305 students at a major U.S. university across 16 upper level undergraduate classes in 2010-11. The survey instrument was developed and reviewed by a panel of experts across several disciplines. Respondents were primarily in their early 20’s and 75% were male. Student enrollment by college was approximately 32% agriculture, 45% engineering, 15% business and 8% other.

**Dependent Variables**

Three dependent variables were examined in this study (note Table-1). Respondents were asked to rate their agreement with each item on a 5-point Likert type scale from strongly disagree to strongly agree for all scales used in this work. The first dependent variable is *sustainable orientation*, which was modified from Kuckertz and Wagner (2010). The 6-item sustainable orientation scale was reworded from its original German national focus to a more generic company focus and demonstrated acceptable

reliability ( $\alpha = 0.84$ ). Second we utilized a *sustainable commitment* scale that was developed by Gagnon and Michael (2011) from the affective organizational commitment scale originally developed by Mowday et al. (1982). The four items in this scale were reworded to reflect sustainability as the object of attachment and demonstrated acceptable reliability ( $\alpha = 0.81$ ). The third scale developed was *sustainable identification* developed by Gagnon and Michael (2011) which was modified from Mael and Ashforth's (1992) organizational identification scale. The 5-item scale demonstrated acceptable reliability ( $\alpha = 0.87$ ).

### Independent Variables

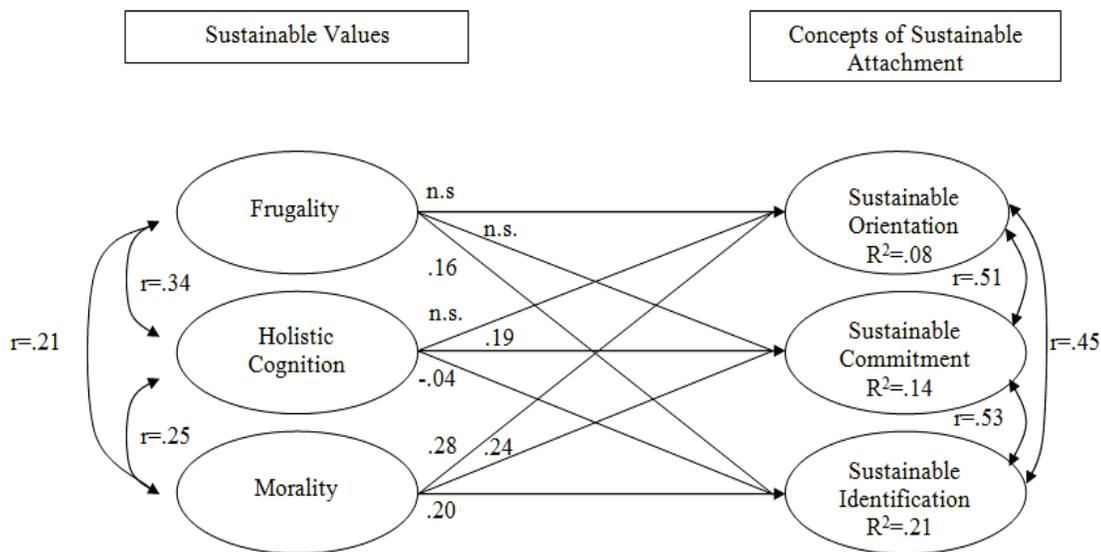
Four independent variables were evaluated in this work. Each is described below and additional scale information is presented in Table 1. A 7-item *continuous improvement* scale was developed from lean manufacturing strategic assessment scales used by Gagnon (2004) and from a review of the literature on lean manufacturing and quality management ( $\alpha = 0.71$ ). *Frugality* was measured using an 8-item scale developed by Lastivicka et al. (1999) ( $\alpha = 0.80$ ). The third independent variable *holistic cognition* was developed from the work of Choi, et al. (2007) and was limited to capture the relatedness elements of holistic cognition. The 10-item scale demonstrated sufficient reliability ( $\alpha = 0.75$ ). Finally a 7-item *morality* scale was used from the IPIP on-line psychology scale collaboratory (IPIP 2011) and it demonstrated fair reliability ( $\alpha = 0.65$ ).

## RESULTS

### Model Fit

Overall, the model presented in Figure 2 demonstrates acceptable fit yet the concept of continuous improvement does not demonstrate any relationships with the three modes of sustainable attachment. Upon further review the concept of continuous improvement was removed from the model and a revised model is presented in Figure 3. Table 2 lists the correlations, means and standard deviations for all the variables considered in these analyses. Initial correlational evidence partially supports hypotheses 1-4 as listed in Figure 2. Even though continuous improvement was removed from the final model, it did demonstrated slight relationships with frugality, holistic cognition and morality.

**FIGURE 3**  
**REVISED MODEL OF THE SUSTAINABLE MINDSET**



**TABLE 2  
CORRELATION MATRIX**

Variable		Mean	SD	1	2	3	4	5	6	7
<b>1. Sustainable Orientation</b>	Pearson Correlation	3.97	0.53	1						
<b>2. Sustainable Commitment</b>	Pearson Correlation	3.97	0.62	.51**	1					
<b>3. Sustainable Identification</b>	Pearson Correlation	3.26	0.66	.45**	.51**	1				
<b>4. Continuous Improvement</b>	Pearson Correlation	4.04	0.43	.02	.14**	.13	1			
<b>5. Frugality</b>	Pearson Correlation	4.06	0.58	.08	.23**	.18*	.34**	1		
<b>6. Holistic Thinking</b>	Pearson Correlation	4.06	0.50	.12	.31**	.09	.38**	.34**	1	
<b>7. Morality</b>	Pearson Correlation	3.71	0.48	.31**	.34**	.23**	.16*	.21**	.25**	1
** Correlation is significant at the 0.01 level (2-tailed)				N=192						
* Correlation is significant at the 0.05 level (2-tailed)										

The model fit statistics are presented in Table 3, which compare the revised model shown in Figure 3 to the initial proposed model and to a highly constrained model (no associations allowed) independence model. The final model Chi-square statistic 6, 7 df, n.s. is very low, which is desired. An ideal model will have a Chi-square of zero and non-significant resulting in a perfect model fit (Maruyama, 1997). Further the confirmatory fit index (CFI) and the normative fit index (NFI) demonstrated excellent fit values that were 1.0 for both indicators (Bentler, 1990). In addition, the parsimony confirmatory fit index (PCFI) and parsimony normative fit index (PNFI) indicate that the model is fairly parsimonious. Finally, the root mean square error of approximation (RMSEA) indicated that the model fit was acceptable. Acceptable RMSEA should be at or below 0.10 (Steiger, 1998).

**TABLE 3  
MODEL FIT STATISTICS**

Model	DF	X2	Diff* X2	RMSEA	CFI	PCFI	NFI	PNFI
Final Model	6	5.8	--	0	1	0.29	0.98	0.28
Proposed Model	7	5.8	1	0	1	0.25	0.98	0.25
Independence Model	28	296	22	0.18	0	0	0	0
*Difference from independence model								
DF = Degrees of Freedom, X2 = Chi-Square Test Statistic, RMSEA = Root Mean Square Error of Approximation Fit Indicator, CFI = Confirmative Fit Index, PCFI = Parsimony Confirmative Fit Index, NFI = Normative Fit Index, PNFI = Parsimony Normative Fit Index								

**Parameter Estimates and Explained Variance**

Overall, I found supportive results for the hypotheses 1-4 as shown in Figure 2. All the values demonstrated slight correlations with each other on the full model. Upon removing continuous improvement the correlations naturally improved. In addition, I found partial support for H5, which primarily was due to the significant relationships between morality and the three modes of sustainable attachment. Further frugality and holistic cognition demonstrated significant paths with sustainable commitment and non-significant paths with sustainable orientation and identification. Continuous improvement was not significantly related to any form of sustainable attachment.

## CONCLUSIONS

It is clear from this research that values matter when it comes to sustainability and that identifying the most salient values will have utility in explaining individual attachment to sustainability. Values influence attitudes, affect and cognitions which ultimately impact behavior (Hofstede and Hofstede, 2005; Rokeach, 1973; Schwartz, 1992; Leiserowitz, Kates, & Paris, 2006). The strength of morality with all three forms of sustainable attachment versus the other values is an interesting finding leading to the question: is sustainability primarily driven by doing the right thing with regard to others? Perhaps sustainability at its roots is the reduction of pure self interest seeking and thus the strong linkage with the value of morality. The positive relationship between frugality and holistic cognition with sustainable commitment and not with sustainable orientation and identification is puzzling. Since commitment is an active personal choice to engage, could frugality and holistic cognition be more activated to better facilitate commitment? Perhaps these values take on a more passive role when it comes to judging others, as in the case of orientation, or are less active under the deeper internalized process of identification. In other words, if one truly identifies with sustainability do the values of frugality and holistic cognition simply become taken for granted? The transformative power of degree of attachment to sustainability is likely to play a role in values activation and salience. These data indicate that depth and type of attachment may activate values differently thus opening interesting avenues of potential discovery.

Although the values in this study emerged from entrepreneur interviews the empirical findings indicate that more needs to be understood about the complex factors that drive entrepreneurs to engage in sustainable focused venturing. In short the findings indicate that some of the proposed values such as morality may be central to a sustainable entrepreneur mindset. However, the centrality of the values of frugality and holistic cognition are less clear. It would be interesting to compare the relationships of values and sustainable attachment in this work to the values of freedom, equality, solidarity, tolerance, respect for nature and shared responsibility as identified by Shepherd, et al. (2009). Further, it would be beneficial to explore entrepreneur value linkages to sustainable attachment and ultimately firm practices in a field setting. The examination of sustainably focused entrepreneurs allows us to better understand the underlying motivational structure of these individuals. If we agree that promoting sustainable venturing is good for society, then understanding the guiding values will help facilitate better recruitment, motivation and training programs for these entrepreneurs. Several scholars argue for the need of individual motivation within an area of practice in order to be successful (Baron, 2008; Cardon, Wincent, Singh and Drnovsek, 2009; Chen, Yoa and Kotha, 2009; Lock and Baum, 2007) and sustainable focused entrepreneurship should be similar.

Another interesting avenue is the interplay of values and outcomes within various entrepreneurial contexts including intrapreneurship. A degree of self interest is necessary for entrepreneurs to be successful and accomplish their objectives. However, how does sustainability fit in when there appears to be conflicting values between self interest and the public good interests of sustainability? The salience of values in certain entrepreneurial contexts would be worth exploring especially when clear tensions exist between supporting sustainability and optimizing firm outcomes. More information on the differences of sustainable focused versus the classic solely for profit entrepreneur should yield helpful insight-especially if the demand for sustainable business models continues to increase. Will we continue to see a sustainable-based values shift as our species places a greater demand on our natural and social resource stocks? Insight on values may allow us to help refocus traditional entrepreneurs through value reprioritization in order to meet the new challenges imposed upon us.

This research has several limitations. The first begins with the qualitative work that identified the emergent set of values espoused by the entrepreneurs. A clear challenge in qualitative research is minimizing researcher bias in data interpretation (Denzin and Lincoln 1998). In this work I made significant efforts to question my assumptions and to not fit the qualitative data into the model of sustainability that exists in my mind. In addition, the samples of entrepreneurs selected are within the agriculture and natural resources space and are likely to be significantly different from entrepreneurs in other industry spaces such as technology. The second series of limitations involves the empirical data that

were used to examine the relationships between the emergent concepts. Common method variance is perhaps the most challenging limitation from the data set (see Podsakoff, MacKenzie, Podsakoff and Lee, 2003 for a review). In addition student data was utilized which is limited in its generalizability. One supportive aspect of the student data was that it was obtained from a group of students enrolled in introductory entrepreneurship and business type classes. These individuals on average are likely to be connected with entrepreneurial activity and many of today's millennial generation undergraduate students express a strong interest in sustainability.

The findings partially address the research questions that guide this study since more is known about sustainable minded entrepreneurs and some of the values that shape their attitudes. Morality appears to be a significant driving value. The other values I evaluated are less clear and require additional examination. Further, the results indicate additional values may be activated in the sustainable entrepreneur's mind and questions arise about value saliency and activation in certain decision contexts. Values do matter with regard to sustainable focused entrepreneurial activity and this work helps make a contribution to the growing space for values research in entrepreneurship.

In practice, understanding the appeal of morality to sustainable focused entrepreneurs and the partial connections of frugality and holistic cognition should help us identify and develop entrepreneurs that are interested in addressing sustainable challenges. Further educational and mentoring programs could be designed to infuse these values with content delivery for increased effectiveness and connection with sustainable minded entrepreneurs. Refocusing on the values that shape entrepreneur attitudes, cognition and ultimately behavior has significant potential for us to better understand "what's behind the blue curtain" of sustainable focused entrepreneurial motivation.

## REFERENCES

- Baron, J. (2008). *Thinking and deciding*. New York: Cambridge University Press
- Bentler, P.M. (1990). Comparative fit indexes in structural models. *Psychological Bulletin*, 107, 238-246.
- Bhide, A. (1992). Bootstrap finance: The art of start-ups. *Harvard Business Review*, 70(6), 109-117.
- Brundtland, G.H.: Address to the World Commission on Economic Development, (1987). Our common future.
- Bryant, P. (2009). Self-regulation and moral awareness among entrepreneurs. *Journal of Business Venturing*, 24, 505-518
- Cardon, M.S. Wincent, J. Singh, J. & Drnovsek, M. (2009). The nature and experience of entrepreneurial passion. *Academy of Management Review*, 34(3), 511-532.
- Chappell, T. (1999). *Managing upside down: the seven intentions of values-centered leadership*. New York, NY: William Morrow & Company.
- Chatman, J. & O'Reilly, J. (1986). Organizational commitment and psychological attachment: The effects of compliance, identification, and internalization on prosocial behavior. *Journal of Applied Psychology*, 71(3), 492-499.
- Chen, X.P. Yao, X. & Kotha, S. (2009). Entrepreneur passion and preparedness in business plan presentations: A persuasion analysis of venture capitalists' funding decisions. *Academy of Management Journal*, 52, 199-214.

- Choi, D.Y. & Gray, E.R. (2008). The venture development processes of “sustainable” entrepreneurs. *Management Research News*, 31(8), 558-569.
- Choi, I. Koo, M. & Choi, J.A. (2007). Individual differences in analytic versus holistic thinking. *Personality and Social Psychology Bulletin*, 33(5), 691-705.
- Chouinard, Y. (2005). *Let my people go surfing: The education of a reluctant businessman*. New York: Penguin Group.
- Cohen, B. & Winn, M.I. (2007). Market imperfections, opportunity and sustainable entrepreneurship. *Journal of Business Venturing*, 22, 29-49.
- Cohen, B. Smith, B. & Mitchell, R. (2008). Toward a sustainable conceptualization of dependent variables in entrepreneurship research. *Business Strategy and the Environment*, 17(2), 107-119.
- Cornwall, J.R. (2010). *Bootstrapping*. Upper Saddle River, NJ: Prentice Hall.
- Dean, T.J. & McMullen, J.S. (2007). Toward a theory of sustainable entrepreneurship: Reducing environmental degradation through entrepreneurial action. *Journal of Business Venturing*, 22, 50-76.
- Denzin, NK, & Lincoln, YS (1998). *Collecting and interpreting qualitative materials*. Thousand Oaks, CA: Sage Publication
- Dees, J. G., and J. A. Starr (1992), “Entrepreneurship through an ethical lens: Dilemmas and issues for research and practice”, in D. L. Sexton and J. D. Karsada, eds., *The State of the Art of Entrepreneurship*. Boston: PWS-Kent Publishing.
- DeYoung, R. (1996). Some psychological aspects of reduced consumption behavior: The role of intrinsic satisfaction and competence motivation. *Environment and Behavior*, 28(3), 358-409.
- Dweck, C.S. (2006). *Mindset: The new psychology of success*. New York: Random House Publishing Group.
- Elkington, J. (1998). *Cannibals with forks: The triple bottom line of 21<sup>st</sup> century business*. Oxford: Capstone Publishing Ltd.
- Finkelstein, S. & Hambrick, D.C. (1996). *Strategic leadership: Top executives and their effects on organizations*. New York: West Publishing Company.
- Fiske, S.T., & Taylor, S.E. (1991). *Social Cognition. 2<sup>nd</sup> Edition*. New York, NY: Random House.
- Gagnon, M.A. (2004). Investigating employee strategic alignment during a transformation to lean manufacturing. *ProQuest Dissertations and Theses*
- Gagnon, M.A. & Michael, J.H. (2011). A confirmatory factor analysis of sustainable Orientation, Commitment and identification, *manuscript to be presented at 2012 OnSustainability Conference Vancouver, BC*
- Glaser, B.G. & Strauss, A.L. (1967). *The discovery of grounded theory: Strategies for qualitative research*. Rutgers, NJ: Transaction Publishers

- Hannafey, F.T. (2003). Entrepreneurship and ethics: A literature review. *Journal of Business Ethics*, 46(2), 99-110.
- Hawkin, P. (1994). *The ecology of commerce: A declaration of sustainability*. New York: Harper Collins.
- Hawken, P. Lovins, A.B. & Lovins, L.H. (1999). *Natural capitalism: The next industrial revolution*. Washington, DC: Earthscan
- Haynie, J.M. Shepherd, D. Mosakowski, E. & Earley, P.C. (2009). A situated metacognitive model of the entrepreneurial mindset. *Journal of Business Venturing*, 25(2), 217-229.
- Hitt, M. Ireland, R.D. Sirmon, D. & Trahms, C. (2011). Strategic entrepreneurship: Creating value for individuals, organizations, and society. *Academy of Management*, 25(2), 57-75.
- Hofstede, G. & Hofstede, G.J. (2005). *Cultures and organizations software of the mind: Intercultural cooperation and its importance for survival*. New York: McGraw Hill.
- International Personality Item Pool, (2001). *A scientific collaboratory for the development of advanced measures of personality traits and other individual differences*, <http://ipip.ori.org>.
- Jones, T.M. & Ryan, L.V. (1997). The link between ethical judgment and action in organizations: A moral approbation approach. *Organization Science*, 8(6), 663-680.
- Kelman, H.C. (1957). Compliance, identification, and internalization three processes of attitude change. *Conflict Resolution*, 2(1), 51-60.
- Keogh, P.D. & Polonsky, M.J. (1998). Environmental commitment: a basis for environmental entrepreneurship? *Journal of Organizational Change Management*, 11, 38-49.
- Kets De Vries, M.F.R. (1993). The dynamics of family controlled firms: The good and the bad news. *Organizational Dynamics*, 21(3) 59-71.
- Kohlberg, L. (1969). *Stages in the development of moral thought and action*. New York, NY: Holt, Rinehart, and Winston.
- Kuckertz, A., & Wagner, M. (2010). The influence of sustainability orientation on entrepreneurial intentions: Investigating the role of business experience. *Journal of Business Venturing*, 25, 524-539.
- Larson, A. (2003). *Demystifying six sigma: A company wide approach to continuous improvement*. New York, NY: Amacom, American Management Association.
- Lastovicka, J.L. Bettencourt, L.A. Hughner, R.S. & Kuntze, R.J. (1999). Lifestyle of the tight and frugal: Theory and measurement. *Journal of Consumer Research*, 26, 85-98.
- Leiserowitz, Kates, & Paris, (2006). Do global attitudes and behaviors support sustainable development? *Environment: Science and Policy for Sustainable Development*, 47(9), 22-38.
- Lichtenstein, S. & P. Dade (2009). Changing societal and executives' values: their impact on corporate governance *International Journal of Business Governance and Ethics*, 3(2), 179 – 203.

- Locke, E. A., & Baum, J. R. (2007). *Entrepreneurial motivation*. In J. R. Baum, M. Frese, & R. A. Baron (Eds.), *The psychology of entrepreneurship* (pp. 93–112). Mahwah, NJ: Erlbaum.
- Lord, R.G. & Foti, R.J. (1986). Schema theories, information processing, and organizational behavior, in Sims, H.P. & Gioia D.A. *The thinking organization: Dynamics of organizational social cognition*, San Francisco, CA: Jossey-Bass, 20-48.
- Mael, F., & Ashforth, B.E. (1992). Alumni and their alma mater: A partial test of the reformulated model of organizational identification. *Journal of Organizational Behavior*, 13, 103-123.
- Maruyama, G.M. (1997). *Basics of structural equation modeling*. Thousand Oaks, CA: Sage Publications.
- McGrath, R.G. & Macmillan, I. (2000). *Entrepreneurial Mindset: Strategies for continuously creating opportunity in an age of uncertainty*. Boston: Harvard Business School Press.
- McKibben, B. (2010). *Earth: Making life on a tough new planet*. New York: Henry Holt and Company.
- Mclean, B. & P. Elkind (2003). *Smartest Guys in the Room: The Amazing Rise and Scandalous Fall of Enron*, New York, NY: Penguin Group.
- Mitchell, J. R. Smith, J.B. Gustafsson, V. Davidsson, P. & Mitchell, R. K. (2006). Thinking about thinking about thinking: Exploring how entrepreneurial metacognition affects entrepreneurial expertise, presented June 10, 2005, Wellesley, MA, Babson College.
- Monga, A.B. & John, D.R. (2008). When does negative brand publicity hurt? The moderating influence of analytic versus holistic thinking. *Journal of Consumer Psychology*, 18, 320-332
- Morris, M.H. Schindehutte, M. Walton, J. & Allen, J. (2002). The ethical context of entrepreneurship: Proposing and testing a developmental framework. *Journal of Business Ethics*, 40(4), 331-361.
- Mowday, R.T., Porter, L.W., & Steers, R.M. (1982). *Employee organization linkages: The psychology of commitment, absenteeism, and turnover*. New York: Academic Press.
- Neisser, U. (1976). *Cognition and reality: Principles and implications of cognitive psychology*. New York, NY: W H Freeman/Times Books/ Henry Holt & Co.
- Nisbett, R.E. Peng, K. Choi, I. & Norenzayan, A. (2001). Culture and systems of thought: Holistic versus analytic cognition. *Psychological Review*, 108(2), 291-310.
- Ohno, T. (1988), *Toyota Production System: Beyond Large Scale Production*, Cambridge, MA: Productivity Press
- Parris, T.M. Kates, R.W. (2003) Characterizing and measuring sustainable development. *Annual Review of Environment and Resources*, 28, 559-586.
- Parrish, B.D. (2010). Sustainability-driven entrepreneurship: Principles of organization design. *Journal of Business Venturing*, 25(5), 510-523.
- Pepper, M. Jackson, T. & Uzzell, D. (2009). An examination of the values that motivate socially conscious and frugal consumer behaviours. *International Journal of Consumer Studies*, 33, 126-136.

- Podsakoff, P.M. MacKenzie, S.B. Podsakoff, N.P. & Lee, J.Y. (2003). Common method biases in behavioral research: A critical review of the literature and recommended remedies. *Journal of Applied Psychology*, 88(5), 879-903.
- Rokeach, M. (1973). *The nature of human values*. New York: The Free Press.
- Savitz, A.W. & Weber, K. (2006) The triple bottom line: How today's best-run companies are achieving economic, social and environmental success – and how you can too. San Francisco, CA: Jossey-Bass.
- Schein, E.H. (2010). *Organizational Culture and Leadership*. San Francisco, CA: Jossey-Bass
- Schlange, L.E. (2006). What drives sustainable entrepreneurs. *Applied Business and Entrepreneurship Association International*
- Schwartz, S. H. (1992). Universals in the content and structure of values: Theoretical advances and empirical tests in 20 countries. In M. Zanna (Ed.), *Advances in experimental social psychology*, 25,1-65. Orlando, FL: Academic.
- Shepherd, D.A. Douglas, E.J. & Fitzsimmons, J.R. (2008). MBA admission criteria and an entrepreneurial mind-set: Evidence from "western" style mbas in india and Thailand. *Academy of Management Learning and Education*, 7(2), 158-172.
- Shepherd, D. Kuskova, V. & Patzelt, H. (2009). Measuring the values that underlie sustainable development: The development of a valid scale. *Journal of Economic Psychology*. 30(2), 246-256.
- Shepard, D.A. & Patzelt, H. (2011). The New Field of Sustainable Entrepreneurship: Studying Entrepreneurial Action Linking “What Is to Be Sustained” With “What Is to Be Developed”. *Entrepreneurship Theory and Practice*, 35, 137-163.
- Sirsly, C.A.T. (2009). 75 years of lessons learned: chief executive officer values and corporate social responsibility. *Journal of Management History*, 15, 78-94.
- Steiger, J.H. (1998). A note on multiple sample extensions of the RMSEA fit index. *Structural Equation Modeling: A Multidisciplinary Journal*, 5(4), 411-419.
- Strauss, A. & Corbin, J. (1998) *Basics of qualitative research: Techniques and procedures for developing grounded theory*. Thousand Oaks, CA, Sage Publications.
- Teal, E.J. & Carroll, A.B. (1999). Moral reasoning skills: Are entrepreneurs different? *Journal of Business Ethics*, 19, 229-240.
- Trevino, L.K. (1986). Ethical decision making in organizations: A person-situation interactionist model. *Academy of Management Review*, 11(3), 601-617.
- Werbach, A. (2009). *Strategy for sustainability*. Boston, MA: Harvard Business Press.
- Windborg, J. & Landstrom, H. (2000). Financial bootstrapping in small business: Examining small business managers' resource acquisition behaviors. *Journal of Business Venturing*, 16, 235-254.

Womack, J.P. & Jones, D.T. (1996). *Lean thinking: Banish waste and create wealth in your corporation*. New York: Free Press.

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