

"WATCH OUT, ISAAC!!" - RE-CONSTRUCTING ENTREPRENEURIAL INTENTIONS

Malin Brännback: Åbo Akademi University School Of Business, Turku, Finland

Alan Carsrud: Florida International University, Miami, United States of America

Jill Kickul: Miami University, Oxford, United States of America

Norris Krueger: Entrepreneurship Northwest, Boise, United States of America

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Contact: Norris Krueger, Entrepreneurship Northwest, Boise, Boise, ID 83706, United States of America, (T) (208) 440-3747, (F) (208) 426-1857, Email: norris.krueger@gmail.com

ABSTRACT

The rise of entrepreneurship as a field of study has been marked by a parallel rise in theoretically-sound, empirically robust formal measures and models. One highly visible class of models has been those directed at explaining and predicting entrepreneurial intentions. The basic intentions model, drawn from Ajzen's Theory of Planned Behavior (1991) and Shapero's model of the entrepreneurial event (1982), has proven widely useful to researchers (Krueger & Brazeal, 1994; Krueger, 2000; Krueger Reilly & Carsrud, 2000). However, recent evidence suggests that the entrepreneurial intentions may require considerably more sophisticated modeling (e.g., Krueger & Kickul, 2006; Brannback et al., 2006). Moreover, even the most robust linear model of intent does not fully capture the dynamics of intentions per se, nor do they necessarily capture the deeper cognitive structures and processes that lay beneath the intentions model as presently conceptualized. Our paper will present a series of research findings that address multiple aspects of how entrepreneurial intentions evolve and coalesce, from a variety of perspectives and experiences. Doing so affords us the opportunity to explore some fascinating anomalies in recent tests of the intentions model.

Key Words: Entrepreneurial intentionality, replication, contextuality, causation

INTRODUCTION

The field of entrepreneurship is still seeking a unified definition of entrepreneurship and consequently an underlying theory. It has been claimed numerous times that the field is in its infancy because of this shortfall (Gartner, 1988, Stevenson and Jarillo, 1990, Brazeal & Herbert, 1999, Aldrich & Martinez, 2001). A slight consolation is the view that 'big brother' strategic management appears to continue to suffer from the same problem (Mintzberg et al, 1998, Mintzberg, 2004). Strategy considers itself far more mature and developed than it appears in comparison to how scholars of entrepreneurship consider their field. In fact, very few fields have a unified theory, even if they are considered well-established. There is a very real possibility that seeking a unified definition or theory is in fact a complete waste of time. Physics' efforts to create a unified theory dates to Einstein and has come up short. However, in the process the field has learned much even as the unified theory remains tantalizingly out of reach. On the other hand, entrepreneurship lacks not only that type of unified theory, but also lacks any real sense of what that unified theory might look like beyond a few key themes: Opportunity-seeking, Knightian uncertainty, growth, the emergence of new entities, and a growing sense that entrepreneurship is less a state than a process that involves some sorts of cognitive processing (Knight, 1921, Kirzner, 1973, 1979, Gartner, 1988, Stevenson &

Jarillo, 1990, Davidsson, 1991, Krueger & Brazeal, 1994, Reynolds and White, 1997, Krueger, 2000, Krueger et al, 2000, Shane, 2000). What possible theory gets us from opportunity to emergence?

Our paper examines theory development within entrepreneurship specifically through the lenses of entrepreneurial intentionality. Do we have a theory of entrepreneurial intentionality? If not, why are some of the reasons why we have failed to develop and advance our own theory? With a special emphasis on replication and measurement (i.e., there is a wealth of intentionality studies available that have proven the theory of planned behavior robust and valid, we address this key issue. With so many studies using the model grounded on the theory of planned behavior, one could argue that this model could be considered a theory of entrepreneurial intentions. However, we find additional studies that are either extensions or derivatives, with incorporating and measuring other variables not central to the core model. Thus, it is not surprising that results occasionally support and do not support previous results. What is more disconcerting, however, is that no studies appear to seriously challenge the model. Why is this? Should we not attempt to challenge existing models when we try to advance science?

This paper wrestles with the issue of whether we really can conduct research in the Popperian fashion, i.e. that any theory is subject to falsification (Popper, 1959). Falsification requires replication, in order to enable revision and replacement (Kelly, 1955). We argue that replication is essentially impossible, yet theory development requires it. We argue that this may be why entrepreneurship – and any other field in social science - is likely to fail to ever develop a truly unified theory. And, of course, what would we be falsifying if we do not have at least an implicit theory in the first place!

Numerous efforts to conduct inventories of the entrepreneurship field, as to what theoretical constructs have been *en vogue* during which period and which fields have influenced the development of entrepreneurship. These studies, however, provide little normative guidance to how theory development really should be carried out in the field. They remain elaborate descriptions that are instrumental for researchers entering the field who need the field mapped out. A recent issue of *Entrepreneurship Theory & Practice* contains four articles that prove the diversity and the interdisciplinary nature of the field (Grégoire et al, 2006, Cornelius et al, 2006, Schildt, et al, 2006, Reader & Watkins, 2006). The conclusions are similar to some degree, but then again very different and do not offer normative guidance as to how the field should conduct theory development.

More directly, we do not think there is a theory of entrepreneurship *per se*. We think the field should accept that the phenomenon is multi-faceted and situationally embedded irretrievably in multiple external environments (e.g., social/cultural). That is, we must accept and embrace the inherent *contextuality* of entrepreneurship. Accepting contextuality raises questions with respect to replications of empirical studies in different contexts (be it cultures or industries or environments). Is this fruitful? To what degree can we generalize the results? Will the results only be a way of generating new (interesting) research questions and avenues (not bad in itself either by the way)? In other words, what will become of the keenly sought for *so what* of a unifying theory?

This issue is not only one of philosophy of science -- it is also one related to our field and our reward systems in the academic world. Let us tackle the issue of replication along these three dimensions through the lenses of entrepreneurial intentionality studies.

PURPOSIVE REPLICATION

A central cornerstone in scientific work is to be able to replicate studies carried out elsewhere. We should here perhaps emphasize research in the *physical and biological sciences*. For example, clinical tests in medicine rest fully on the idea of replication. Any other research group should be able to reach the same research results with another sample, or the results should stay within specific limits. One gram of water weighs one gram in Finland, France, the US, or China – but not on the moon! (Mass is the same, yet the weight differs; the theory holds, but proves more complex than immediately evident.) Moreover, many national patent laws *require* replication, i.e. somebody else should actually be able to build the device. However, this suggests that replication need be purposive, seeking to limit and delimit the scope and applicability of models (and variables and even theories) in question.

Theory development following the Popperian tradition rests on the idea that any theory is subject to falsification (Popper, 1959) or as expressed by Kelly (1955, p.15): "...all our interpretations of the universe are subject to revision or replacement". Hence replication can be seen as serious attempts to revise or replace. Therefore, one would expect to find replication as an accepted way of advancing scientific knowledge. However, reality is quite different.

Consider a situation where a researcher (in social sciences) faces the options of trying to replicate or not. If, the researcher opts for replication the researcher immediately faces serious hazards, i.e., failing journal publication or worse yet an unsuccessful tenure attempt. These are indeed serious, as journal publication is the strongest mechanism for validating new knowledge and gaining tenure. Therefore, the researcher is more likely to engage in *versioning*, i.e., taking parts of a previous study, add or exclude or modify some of the variables or conduct a study within a different sample or within a different context. Results therein become extensions and enrich our knowledge but, ironically, may fail to accurately test whether the underlying model itself is truly valid or whether the essential core of the model is context-specific. Nor do we truly identify in any rigorous fashion the limits and delimits of the model (and thus build theory).

(Insert Figure 1 about here)

Let us think in terms of a decision tree (Figure 1). The first question is whether we attempt to replicate a study at all. While it is imperative to subject a model to rigorous, skeptical testing, as scholars, we are rewarded far more for novel work. As noted, even a well-executed replication is unlikely to be published in a top journal. Instead, we may accept our findings and build theory, even if it is a single study. Given the perils of generalizing from even the best crafted theory, we run a very real risk of building theory that resemble a house of card built upon shifting sands. The early days of entrepreneurship research built a somewhat impressive edifice on essentially spurious findings from flawed work based on the mis-understood "sands" of personality trait psychology. When scholars like Brockhaus, Shapero and others showed that personality trait psychology was the wrong path, the edifice crumbled (Brockhaus 1982, Shapero, 1982). Yet, to this day the damage remains as many psychological theories are often excluded from use by entrepreneurship researchers (a bit of throwing out the "baby with the bath water"). It took years to put cognitive psychology back into entrepreneurship research literature given the turn made towards the entrepreneurial process and organizational theory.

Our second issue is whether the replication offers confirming or disconfirming evidence. Again, a replication that "merely" confirms prior results is less publishable. On the other hand, a replication that disconfirms the model may be resisted by reviewers who have a vested interest in the validity of the model (e.g., a reviewer who has used that model extensively).

Given all this, is it any wonder that we see such little true replication in entrepreneurship research? These dynamics are even stronger where the model/theory in question is well-established in other domains. Consider, for example, formal models of intentions, an ideal domain for replication yet the model seems treated more like a law of nature. Kuhn (1970) pointed out that truly assessing the limits and delimits of a theory requires a significant accumulation of replication, but as normal science is not as well rewarded, a theory's flaws may go undetected for some time, even if the flaw is fatal.

ENTREPRENEURIAL INTENTIONALITY

Entrepreneurial intentionality studies represent a research area for predicting the entrepreneurial potential across different ontological dimensions. The entrepreneurial intentionality model draws on two theories (*i*) the theory of planned behavior (Ajzen, 1987), and (*ii*) Shapero's entrepreneurial event (Shapero, 1982) that have been shown to be equally powerful in predicting entrepreneurial activity (Krueger et al, 2000). More important, the model (Figure 2) held in virtually every study, even where researchers took considerable liberties with model specification or measurement. That is, path analysis confirms that the correlation between attitudes and behavior is fully explained by the attitude-intention and intention-behavior links (Kim & Hunter, 1993). Moreover, formal intentions models have already been applied successfully to entrepreneurial behavior (e.g., Krueger & Brazeal, 1994; Davidsson, 1991). Yet, have we ever pushed the model to the breaking point? And who then should take responsibility for doing so?

(Insert Figure 2 about here)

For those readers who are less familiar with the intentions model, let us drill down a little deeper into the critical components of the intentions model. According to the model, entrepreneurial intentions are dependent on personally perceived desirability and feasibility. Desirability in turn is influenced by social norms, although social norms have not always been shown to have a significant impact (Krueger et al, 2000). Hence shown in Figure 1 and according to Ajzen's theory of planned behavior, perceptions of desirability and feasibility explain (and predict) intentions significantly. Intentions toward pursuing an opportunity are best predicted by three critical perceptions: that the entrepreneurial activity is **(a)** perceived as personally desirable, **(b)** perceived as supported by social norms, and **(c)** perceived as feasible. However, it could be expected that social norms vary across cultures, i.e., in some countries social norms are more supportive of entrepreneurial activity than in others (Krueger & Kickul, 2006). Feasibility is impacted by perceived self-efficacy. The factors that constrain entrepreneurial activity on the other hand are rarely studied but it can be assumed that they vary and that the variation is influenced by culture.

Demonstrated Antecedents of Intentions

Perceived Desirability - Personal Attitude: In the Ajzen-Fishbein framework, personal attitude depends on perceptions of the consequences of outcomes from performing the target behavior: their likelihood as well as magnitude, negative consequences as well as positive consequences, and especially intrinsic rewards as well as extrinsic (in short, an expectancy framework). The model also argues that these perceptions are learned. With respect to what can be regarded as personally desirable or what kind of behavior is considered worthy of a reward and what is not can vary across cultures. For example, while personal wealth creation from starting ones own business is considered a measure of achievement and personal success in the US, attracting admiration and praise, the situation is different in for example Sweden and Finland. The reaction is that of awe and envy. While bankruptcy is perhaps not considered something to aim for, it is not the 'end of the world' in the US. In fact, there are those who regard it as an effective learning process. In Australia, Finland and Sweden and most of Europe, it is the end of the day. Success in Finland and Sweden can be as much a sin as failure.

Perceived Desirability - Social Norms: Social norms represent perhaps the most interesting component of the Ajzen-Fishbein framework. This measure is a function of perceived normative beliefs of significant others (e.g., family, friends, co-workers, etc.) weighted by the individual's motive to comply with each normative belief. Social norms often reflect the influence of organizational (or community) culture. That is, the impact of climate and culture on intent operates by its impact on perceptions of desirability (and perhaps feasibility as well). Bryant and Bryant (1998) show that as social norms in a community change that in turn changes what is more likely to be seen as an opportunity. Measuring social norms does require identifying the appropriate reference groups. The reference-group for a potential entrepreneur need not be family and friends, rather the perceived beliefs of their colleagues (including those who have already started a venture) and also likely entails multiple stakeholders. Social norms provide guidelines for what in a culture is regarded as desirable behavior. In other words decisions are embedded in social norms (March, 1988a, 1988b) and consequently so is entrepreneurship. For example, if the norm is that a person with an academic education seeks employment in a large firm or public organization to climb the career ladder rather than start their own business, it is obvious that starting a firm will not be considered an opportunity, most likely only something that occurs in society among any other event. Although we understand that social norms vary, most research tend to show that social norms do not explain additional variance in intentions (see, for example, Krueger et al, 2000). However, one study among Finnish technology students shows a significant link between social norm and intentions (Grundsten, 2004), but in another (Brännback et al, 2005) among Finnish business students social norms do not appear to impact but in a third including Hispanic undergraduate students in Florida, US they do (Brännback et al, 2006). These studies are also replications, i.e. using the same instrument, so how do we explain these results? But as pointed out by Krueger & Kickul (2004), if social norms are valid constructs, cultural contexts should be reflected in them, perhaps not as real measures but at least as a proxy.

Perceptions of Feasibility - Self-Efficacy: Self-efficacy is our sense of competence, belief that we can do something specific (Bandura, 1997, 2001) and that self-efficacy is a strong driver of goal-oriented behavior (Baum and Locke, 2004, Bandura, 1997, 2001). The concept reflects an individual's innermost thoughts on whether they have the abilities perceived as important to task performance as well as the self-confidence that they will be able to effectively convert those skills into a chosen outcome (Bandura, 1989; 1997). Self-efficacy is related to one's choice of activities and one's tenacity, one's emotional reactions when failing (Bandura, 1997; 2001). Thus, self-efficacy is concerned with *one's judgment of what one can do with whatever skills one possesses* not with the actual skills one has (Chen et al, 1998, Markham et al, 2002). Hence taking action requires consideration of not just outcome expectancies (i.e., desirability) but also perceived self-efficacy (i.e., feasibility).

Self-efficacy perceptions play a powerful role in managerial and employee behavior yet have been found to distinguish managers from entrepreneurs (Chen et al, 1998). For instance, gender and ethnicity differences in work interest and performance can often be traced to differences in self-efficacy, supporting self-efficacy's role in the empowerment of organization members. Preliminary evidence also suggests that females have both lower entrepreneurial self-efficacy and lower entrepreneurial intentions (Chen et al., 1998; Chowdhury et al, 2002; Gatewood et al., 2002; Kourilsky & Walstad, 1998). Additionally, consistent with earlier studies, evidence suggests that females focus more on perceived skill deficiencies in the entrepreneurial realm. Kourilsky & Walstad (1998) compared perceptions of knowledge with actual knowledge of entrepreneurial skills, and showed that while skill levels of boys and girls were comparable, girls were more likely to feel ill prepared. Support for this was found by Wilson et al. (2004) who demonstrated a direct relationship between self-efficacy and intentions in girls, and highlighted the significance of girls' self-efficacy on their entrepreneurial aspirations.

We also see cultural differences (Bandura, 1997). Increasing self-efficacy requires more than just teaching competencies; students and trainees must fully internalize the competencies. Thus, they carry an embeddedness similarly to culture (Schein, 1985). However, self-efficacy can also be collective, i.e. support from other organizational members of an intention can be important and are needed to support an intention, thus perceptions of collective efficacy are likely to be important (Bandura 1986, 1995). It is highly likely that collective self-efficacy enforces social norm and low collective self-efficacy can decrease high personal self-efficacy as to ultimately inhibit action, i.e., social norms, self-efficacy, and culture are tightly interconnected (Figure 3).

(Insert Figure 3 about there)

As mentioned above, research has also shown that gender impacts intentionality – in often complex fashion (Chen et al, 1998, Wilson et al, 2004, Krueger and Kickul, 2006). As this study shows age is also an important factor and can be seen as a measure of life experience. Age can be a dimension of culture (level of respect elders have in a culture) and cognitive style (based on experiences and cultural norms) (see, for example, Hofstede, 1984). This is not surprising as entrepreneurial activities involves multiple decision and findings from decision theory alone hold that cognitive style influences decision making both of which are influenced by culture (March 1988).

Abraham and Isaac? (Killing your OWN theory?)

The Old Testament tells of the patriarch Abraham being persuaded to put his only son at great risk. Despite the risks of losing his only son, Abraham's faith in the process led ultimately to his being able to grow his faith. How many scholars consider their own models to be as dear as a child? What if that model is widely-used and widely-lauded?

We suggest here that for entrepreneurship to advance as a field that we trust the process of knowledge development, but that may only happen if the champions of that model take the responsibility to put the model to the acid test. A recent study shows that local context, social norms and cognitive style interact and may explain why entrepreneurs' intentions evolve along different pathways (Krueger and Kickul, 2006). The study suggests that culture impacts cognitive style and that entrepreneurial intensity varies with cognitive style and across cultures. That is, country specificity is found to

influence social norm and desirability and gender influences both social norm and self-efficacy (Figure 4). However, the Krueger and Kickul (2006) study also found that differences in cognitive style (analytic versus intuitive) actually *changed* the specification of the model. Intuitives arrive at intentions by a different path than do analytics. That is, if we consider contextuality (here, the score on the Cognitive Style Index), we see very different models of entrepreneurial intentions.

(Insert Figure 4 about here)

WHEN THE 21ST STUDY COMES ALONG – OR WHAT HAPPENS WHEN LOOKING OUTSIDE THE BOX

But, what are we replacing or revising? And, are we really questioning previous research results? And, are we really looking hard enough at intentionality? With respect to *entrepreneurial intentionality* replacement or re-visioning is probably what is going on. If we are looking at the intentionality studies, we find that most researchers have accepted the core model, with occasional deviations, which have not been significant. This, however, works in favor of advancing the evolution of knowledge by providing a more attractive “target” for replication. If the model is robust, why can it not be accepted as *a theory for entrepreneurial intentions*? Why not accept it as a theory, which then is subject to revision and replacement? These questions are of course valid if we are seeking *a theory* following the positivistic tradition. But, are we really challenging our assumptions? While it is obvious that entrepreneurship research does not represent a field of positivistic theory development, it does appear that the field cannot accept theories that are not generated in this manner. Because of these variations in research results, we are then forced into the phenomenological corner of interpretations of reality in order to explain our results. However, by claiming that the entrepreneurial intentions model as championed by Krueger and others is at least “a” theory of entrepreneurship, that bold claim could inspire replication that seeks to limit, even disconfirm that model.

A very real dilemma is, of course, when do we stop looking for more research results? If we have 20 ‘good’ tests is that enough? What happens when the 21st that comes along proves the previous 20 wrong? Why would, for example, entrepreneurial intentionality studies be at all interesting any more? Is it because of these small variations that do occur, that render the results at least *interesting*? Are we really advancing theory at all or just expanding our empirical knowledge of entrepreneurial intentions and actually generating more research avenues? Are we really finding any answers? Or, are we really looking hard enough? And, are we asking the right questions? What about looking elsewhere? Could intentionality occur in other situations? Interesting questions indeed! Let us illustrate this with examples where the results differ from the expected and where the explanations to the variations most likely are found in factors and phenomena that are not considered significant factors or that in explaining their effects would require considerable local knowledge. The reasons may be, for example, embedded in the inter-relation of social norms, culture, and collective self-efficacy that are unique for that particular context.

We started by accepting our own challenge. We turned a critical eye to a model known for its theoretical rigor and empirical robustness. We looked through a slightly different lens and asked a couple of very simple questions. First we asked: what if we simply move from a linear additive model to the multiplicative model such as those favored by economists? What if intent requires both desirability and feasibility, then we can argue this is best captured by a set theoretic model. The set of intended actions is the intersection of the set of desirable actions and the set of feasible actions. In practice, the linear additive model is “close enough” – however, we surrender significant richness in our potential understanding of entrepreneurial phenomena, richness that should also enable us to better assist entrepreneurs, policy makers and students.

Anchoring. Cognitive science tells us that humans tend to think in terms of sets, not in terms of linear regression equations. If intentions lay at the intersection of the set of perceived feasible options and the set of perceived desirable options, then we no longer have a compensatory decision calculus. That is, both desirability and feasibility must be at least adequate for intentions to surface, one cannot compensate for the other if it is too low. In turn, this suggests that a multiplicative model is a better specification (cf. Reitan 1997).

Evoked Opportunity Sets: Non-Compensatory Decision Making. Why is this important? Important human decisions are inherently complex. In purely compensatory decision making, there are always tradeoffs, but in non-compensatory (or lexicographic) decisions, there will be non-negotiable decision criteria. Human decisions that involve multiple criteria almost always include at least one non-compensatory attribute (which is often far from obvious). Recent work by Krueger, Kickul, Gundry & Verma (2006) examined the key attributes of intended ventures and found clear evidence for intentions reflecting significant lexicographic (non-compensatory) preferences. If human decision making – such as decisions relating to the intent toward launching a venture – is a mix of compensatory and non-compensatory decision criteria, our linear additive models may leave much useful information unaddressed. However, what of capturing the *dynamics* of the process? If intentions evolve over time as we already surmise (e.g., Krueger 2000), let us next examine that with some remarkable findings from a very recent study.

Reciprocal Causation? Recent work by Brännback et al. (2006) and Krueger & Kickul (2006) both stumbled across an unusual finding. While perceived desirability and perceived feasibility were significant antecedents of intentions, as expected, a rudimentary test using the logic of Granger causality found that desirability and intent also clearly predicted feasibility and that feasibility and intent clearly predicted desirability – almost equally. In fact, the Brannback et al. data (see Figure 5) seems to suggest that feasibility may prove – statistically – to be the dependent variable.

Note that when intent is the dependent variable, $R^2 = .462$ and driven by desirability ($\beta = .547$) and feasibility ($\beta = .217$). When desirability is the dependent variable; $R^2 = .464$ and is driven by feasibility (.222) and intent (.545). When feasibility is the dependent variable, $R^2 = .284$ and driven by desirability (.297) and intent (.289). Reciprocal causation seems a reasonable conclusion.

(Insert Figure 5 about here)

Allport long ago (1935) argued that behavior was predicted by triumvirate of “intention”-like constructs: Cognitive, affective and conative (which very roughly correspond to feasibility, desirability and intent to act). Behavior tends to occur only when all three predictors are in place. Empirically, though, Allport’s troika tended to be inter-correlated strongly. Whether or not one prefers the existing intentions model or Allport’s older conception, we need to ask: *Are they overlapping constructs or is something much more interesting going on?*

Figure 5 argues for the intentions model having feedback loops. If we can convert the intentions model into a model of changing intentions, we can readily present strong theory for intentions influencing its “predictors”. More important, we can use this newly-enriched model of entrepreneurial intentions to better serve our communities, organizations and students.

At this point we had more questions than answers that mandated a rigorous search process for potential answers. Again we stumbled, and across some fascinating research that may take us in the direction of true revision *for the purpose of advancing our theoretical knowledge of entrepreneurial intentionality that will require more empirical studies.*

While entrepreneurship appears to have accepted the Ajzen & Fishbein model of Theory of Planned Behavior (TPB) others have not quite swallowed that bait. In fact there is a considerable body of critique and theoretical developments available in the field of consumer marketing (see, for example Bagozzi & Warshaw, 1990, Bagozzi & Kimmel, 1992, Bagozzi, 1992, Bagozzi, 2000a, b, Bagozzi et al, 2003, Bay & Daniel, 2003) and psychology (Liska, 1984, Fazio & Williams, 1986, McBroom & Reed, 1992, Taylor & Gollwitzer, 1995, Brunstein & Gollwitzer, 1996, Gollwitzer & Brandstätter, 1997, Gollwitzer & Schaal, 1998, Sheeran et al, 2005) that needs to be incorporated into the entrepreneurial intentionality research. When reviewing these sources we find that the fundamental critique of TPB rests on the fact that TPB does not deal skillfully with *when an intention becomes real action* and TPB does not deal with the possibility that intentions may be obstructed, that there are potentially controllable, but much more so uncontrollable impediments that may contribute to *inaction*. A large proportion of this research focuses on understanding the relationship between attitude and behavior and how attitude impact desire. For example, McBroom and Reed (1992, p. 205) point out that research has shown that attitudes cause behaviors, that behaviors cause attitudes, that reciprocal causation exists, that the two are unrelated or that the two are caused by something

else. They also point out that the conditions under which attitudes cause behavior is not adequately determined.

Gollwitzer and Brandstätter (1997) present the idea of implementation intentions and goal pursuit, where the latter is a pre-decisional phase when potential action goals which are linked to a person's desires and the former a post-decisional phase when a person plans to implement the goal (Taylor and Gollwitzer, 1995). How does this fit within the context of entrepreneurship? Consider all the work suggesting that entrepreneurs engage in effectual thinking. The decision to launch a venture should be independent of future steps along the way as nascency proceeds. At worst, this evidence is sufficient to begin planning for revising some of our taken for granted assumptions. All this adds theoretical support for this new empirical evidence that the processes underlying intent are indeed more complicated than TPB, etc. suggest. Bagozzi et al (2003) elaborating on a previous model (Bagozzi 1992) presented a refined model of TBP (Figure 6) and as can be seen it is more detailed.

(insert Figure 6 about here)

Immediately several questions arise that we as scholars must ask carefully. When measuring perceived personal desirability as called in entrepreneurial intentionality, is that goal desire or implementation desire? Based on the literature it appears to be goal desire and entrepreneurial intentionality appears to be goal intentions and decision process confidence what is labeled self-efficacy within entrepreneurship (not perceived behavioral control influencing implementation intentions). Moreover, goal feasibility is an antecedent to perceived behavioral control and not the other way around as in entrepreneurial intentionality studies. In fact, the entrepreneurial intentions model appears to have much more in common with Gollwitzer's model of action phases (MAP) (Gollwitzer, 1996). That model suggests that there are phases of action and that the entrepreneurial intentionality model only identifies goal intentions, i.e. the predecisional phase. Therefore, it becomes necessary to test the Bagozzi et al (2003) and an earlier version by Dholakia and Bagozzi (1992) and Gollwitzer's MAP and compare with earlier studies of entrepreneurial intentionality. We look forward to that challenge.

CONCLUSION – WHERE DO WE GO FROM HERE?

In our paper, we have offered some thoughts about the role of replication in entrepreneurship research, using the dominant model of entrepreneurial intentions (Krueger 2000; Krueger et al., 2000). We have made some suggestions for how to use contextuality to guide our replication. However, the dirty little secret is the one with which we began, one that reflects the contextuality of the academic field: That replication is not particularly rewarded, even if findings offer significantly disconfirming evidence (and disconfirming evidence need not be even accepted). We cannot advance knowledge in entrepreneurship research absent that critical, skeptical testing that only replication offers. We can spur replication by explicating the opportunities that replication (or even versioning) can offer (reviewers and editors should insist that authors help the reader by providing the most promising ways to further test the model. How many authors include information on what it would take to falsify their work?

However, we have offered two recent theory-driven studies that demonstrate the power of purposive replication that mindfully (and, dare we say, intentionally?) seeks to limit and delimit one well-received model. One study from a larger inquiry in social entrepreneurship (Krueger, Kickul, Gundry & Verma 2006) demonstrates the limits to linear additive models. The other, developed specifically for this paper, demonstrates that even in a static data set, we see clear evidence of entrepreneurial intentions as a dynamic process replete with apparent feedback loops. The broader literature on behavioral intentions invariably bemoans the lack of a theory of changing intentions and work on entrepreneurial intent is no different. Simply drawing on strong theory from cognitive science offers fresh insights that both limit and delimit the intentions models so widely used.

How else might we proceed?

One possible approach given the plethora of published and unpublished research on intentionality may be through the use of meta-analytic techniques based primarily in the psychology literature. A meta-analysis of the intentions model allows us to test and confirm multiple and competing explanations for many of our findings. For example, rather than relying on a set of homogenous and possibly flawed assumptions to conduct our research, we can further examine how the moderating

effects of culture and gender can influence entrepreneurial perceptions, self-efficacy, and intentionality. A series and sequence of moderating tests can reveal the relative importance of found differences in how individuals perceive their immediate, social, and cultural environments on the pathway to intentionality. Additionally, from a measurement perspective, we also have an opportunity to investigate how researchers have designed their own or replicated others research design in confirming the initial beliefs and decisions behind the eventual formation of entrepreneurial intentions. Through meta-analysis, we can even make the model “worthy” of “attack” by making bold claims of universality.

In any event, these replications must be driven by strong theory, not by *ad hoc* data mining. Given the field of entrepreneurship’s early legacy of inappropriate theory (e.g. personality trait psychology) and *ad hoc*, data-driven and un-replicable studies, we have taken the first step by rigorously applying theoretically-sound, empirically-robust models such as our intentions models. However, the next step in genuine theory development is to test such models in light of equally compelling theory and equally compelling assumptions. However, as Kuhn and others have pointed out, a widely-received, popular model that yields effective results with reasonable consistency is difficult to modify, let alone displace, even if fatally flawed. Entrepreneurship is still a nascent field that is criticized for weak theory; how then do we ask entrepreneurship scholars to critique one of its few recognized strong theories?

As such, we offer one strong suggestion: We may be compelled to ask the “parents” of our models, constructs, measures and theories to take the responsibility to put their own “children” at risk. So....

Where is Abraham?

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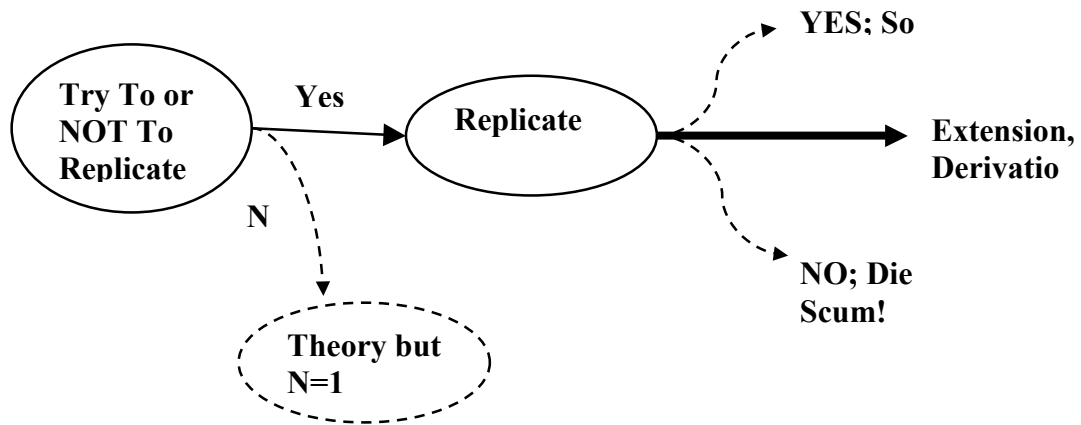


Figure 1. To Replicate or Not?

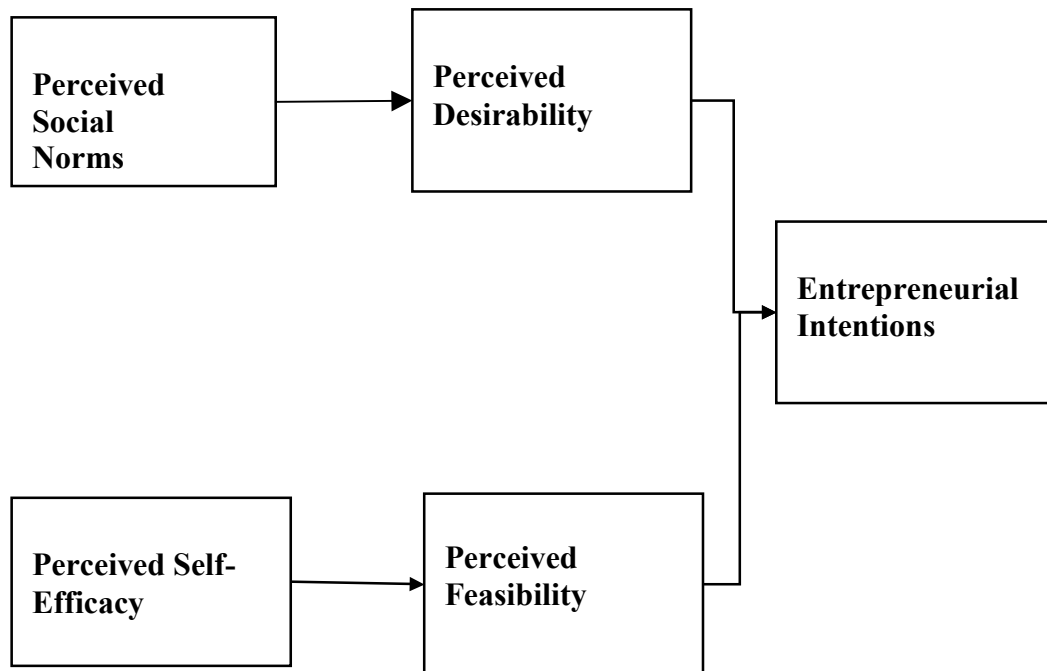


Figure 2. The Entrepreneurial Intentions Model (adapted from Shapero, 1982; Krueger, 1993; Krueger & Brazeal, 1994; Krueger, et al 2000)

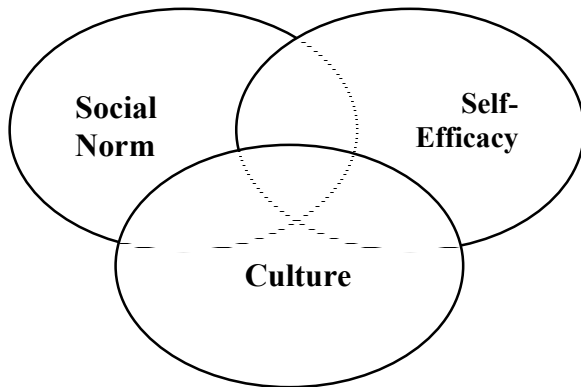


Figure 3. Interrelatedness of social norm, self-efficacy, and culture

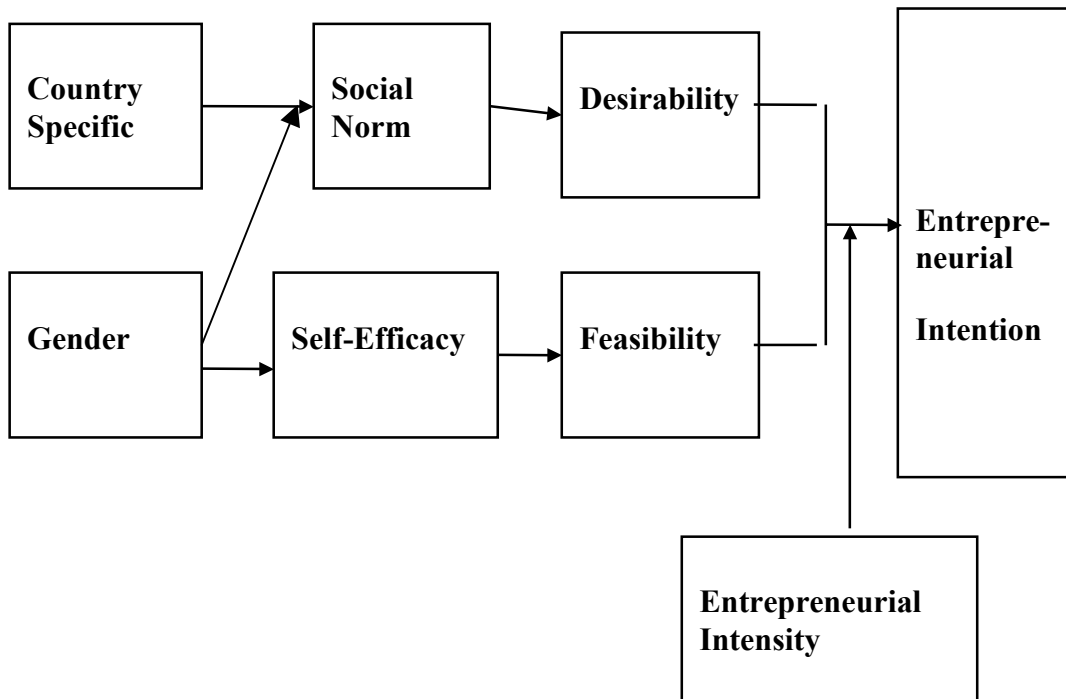


Figure 4. Extended Intentions Model (Krueger and Kickul, 2006)

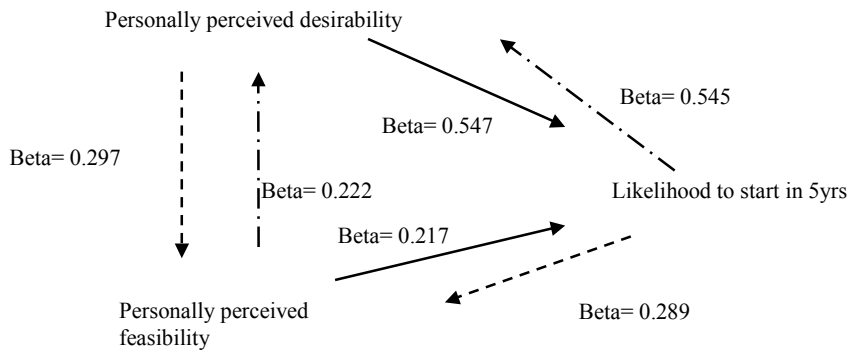


Figure 5. Evidence of Reciprocal Causation?

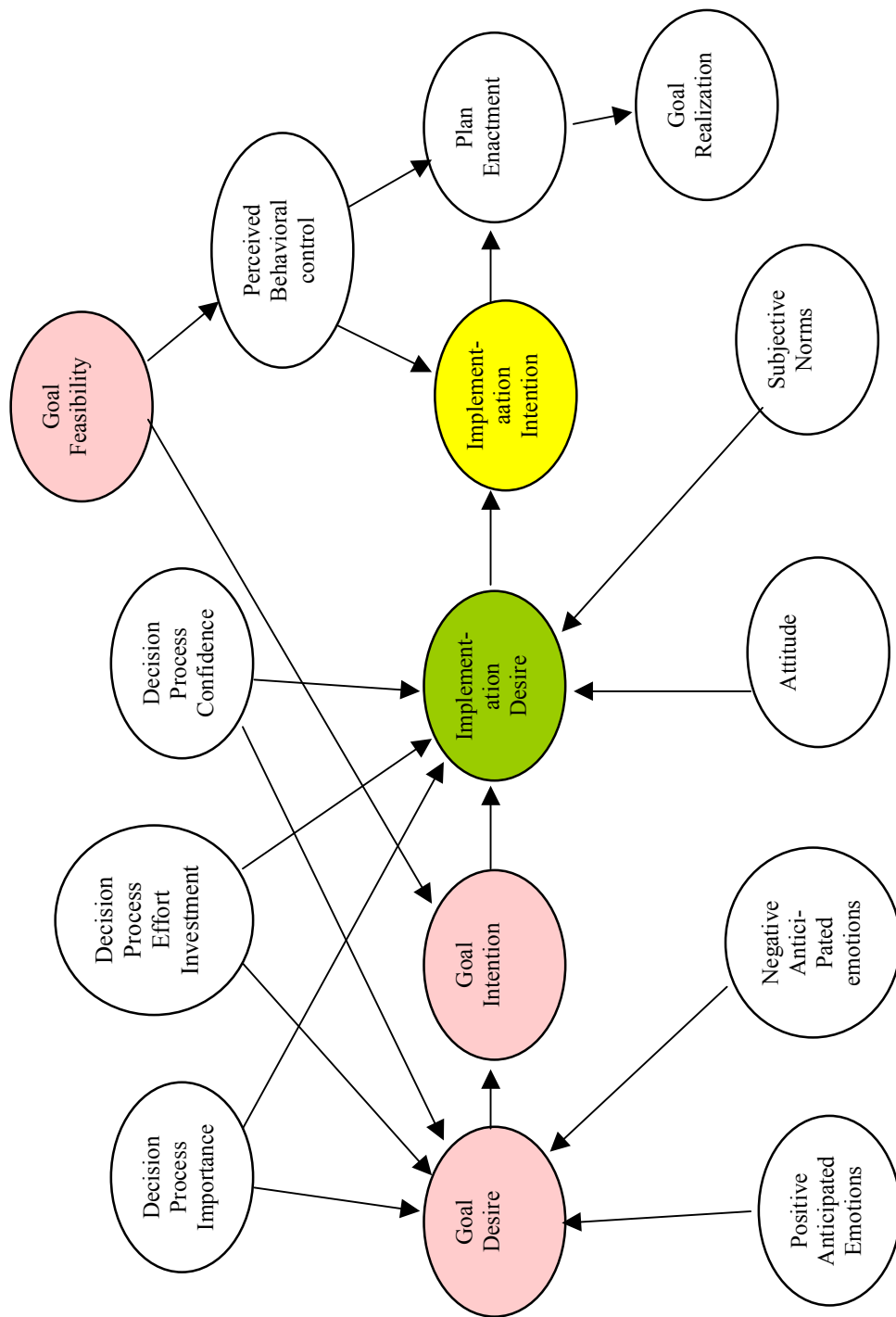


Figure 6. Effortful decision making and action (Bagozzi et al, 2003, p. 276)