

**‘BORN, NOT MADE’ AND OTHER BELIEFS  
ABOUT ENTREPRENEURIAL ABILITY**

DANIEL P. FORBES  
University of Minnesota, Carlson School of Management  
321 – 19<sup>th</sup> Ave. South, Suite 3-365, Minneapolis, MN 55455 USA  
email: daniel.p.forbes@gmail.com; phone: 612.625.2989

Accepted draft dated November 1, 2016. Published 2017 in the *Wiley Handbook of Entrepreneurship*.  
<https://doi.org/10.1002/9781118970812.ch13>

Citation for the published version:

Forbes, D. 2017. “‘Born, not made’ and other beliefs about entrepreneurial ability.” In G. Ahmetoglu, T. Chamorro-Premuzic, B. Klinger & T. Karcisky (Eds.), *The Wiley Handbook of Entrepreneurship*, pp. 273-291. Hoboken, NJ: Wiley & Sons Publishers.

© 2016. This manuscript version is made available under the CC-BY-NC-ND 4.0 license  
<http://creativecommons.org/licenses/by-nc-nd/4.0/>

This chapter was stimulated by conversations held at the 2009 Carey-Darden Entrepreneurship Scholars’ Retreat. I am grateful to Phil Phan for directing my attention to this topic and to Andrew Corbett, Dimo Dimov, Vlad Griskevicius, Lisa Leslie, Annaleena Parhankangas, Phil Phan, Saras Sarasvathy, Vaish Subramani, Eric Turkheimer, and Hao Zhao, among others, for their feedback on these ideas. The chapter has also benefited from the insights of seminar participants at the University of Western Ontario, Drexel University, and the University of Minnesota. Finally, I am grateful to the University of Virginia’s Batten Institute and the Richard M. Schulze Family Foundation for supporting the development of these ideas.

## **ABSTRACT**

### **‘BORN, NOT MADE’ AND OTHER BELIEFS ABOUT ENTREPRENEURIAL ABILITY**

The claim that “entrepreneurs are born, not made” captures the idea that entrepreneurial ability is largely determined by a person’s inborn characteristics. Despite longstanding scholarly interest in assessing the validity of this claim, *the belief* that entrepreneurial ability is inborn remains largely unexamined. This is unfortunate, because many people around the world hold this belief even though the belief itself is inconsistent with contemporary social science. In an effort to advance research in this area, I review recent social psychological research on lay theory and, in particular, on the concept of “essentialism,” the idea that members of large social groups possess an underlying set of immutable characteristics. Extending those ideas, I apply them to the case of occupational groups and introduce a construct to capture the belief that entrepreneurs possess an underlying essence that is fixed and inborn. I go on to explain how this belief is likely to affect important choices people make about the creation and management of new ventures. Taken together, these arguments expand scholarly conversations at the intersection of entrepreneurship and cognition by raising new questions about how and with what effects people think about entrepreneurial ability. (191 words)

## INTRODUCTION

The claim that “entrepreneurs are born, not made” is a colloquialism that captures the longstanding idea that entrepreneurial ability is a function of a person’s inborn characteristics. This idea has been advanced for years in popular discussions of entrepreneurship as well as in scholarly circles (Gartner, 1989; Shook, Priem & McGee, 2003), where it has motivated research on the entrepreneurial personality (e.g., Chell, 2008) and, more recently, on the genetic bases of entrepreneurial behavior (e.g., Shane, 2010). Despite longstanding scholarly interest in assessing the validity of this claim, *the belief* that entrepreneurial ability is inborn remains largely unexamined. This is unfortunate for several reasons.

First, people’s beliefs have important implications for their behavior, regardless of whether those beliefs are true (Hong, Levy & Chiu, 2001; Kruglanski et al., 2009). Scholars have paid considerable attention to the beliefs people hold about their own entrepreneurial abilities – i.e., their “entrepreneurial self-efficacy” (Hmieleski & Baron, 2008; Zhao, Seibert & Hills, 2006). But they have tended to ignore the more general beliefs people hold about the nature of entrepreneurial ability, even though general beliefs about ability have been shown to be highly consequential in other domains (Molden & Dweck, 2006). Second, notwithstanding the fact that people’s behaviors are influenced by their personalities and genetic profiles, the simpler and more strongly deterministic claim that “entrepreneurs are born” is inconsistent with contemporary social science (Dar-Nimrod & Heine, 2011; Turkheimer, 2000). Nevertheless, there is evidence that many people – including, as I observe below, roughly half of the adults in several large, economically prominent countries – do in fact believe that “entrepreneurs are born” (Amway, 2014). This evidence is consistent with broader evidence showing that many people hold simplistic and erroneous beliefs about the genetic bases of human behavior (Lanie et al., 2004; Richards, 1996). At the same time, the increasing availability of genetic testing is making it more common for people to be interested in – and more liable to misinterpret – their own genetic profiles (Gollust, Hull & Wilfond, 2002; Maron, 2014). Taken together, these factors make it important for scholars to consider more fully the implications of the frequently-touted and widely-held belief that “entrepreneurs are born”.

In this chapter, I encourage entrepreneurship scholars to expand their focus beyond the longstanding question of whether (or to what degree) entrepreneurs are born and to consider newer, less-explored questions, such as when, why and with what effects people actually believe this to be true. I begin by observing that significant numbers of people do in fact believe that entrepreneurs are born, and I show that some scholars have also endorsed this contention. I further explain, however, that the belief that entrepreneurs are “born, not made” is inconsistent with contemporary social science for a variety of reasons. I go on to review recent social psychological research on lay theory and, in particular, research on the concept of “essentialism,” the idea that members of large social groups possess an underlying set of immutable characteristics. Extending those ideas, I apply them to the case of occupational groups and introduce a construct to capture the belief that entrepreneurs possess an underlying essence that is fixed and inborn. I proceed to discuss several ways in which this belief is likely to affect important choices people make about the creation and management of new ventures.

Taken together, these arguments advance research at the intersection of entrepreneurship and cognition by expanding scholarly conversations about entrepreneurial ability beyond matters of self-belief to include consideration of how and with what effects people think about ability in general (e.g., Molden & Dweck, 2006). This, in turn, helps to deepen our understanding of how people’s beliefs shape their decisions about whether and how to exploit entrepreneurial opportunities (Ramoglou, 2011; Shepherd, McMullen, and Jennings, 2007).

### **“BORN, NOT MADE”: BELIEFS AND EVIDENCE**

The claim that entrepreneurs are born is commonly invoked in the popular press and even, to some extent, in academic literature. For example, *Forbes* magazine recently ran a cover story in which it profiled a set of entrepreneurs whose children were also engaged in entrepreneurial pursuits (Adams, 2011). The story highlighted similarities that suggested the parents had passed on the ‘business gene’ to their children. Other popular press articles have endorsed the claim even more explicitly (e.g., Gannett 2012; Maurya, 2015). Some scholars have also endorsed the claim, as Shane (2010) did in his book, *Born*

*entrepreneurs, born leaders* and as Fisher and Koch (2008) did in their book, *Born, not made: The entrepreneurial personality*.<sup>1</sup>

Beyond these examples, there is evidence the born-not-made belief is prevalent within and across societies. For example, the Amway Global Entrepreneurship Report (2014) asked over 43,000 people in 38 countries around the world whether they believed ‘entrepreneurs are born’ or, alternatively, whether entrepreneurial skills could be acquired. Thirty-seven percent of respondents worldwide indicated they believed entrepreneurs are born. The born-not-made belief was held by even larger percentages of the respondents in Great Britain (39%), Korea (42%), Brazil (46%), Slovakia (50%) and Japan (60%), among other countries.

Interest in the born-not-made claim is further reflected in some recent research studies which have documented evidence of a link between genetics and the entrepreneurial entry decision (Shane, 2010). For example, Nicolaou and colleagues (2008) analyzed the entrepreneurial entry behaviors of roughly 1,700 same-sex pairs of female twins from the UK using commonly-used measures of entrepreneurial entry. Through this study, they estimated the ‘heritability’ of entrepreneurial behavior to be ‘high even after [adjusting] for potential confounders such as gender, age, income, education, marital status race and immigrant status’ (p. 173).<sup>2</sup> Similarly, Zhang and colleagues (2009) studied the behaviors of roughly 2,000 same-sex pairs of male *and* female twins, again using common measures of entrepreneurial entry. They concluded that entrepreneurial behavior was heritable among females but not among males.

To the extent that popular media outlets cover the findings of studies like these, they are liable to “hype” them and thereby convey the simplistic impression that scientists have validated the born-not-

---

<sup>1</sup> Shane carefully qualifies this claim in some parts of the text, but he is less qualified in other parts and, clearly, in the title. Fisher and Koch make the claim much more strongly.

<sup>2</sup> In genetic studies, claims of this kind are commonly based on heritability coefficients. However, Turkheimer (2011) has criticized the use of these coefficients as measures of “how determined” a trait is, given that heritability depends on the population in which it is measured, a point which underscores the need for care in interpreting genetics studies.

made thesis (Bubela & Caulfield, 2004). In fact, however, making sense of such studies requires us to position their findings in a larger theoretical and empirical context.

First, behavioral genetics has shown that nearly all complex human behaviors are at least partially heritable. Indeed, the effect of genes is generally stronger than the effect of being raised in a certain family (Turkheimer, 2000). Thus, we should not be surprised to find that genes exert some influence on entrepreneurial behavior as well. However, the causal chains through which genes influence human behavior are generally very long such that individual differences with regard to complex human behaviors (like entrepreneurship) are likely to be a function of a great many genetic variations, each of which accounts for only a small percentage of behavioral variability (Chabris *et al.*, 2015). Moreover, a substantial portion of the remaining variation in human behavior is attributable to what behavioral geneticists call the ‘nonshared environment’, or the set of environmental influences that are unique to a single organism, as opposed to those that are common to siblings within a family (Dick, 2005; Turkheimer, 2000). In fact, behavior is shaped significantly by a complex interaction of genes and environment that includes the ‘self-determinative ability of humans to chart a course for their own lives, constrained but not determined by the genes, family and culture, and in response to the vagaries of environmental experience with which they are presented’ (Turkheimer, 2011; p. 826). Thus, there is no ‘gene for’ entrepreneurship, and accepting the claim that ‘entrepreneurs are born, not made’ would require us to embrace an oversimplified and exaggerated conception of how genes work.

Second, there is a meaningful difference between the characteristics that make someone more likely to become an entrepreneur and those that make someone more likely to perform well in that capacity. For example, consider Nicolaou and colleagues’ (2008) proposition that people with a genetic predisposition for ‘sensation-seeking’ are more likely to become entrepreneurs, owing to the capacity for entrepreneurial work to provide frequent exposure to ‘novel’ and ‘complex’ sensations. Even if we grant that this is true, it does not necessarily imply that people who are more predisposed to sensation-seeking are any more likely to succeed as entrepreneurs once they have made the entry decision. In fact, it is conceivable that, beyond a certain threshold level, higher levels of sensation-seeking might cause people

to perform *less well* as entrepreneurs, given that high levels of sensation-seeking have been associated with substance abuse and other high-risk behaviors (Zuckerman, 2006). The claim that entrepreneurs are born glosses over such complexities by conflating the determinants of entrepreneurial entry with the determinants of success, a practice that is hard to reconcile with the high rates of failure new ventures generally experience.

Third, decades of social psychological research on entrepreneurs has shown that entrepreneurs as a group are highly heterogeneous and do not, in fact, share a set of fixed psychological characteristics (Gartner, 1989; Mitchell *et al.*, 2002; Shook, Priem, and McGee, 2003). For example, Chell's (2008) exhaustive analysis of past scholarship in this vein yields an overall portrait of the 'entrepreneurial personality' which, despite scattered elements of thematic consistency, remains highly diffuse and empirically inconclusive – a finding that prompted her to conclude that the concept of the entrepreneurial personality is best understood as a 'social construction'. To observe this is not to dispute that specific personality traits may influence specific behaviors relevant to entrepreneurship, as some scholars have concluded (e.g., Rauch and Frese, 2007; Zhao and Seibert, 2006), or that certain cognitive processes may facilitate the exploration or exploitation of opportunities. However, it is to say that there exists no scientifically-grounded set of psychological characteristics that reliably distinguish 'born entrepreneurs' from non-entrepreneurs.

Finally, research in entrepreneurship suggests that people who persist in entrepreneurial activities over time can develop knowledge that enhances their ability (e.g., Baron and Ensley, 2006; Parker, 2013; Sarasvathy, 2008). Research further indicates that entrepreneurial ability encompasses multiple components, including technical, social and cognitive skills (Markman, 2007; Mitchell *et al.*, 2000), the significance of which may vary across environmental contexts (e.g., Aldrich & Martinez, 2001; Baron and Markman, 2003). Although the ability to acquire any given skill may vary across individuals, there exists a wide range of social settings within which innate talent has been shown to be less crucial to task performance than deliberate practice, which triggers improvements over time in memory, intuition and other cognitive processes that further skill development and task performance (Baron and Henry, 2010).

To the extent these findings indicate that the skills associated with entrepreneurial ability are diverse, learnable and context-specific, they further contradict the idea that entrepreneurs are born.

In summary, notwithstanding the real influence that genes exert on entrepreneurial (or any other) behavior, the claim that ‘entrepreneurs are born, not made’ is a significant exaggeration, and belief in the claim is inconsistent with contemporary social science. Nevertheless, as we have seen, the born-not-made thesis is often publicly advanced by influential people and sources, and it is widely held among members of the general population in a variety of cultural and institutional contexts. At a minimum, this state of affairs is noteworthy as an example of a disconnect between popular belief and research-based knowledge about entrepreneurship (Davidsson, 2002) – a disconnect that would seem to call for a “knowledge transfer” effort of the kind that scholars interested in “evidence-based management” have advocated in recent years (e.g., Rousseau & McCarthy, 2007). But this disconnect is all the more significant in light of recent scientific advances that have made it easier for people to access their own (and potentially others’) genetic profiles (Maron, 2014). Given that such tests are already widely available and are increasingly marketed with reference to the information they can provide relevant to health, disease and reproduction (Gollust et al., 2002), it is reasonable to expect such tests to be increasingly sought out for work- and career-related purposes as well. For all of these reasons, there is a need for scholars to understand more fully the belief that entrepreneurs are born and to investigate its implications for entrepreneurial behavior. Tools appropriate to these tasks can be found in recent social psychological research on how people think about social groups.

## **UNDERSTANDING HOW PEOPLE THINK ABOUT ENTREPRENEURS**

Research relevant to understanding how people think about entrepreneurs as a social group can be found within certain streams of research on ‘lay theory’. A lay theory is a knowledge structure possessed and used by lay people, as opposed to scientists (Furnham, 1988; Heath, 1999; Kruglanski *et al.*, 2009). Among the earliest lay theories to be explored were ‘implicit’ theories of personality and related psychological concepts (Furnham, 1988). More recently, the study of lay theory has examined the ideas



people invoke in making sense of other aspects of the world, including physics and biology (e.g., Baron-Cohen, 1997; Jayaratne *et al.*, 2009).

An important set of lay theories involves the beliefs people hold about the properties of social groups. In general, people tend to assign social groups to one of four main types: intimacy groups (e.g., groups of friends); social categories (e.g., gender categories such as men and women); task groups (e.g., project teams) and loose associations (e.g., people in an elevator) (Lickel, Hamilton, and Sherman, 2001). The type to which a specific group of people is assigned depends on that group's characteristics. Large groups of people that exist for long durations, for example, such as groups of people categorized with reference to their gender or occupation, are treated as social categories (Lickel *et al.*, 2001). Clearly, however, social categories are highly heterogeneous, encompassing groups whose boundaries may be drawn with reference to a wide range of criteria. Most research attention has been devoted to how lay people make sense of large social categories, such as those defined with reference to race, ethnicity, religion or gender (Levy, Chiu, and Hong, 2006). But by drawing on what we know about lay theorizing in connection with such groups, we can explore the way people think about occupational groups as well. In doing so, we can characterize more fully the belief that entrepreneurs are born and not made.

### **Essentialist lay beliefs**

A key issue investigated in connection with lay theory is the extent to which people hold 'essentialist' beliefs about social categories, or the extent to which they believe the people in these categories possess an underlying essence that is fixed (i.e., stable over time) and inductively potent, meaning it can serve as a strong basis for inferring other non-obvious properties (Rothbart and Taylor, 1992). For example, there is considerable evidence that lay beliefs about gender categories are highly essentialized (Haslam, Rothschild, and Ernst, 2000). In other words, many lay people believe the categories 'men' and 'women' each possess an underlying essence that is shared by the members of those categories. However, lay people vary with regard to the strength of their essentialist beliefs; in other words, some people hold these beliefs more strongly than do others. In addition, the prevalence and

strength of essentialist lay beliefs varies significantly across social categories. For example, essentialist beliefs about gender categories are more widespread than are essentialist beliefs about ethnic groups, social classes and personality types, although there is evidence that many lay people hold essentialist beliefs about all of these categories (Haslam and Whelan, 2008; Levy *et al.*, 2006).

Essentialist beliefs are important, because research has shown that these beliefs affect how people make sense of their own behavior and that of others. For example, research has shown that when people hold essentialist beliefs about a social group, they are likely to endorse group stereotypes more readily, to exaggerate the homogeneity of the group and to attribute people's behavior – their own and others' – to their 'nature' as members of the group (Yzerbyt and Rocher, 2002; Demoulin, Leyens, and Yzerbyt, 2006). Thus, essentialist beliefs are related to stereotypes of social groups, but they differ from those beliefs in that essentialist beliefs do not entail any specific beliefs about the attributes or behaviors shared by members of a social group. Rather, they simply capture the belief that members of a group possess an underlying essence that is fixed and inductively potent.

The belief that members of a social group possess a fixed underlying essence is sometimes linked with lay beliefs about genes and human behavior (Nelkin and Lindee, 1995). Because lay theories of human biology are highly varied in their validity and sophistication, many lay people believe that genes play a much simpler and more direct role in shaping human behavior than they actually do (Lanie *et al.*, 2004; Richards and Ponder, 1996). Researchers have gauged the prevalence and strength of such beliefs with instruments like the 'belief in genetic determinism' scale, which asks people to register the extent to which they agree with statements such as, 'The fate of each person lies in his or her genes' (Keller, 2005). Through this scale and similar ones, researchers have found that people who believe genes exert a simple and strong relationship on human behavior are also more likely to ascribe people's behavior to their membership in a particular social group, especially when they perceive that the group has a shared genetic foundation (Dar-Nimrod and Heine, 2011). Building on these findings, psychologists have introduced the idea of 'genetic essentialism', a type of essentialism characterized by 'the tendency to infer a person's

characteristics and behaviors from his or her perceived genetic makeup' (Dar-Nimrod and Heine, 2011; p. 801).

### **Genetic essentialist lay beliefs about entrepreneurs**

Past research on essentialist beliefs has tended to focus on how people think about large social categories, such as those defined with reference to race or ethnicity. However, people also hold beliefs about the members of occupational categories (e.g., Spencer-Rodgers, Hamilton, and Sherman, 2007). For example, research has shown that many people believe lawyers are generally 'dishonest' and 'arrogant' (Rhode, 1998), and a recent article in a major medical journal examined several common public perceptions of physicians (Jain and Cassell, 2010). Entrepreneurs are another occupational category about which people hold certain beliefs, and these beliefs sometimes represent a form of genetic essentialism.

Fisher and Koch (2008) provide a vivid illustration of these beliefs in their book, *Born, not made*. They write:

The confident driven individuals who become entrepreneurs typically have different genetic endowments than those who are not entrepreneurial ... Most are hardwired genetically to react differently than other individuals to external stimuli that portray risk, danger, excitement and change. (pp. 2-3)

This statement conveys key elements of genetic essentialism in that it defines entrepreneurs as a group of people whose occupational choice is attributable to an underlying psychological essence that is fixed and genetically-based. I discuss these elements in turn.

The belief in a fixed entrepreneurial essence entails a belief that entrepreneurs as a group possess a set of underlying characteristics that are stable. This contrasts with the belief that a group's characteristics are dynamic, meaning they are malleable and can be changed over time (Wood and Bandura, 1989). People often disagree about whether particular characteristics are static or dynamic, and they may hold such beliefs with reference to a variety of characteristics (Dweck, 2000). Although lay beliefs about entrepreneurs often feature beliefs about an entrepreneurial essence, the characteristics to which that essence is attributable are not always clearly specified. Sometimes the characteristics are

specified, as in the quotations above referencing confidence and risk-taking. But people can also believe that a social category has an essence without believing that they fully understand the essence. In these cases, essentialism functions as a kind of ‘placeholder’ in that an unspecified essence stands in for belief in characteristics that are believed to exist but considered difficult to discern (Gelman, 2003). Whether the characteristics are specified or not, belief in a fixed entrepreneurial essence reflects the belief that the characteristics represented by the essence are ones that cannot be cultivated, learned or otherwise acquired over time; rather, people possess those characteristics in certain quantities that remain stable over time (Dweck and Leggett, 1988).

The belief that a person’s characteristics are rooted in his/her genes represents the second key element of genetic essentialism. Broadly speaking, alternative sources of people’s characteristics include people’s prior choices and their social environments as well as their genes (Jayaratne *et al.*, 2009). People often disagree about which sources are responsible for particular human characteristics. But when people also believe that particular characteristics are stable, the set of plausible alternative sources is generally confined to sources exerting a distant or long-term effect on the person, such as genes or parenting, as opposed to sources based on recent personal choice (e.g., Phelan, 2002). Although much human behavior has some genetic basis, the belief I refer to here is belief in a relatively simple, direct process of translation, or a ‘strong genetic explanation’ of the kind reflected in the above quotations, which quickly invoke ‘DNA’ as a primary or even singular determinant of entrepreneurs’ essential characteristics.

I summarize below the key elements of genetic essentialism as it applies to entrepreneurs.

*Definition: People who hold genetic essentialist beliefs about entrepreneurs believe that entrepreneurs possess an underlying essence defined by one or more personal characteristics. They further believe that the extent to which any one person possesses the relevant characteristic(s) is: (a) fixed; and (b) strongly determined by his/her genes.*

### **Born-not-made and general beliefs about entrepreneurial ability**

A corollary to the belief that entrepreneurs are born is the belief that entrepreneurial ability is itself a fixed attribute, as opposed to a malleable one. In social scientific theories, there is generally (but not always) a clear distinction drawn between a person's propensity to join an occupational category and the person's propensity to succeed in that category. However, people who subscribe to the born-not-made thesis are likely to conflate the set of fixed characteristics that they associate with entrepreneurial entry with a similar set of fixed characteristics that they believe to be associated with entrepreneurial performance.

Research on intergroup perception supports this expectation: For example, work by Levy and colleagues (2001) showed that people who subscribe to a 'fixed' theory of human nature were more likely to exaggerate the homogeneity of social groups and more likely to exaggerate the differences between groups. Where occupational groups are concerned, this perspective is likely to have the effect of downplaying the very existence of performance differences among members of the group and of highlighting instead the shared attributes of occupational group members. To the extent that the shared attributes of entrepreneurs imply behaviors that may affect performance, it becomes easier for people to believe that those who are 'more entrepreneurial' are also more likely to succeed as entrepreneurs. Consider, for example, the following remarks offered by the director of a regional business development program in the United States:

Entrepreneurs have the vision to see what is possible. They have the creativity to develop new approaches to old problems and to muster the right resources in the right combination to bring their dreams to fruition. And, they have the self-assuredness to see the vision become reality, often in spite of seemingly insurmountable obstacles. (Paulsell, 2008)

This person is surely professionally acquainted with the reality that some entrepreneurs outperform others and that some fail outright. What is noteworthy about the quote, however, is the way it downplays that reality as well as its implication that those who manage to overcome the obstacles of entrepreneurship will be those who possess more of the essential characteristics of entrepreneurs. In light of this tendency to equate entrepreneurs' underlying essence with their performative capacity, people who

subscribe to the born-not-made thesis are likely to conclude that entrepreneurial ability, like the essence itself, is a fixed attribute. Such a belief would be reflected in agreement with statements such as, ‘Each person has a certain amount of entrepreneurial ability, and he/she can’t really do much to change it.’

*Proposition 1: People who hold genetic essentialist beliefs about entrepreneurs also believe that a person’s entrepreneurial ability is a fixed attribute.*

## **IMPLICATIONS OF BELIEF IN BORN-NOT-MADE**

In the sections that follow, I explore ways in which the beliefs described above may affect the behavior of two groups of people: (1) potential entrepreneurs, and (2) people tasked with evaluating others’ entrepreneurial abilities.

### **Implications for the judgments people make about their own entrepreneurial abilities**

An important implication of belief in the born-not-made thesis is its potential to discourage entrepreneurial activity among potential entrepreneurs. This is likely to occur to the extent that belief in born-not-made engenders in potential entrepreneurs a low sense of entrepreneurial self-efficacy (ESE).

The Global Entrepreneurship Monitor (GEM) defines potential entrepreneurs to be people who have identified an opportunity and believe they have the skills to exploit it (GEM, 2011). Even under this relatively restrictive definition, GEM studies indicate that 30 to 55% of the adult population of many countries qualify as potential entrepreneurs. However, scholars have recognized that the ‘supply’ of potential entrepreneurs in a society is not immutable but, rather, is subject to larger societal influences over time (e.g., Busenitz, Gomez, and Spencer, 2000). In a broader sense, therefore, the set of potential entrepreneurs may be understood to encompass more people, regardless of whether they already believe they have the skills to exploit a particular opportunity (Shook *et al.*, 2003). Consistent with this view, I define potential entrepreneurs as people who have discovered an opportunity and are considering exploiting it. In McMullen and Shepherd’s (2006) framework, this includes people who have identified a

‘third-person’ opportunity but have not yet decided whether to pursue the opportunity themselves. This definition is broader than the GEM definition in that it includes people who possess a range of beliefs about their own entrepreneurial abilities – in other words people with varying levels of ESE.<sup>3</sup>

ESE is a construct that captures the degree to which people believe they have the ability to perform the tasks associated with launching a new business (Chen, Greene, and Crick, 1998; Hmieleski and Baron, 2008). Research has shown that people with higher levels of ESE are more likely to formulate entrepreneurial intentions (e.g., Wilson, Kickul, and Marlino, 2007; Zhao, Seibert, and Hills, 2005) and, ultimately, to act on them (e.g., Arenius and Minniti, 2005; Koellinger, Minniti, and Schade, 2007). More broadly, Levie and Autio (2008) argued that societies in which people possess higher levels of ESE will realize higher rates of new venture creation. Past research on the sources of ESE has focused on ways in which ESE is shaped by prior experiences, especially entrepreneurship-related educational experiences and prior entrepreneurial experiences (e.g., Ucbasaran *et al.*, 2008; Wilson *et al.*, 2007; Zhao *et al.*, 2005). But many potential entrepreneurs have not yet chosen to pursue either type of experience (Leibenstein, 1968). Moreover, beliefs are not entirely a function of experience; rather, they are likely to operate as part of a larger set of related beliefs (Bandura, 1993; Molden and Dweck, 2006). Born-not-made is an example of a general, topically-relevant belief that is likely to exert an important influence on ESE.

One reason born-not-made is relevant to ESE is that “controllability” plays an important role in people’s efficacy judgments (Bandura, 1997). In general, people possess lower levels of self-efficacy regarding tasks when they believe more strongly that the determinants of task performance are uncontrollable (Gist & Mitchell, 1992; Wood & Bandura, 1989). Consider, for example, that in many contemporary societies, it is relatively easy for people to encounter media accounts of highly successful entrepreneurs. Although it is possible for people to attribute such instances of success entirely to luck, people who believe in the born-not-made thesis will generally assign at least some portion of entrepreneurial performance to ability, and to the extent they do they are likely to infer that there exists a

---

<sup>3</sup> Strictly speaking, the population of potential entrepreneurs may include people who have previously started other ventures. However, given that many potential entrepreneurs will also be novice entrepreneurs, I focus here on sources of ESE other than prior entrepreneurial experience.

wide range of entrepreneurial abilities. However, their belief in the fixed nature of these abilities will also lead them to infer that ability-based determinants of entrepreneurial performance are uncontrollable, and this is likely to result in lower levels of ESE.

In addition, potential entrepreneurs' ESE assessments are likely to be shaped by social influences, including verbal persuasion (Bandura, 1997). Key sources of verbal persuasion that may affect a person's efficacy beliefs include appraisals of ability expressed by experienced others (Crundall and Foddy, 1981), which in the case of entrepreneurship may include experienced entrepreneurs or other businesspeople, investors or teachers. Potential entrepreneurs often experience feedback, including verbal feedback, from these and other sources about the opportunities they are considering (Gartner and Carter, 2003). Such feedback may include feedback on the strengths and weaknesses of a given opportunity, but it may also include explicit or implicit appraisals of a person's ability, and in both cases much of the feedback is negative (Brockner, Higgins & Low, 2004). This is important, because verbal persuasion is generally more powerful as a source of *discouragement* than as a means of producing enduringly high efficacy beliefs: Although people persuaded to adopt high efficacy beliefs will ultimately find those beliefs tested against other sources of information, people persuaded to adopt low beliefs can find that those beliefs 'create their own behavioral validation' by 'constricting choice of activities, undermining motivation and discouraging explorations' (Bandura, 1997: p. 104). Frese (2007) observed that negative feedback can provide entrepreneurs with motivation as well as information from which to learn. However, whether a potential entrepreneur processes negative feedback by drawing inferences that lead to persistence and learning or, alternatively, by drawing inferences that lead to discouragement is likely to be influenced by the more general beliefs he or she holds about the nature of entrepreneurial ability.

Potential entrepreneurs who believe entrepreneurs are born are likely to look to verbal feedback for clues that help 'reveal' their own underlying entrepreneurial ability (Dweck, 2000). Accordingly, they are more likely to read negative feedback as a signal that they 'don't have what it takes' to be an entrepreneur. This, in turn, is likely to amplify the negative effects of negative feedback on ESE. On the other hand, potential entrepreneurs who do not subscribe to the born-not-made thesis are likely to



interpret verbal feedback more broadly – for example, as providing information about the opportunity itself or about specific alternative ways it might be exploited. To the extent they do encounter explicit, negative appraisals of their ability, they are more likely to conclude that the shortcomings can be remedied through additional effort or experience. This expectation is consistent with recent research in other settings, which has shown that belief in an incremental theory of ability (i.e., that abilities are malleable) mitigates the discouraging effects of negative information, including stereotypically negative portrayals of ability (Molden and Dweck, 2006; Pollack *et al.*, 2012).

*Proposition 2: Potential entrepreneurs who hold genetic essentialist beliefs about entrepreneurs will possess lower levels of ESE.*

### **Implications for the judgments people make about others' entrepreneurial abilities**

Another way genetic essentialist beliefs may affect entrepreneurial behavior is by influencing how people make judgments about others' abilities to perform as entrepreneurs. I consider below two common contexts in which people make such judgments: 1) financing decisions and 2) the selection of entrepreneurial team members.

Entrepreneurial financing decisions are situations in which a person in control of financial resources (a 'funder', to apply a generic label) is tasked with deciding which person(s) and/or firms represent the best investment opportunities among a set of available alternatives (DeClercq *et al.*, 2007). The person in that role may be a venture capitalist or an angel investor deciding whether to invest in a startup or a competition judge charged with awarding prize money. Because past research has shown that many funders consider the abilities of the entrepreneur(s) themselves to be of high importance (Huang & Pearce, 2015; Zott & Huy, 2007), financing decisions are likely to be significantly influenced by the beliefs funders hold about the nature of entrepreneurial ability.

When funders believe that entrepreneurs possess an underlying essence that is fixed and inborn, they are likely to direct their attention to information that they believe will help them determine the extent

to which individual funding candidates possess that underlying essence. At the extreme, this could prompt funders to request detailed genetic information on specific individuals. But even if such behavior is inhibited by legal or ethical barriers, funders can try to discern a candidate's inborn essence on the basis of more readily available data, such as personality traits or the success of the candidate's prior entrepreneurial experiences. Such data often factor into funding decisions as a matter of course (Riquelme & Watson, 2002), but funders with genetic essentialist beliefs are likely to overweight those factors to the extent they interpret them as signals of an underlying inborn capacity. Relatedly, owing to the corollary belief that entrepreneurial ability is fixed, genetic essentialist beliefs are likely to prompt funders to assign diminished or negative values to career experiences that could represent significant episodes of learning and development, such as prior entrepreneurial failures.

Moreover, funders may look to even more simplistic cues as a basis for inferring whether an individual is a "born entrepreneur". For example, Brooks and colleagues (2014) found that investors were more likely to fund ventures when those ventures were pitched by males, as opposed to females, even when the content of the pitch was identical. That study did not determine why investors exhibited this preference; however, as Pollack and colleagues (2012) have observed, "[h]istorically, descriptions of entrepreneurs' activities and the success of new organizations have been unequivocally masculine" (p. 288). Accordingly, it is not difficult to imagine that investors who believe entrepreneurs are born could regard gender or other forms of visible difference to be suitable proxies for inferring whether individuals possess an entrepreneurial essence. Past research on essentialism and social judgment in other contexts is consistent with this expectation insofar as people with genetic essentialist beliefs have been shown to form faster judgments about others (Bastian and Haslam, 2007), to invoke group stereotypes more readily, and to subsequently pay less attention to data inconsistent with those stereotypes (Levy *et al.*, 2001; Yzerbyt and Rocher, 2002).

Similar dynamics are likely to unfold when a person is tasked with deciding which person(s) represent the most compelling candidates for recruitment onto an entrepreneurial team. The person making this decision is often an entrepreneur seeking business partners, although an investor, board

member or other external advisor may also influence who is chosen (Klotz *et al.*, 2014). In both cases, the task calls for evaluation of a person's abilities, including those abilities relevant to the launch and management of a new venture. As with financing decisions, team member selection decisions may also be shaped by cognitive bias (Parker, 2009). Genetic essentialist beliefs are likely to trigger biased selection decisions, either by prompting selectors to consider candidates' genetic profiles directly or to misjudge the salience of other data, such as those described above, based on its perceived capacity to proxy for a person's inborn abilities. For example, data pertaining to candidates' subject-specific knowledge and skills or data pertaining to candidates' relationships with other people within or beyond the entrepreneurial team may be more likely to be underweighted or overlooked by selectors with genetic essentialist beliefs insofar as those data do not clearly correspond to a person's possession of an entrepreneurial essence, even though those data may in fact be highly relevant to a person's ability to perform well as an entrepreneurial team member (Beckman and Burton, 2008; Owens, Mannix, and Neale, 1998).

I have focused here on the initial selection decisions associated with financing and entrepreneurial team formation, but it is also possible for genetic essentialist beliefs to affect the ongoing evaluation of people in entrepreneurial roles. For example, people who join the board of a new venture after the initial funding and team formation decisions can find themselves monitoring and evaluating the performance of individuals they did not select. In such cases, as in many governance contexts, board members are tasked with disentangling the various internal and external drivers of firm performance and making appropriate attributions of responsibility (Mantere *et al.*, 2013; Walsh and Seward, 1990). Evaluators with genetic essentialist beliefs about entrepreneurs are likely to draw poorer inferences about the causes of performance insofar as they will be prompted to overweight internal determinants (positively or negatively) or to scrutinize performance data for evidence of whether specific individuals possess an inborn entrepreneurial essence.

In summary, genetic essentialist beliefs are likely to adversely affect the quality of the decision processes through which people select and evaluate others in connection with entrepreneurial roles. In

particular, people who hold such beliefs are more likely to overweight their perceptions of individuals' personality traits, to underweight the value of past experience and training as sources of entrepreneurial ability, and to formulate interpretations of performance that are more skewed by attributional bias.

*Proposition 3: When tasked with evaluating people's entrepreneurial abilities, people who hold genetic essentialist beliefs about entrepreneurs will render lower-quality evaluations relative to those who do not hold such beliefs.*

## **DISCUSSION**

In this chapter I have called attention to a specific, widely-held belief which, despite its familiarity, remains theoretically and empirically under-examined in the entrepreneurship literature: the belief that entrepreneurs are born and not made. Drawing on recent social psychological research on lay theory, I have introduced a construct that captures this belief and explained how the belief is likely to cause people to systematically over- or under-estimate the entrepreneurial abilities that they and others possess.

Taken together, these arguments advance research at the intersection of entrepreneurship and cognition by expanding scholarly conversations about entrepreneurial ability beyond matters of self-belief (i.e., as reflected in the study of entrepreneurial self-efficacy, or ESE) to include consideration of how and with what effects people think about ability in general. This helps link entrepreneurship research with the large body of social psychology research that has underscored the significance of general ability-related beliefs as determinants of human behavior (e.g., Molden and Dweck, 2006; Wood and Bandura, 1989) – a body of work that entrepreneurship scholars have largely ignored to date. At the same time, it complements the recent efforts of other entrepreneurship scholars to deepen our understanding of how people's beliefs shape their decisions about whether and how to exploit entrepreneurial opportunities (e.g., Felin & Zenger, 2009; Ramoglou, 2011; Shepherd, McMullen, and Jennings, 2007). More broadly, by showing how entrepreneurial beliefs relate to larger systems of belief that operate within societies, this

article responds to recent calls for research that clarifies how entrepreneurial cognition is shaped by the social systems and processes in which it is situated (Gregoire, Corbett, and McMullen, 2008; Mitchell et al., 2000).

Second, the arguments presented here help expand research on entrepreneurship and cognition beyond its traditional focus on existing entrepreneurs and towards the larger and less-understood population of potential entrepreneurs. In doing so, these arguments respond to Sarasvathy's (2004) call for scholars to pay more attention to the subset of people in a society 'who want to become entrepreneurs but do not', owing to one or more barriers that may exist (p. 707) as well as to Shepherd and colleagues' (2007) call for research that helps clarify when and why individuals who identify a 'third person opportunity' refrain from exploiting it themselves. In particular, by showing how genetic essentialist beliefs may inhibit the exploitation of opportunities recognized by potential entrepreneurs, they help to show how such beliefs may exert a "drag" on the societies in which they are widely held.

These contributions carry several implications for future research and practice. First, there is a need for empirical research that tests these propositions and related ones, using data on the ability-related beliefs and perceptions of people who are not (yet) actively engaged in entrepreneurship. Such efforts could be linked to ongoing data collection efforts that gauge the general norms and beliefs people hold about entrepreneurship in countries around the world (e.g., the GEM). Relatedly, future studies could examine variations in the prevalence of the born-not-made thesis within and across societies (e.g., across cultures or education levels). Such studies could help elaborate some of the specific beliefs and inferences through which societal and institutional factors shape cross-national variations in entrepreneurial activity (Busenitz *et al.*, 2000; Levie and Autio, 2008). It is common for entrepreneurship scholars to refer in broad terms to the existence and significance of these cognitive mechanisms, but there is a need for work that elaborates more fully what the relevant beliefs are and how they shape entrepreneurial activity (Busenitz *et al.*, 2000; Gregoire *et al.*, 2008). Finally, future research could shed light on linkages between the psychology of entrepreneurship and socioeconomic research on human capital in entrepreneurship (e.g., Aldrich and Yang, 2012; Lazear, 2004), for example by documenting differences

in how people conceive of entrepreneurial ability and by assessing the validity of alternative conceptions of ability.

Methodologically, too, there is a need for scholars to adapt and refine the empirical research tools developed in psychological studies of essentialism and ability-related beliefs for application in entrepreneurship. Although most past research on lay beliefs has focused on large social categories, such as those defined with reference to gender and ethnicity, future scholars could build upon the survey instruments and experimental methods developed in the study of those categories to test predictions about what lay people believe about entrepreneurs and how those beliefs influence entrepreneurial behavior as well as business behavior more generally. Studies by Heath (1999) and Priem and Rosenstein (2000) provide examples of experimental studies that test lay beliefs related to management.

Finally, a practical implication of the ideas developed in this article is that they should prompt people who work closely with potential and existing entrepreneurs to surface and engage directly with the beliefs lay people hold about the sources of entrepreneurial ability. Clearly, individuals and societies stand to gain in many ways from the impending growth in scientific knowledge about how genetics shapes human behavior as well as from the increasingly widespread availability of genetic tests. But such advances also increase the risk that people will formulate ability-related beliefs that are skewed by misinterpretations of genetic information. Thus, there exists both a need and an opportunity for teachers, consultants and journalists, among others, to improve the accuracy of lay beliefs in this area and, in doing so, to improve the quality of the decisions people make about whether and how to engage in entrepreneurial activity.

## REFERENCES

- Adams S. 2011. 'Entrepreneurs: The 'business' gene'. *Forbes*, May 23; cover story.
- Aldrich, H. & Martinez, M.A. 2001. Many are called but few are chosen. *Entrepreneurship Theory & Practice*, 25: 41-56.
- Aldrich H, Ruef M. 2006. *Organizations evolving*. (2<sup>nd</sup> ed.) London: Sage.
- Aldrich H, Yang T. 2012. Lost in translation: Cultural codes are not blueprints. *Strategic Entrepreneurship Journal*, 6: 1-17.
- Amway. 2014. *Global Entrepreneurship Report*. <http://www.amwayentrepreneurshipreport.com>. (accessed October 1, 2015)
- Arenius P, Minniti, M. 2005. Perceptual variables and nascent entrepreneurship. *Small Business Economics*, 24: 233-247.
- Bandura A. 1993. Perceived self-efficacy in cognitive development and functioning. *Educational Psychologist*, 28: 117-148.
- Bandura A. 1997. *Self-efficacy: The exercise of control*. New York: Freeman.
- Baron-Cohen S. 1997. 'Are children with autism superior at folk physics?' In Wellman H, Inagaki K (Eds.), *The emergence of core domains of thought: Children's reasoning about physical, psychological and biological phenomena*, pp. 45-54. San Francisco: Jossey-Bass.
- Baron R. 1998. Cognitive mechanisms in entrepreneurship: When and why entrepreneurs think differently from other people. *Journal of Business Venturing*, 13: 275-294.
- Baron R, Ensley M. 2006. Opportunity recognition as the detection of meaningful patterns: Evidence from comparisons of novice and experienced entrepreneurs. *Management Science*, 52: 1331-1344.
- Baron R, Henry R. 2010. How entrepreneurs acquire the capacity to excel: Insights from research on expert performance. *Strategic Entrepreneurship Journal*, 4: 49-65.
- Baron R, Markman G. 2003. Beyond social capital: The role of entrepreneurs' social competence in their financial success. *Journal of Business Venturing*, 18: 41-60.
- Bastian B, Haslam N. 2006. Psychological essentialism and stereotype endorsement. *Journal of Experimental Social Psychology*, 42: 228-235.
- Bastian B, Haslam N. 2007. Psychological essentialism and attention allocation. *Journal of Social Psychology*, 147: 531-541.
- Beckman C, Burton, D. 2008. Founding the future: Path dependence in the evolution of top management teams from founding to IPO. *Organization Science*, 19: 3-24.
- Brockner, J., Higgins, E. & Low, M. 2004. Regulatory focus theory and the entrepreneurial process. *Journal of Business Venturing*, 19: 203-220.

- Brooks, A.W., Huang, L., Kearney, S.W. & Murray, F. 2014. Investors prefer entrepreneurial ventures pitched by attractive men. *Proceedings of the National Academy of Sciences*, 111: 4427-4431.
- Bubela, T. & Caulfield, T. 2004. Do the print media 'hype' genetics research? A comparison of newspaper stories and peer-reviewed research papers. *Canadian Medical Association Journal*, 170: 1399-1407.
- Busenitz L, Gomez C, Spencer J. 2000. Country institutional profiles: Unlocking entrepreneurial phenomena. *Academy of Management Journal*, 43: 994-1003.
- Cervone D, Palmer B. 1990. Anchoring biases and the perseverance of self-efficacy beliefs. *Cognitive Therapy and Research*, 14: 401-416.
- Chabris CF, Lee JJ, Cesarini D, Benjamin DJ, Laibson DI. 2015. The fourth law of behavior genetics. *Current Directions in Psychological Science*, 24(4): 304-312.
- Chell E. 2008. *The entrepreneurial personality: A social construction*. (2<sup>nd</sup> ed.) London: Routledge.
- Chen C, Greene P, Crick A. 1998. Does entrepreneurial self-efficacy distinguish entrepreneurs from managers? *Journal of Business Venturing*, 13: 295-316.
- Crundall I, Foddy M. 1981. Vicarious exposure to a task as a basis of evaluative competence. *Social Psychology Quarterly*, 44: 331-338.
- Dar-Nimrod I, Heine S. 2011. Genetic essentialism: On the deceptive determinism of DNA. *Psychological bulletin*, 137: 800-818.
- Davidsson, P. 2002. What entrepreneurship research can do for business policy practice. *International Journal of Entrepreneurship Education*, 1: 5-24.
- DeClercq D, Fried V, Lehtonen O, Sapienza H. 2007. An entrepreneur's guide to the venture capital galaxy. *Academy of Management Perspectives*, 20: 90-112.
- Demoulin S, Leyens J, Yzerbyt, V. 2006. Lay theories of essentialism. *Group Processes and Intergroup Relations*, 9: 25-42.
- Dick D. 2005. 'Shared environment.' In Everitt B, Howell D (eds.), *Encyclopedia of Statistics in Behavioral Science*, Vol. 4: 1828-1830. Chichester, UK: John Wiley and Sons.
- Dweck C. 2000. *Self-theories: Their role in motivation, personality and development*. Philadelphia: Taylor and Francis.
- Dweck C. and Leggett E. 1988. A social cognitive approach to motivation and personality. *Psychological Review*, 95: 256-273.
- Felin T, Zenger T. 2009. Entrepreneurs as theorists: On the origins of collective beliefs and novel strategies. *Strategic Entrepreneurship Journal*, 3: 127-146.
- Fisher J, Koch J. 2008. *Born, not made: The entrepreneurial personality*. Westport, CT: Praeger.



- Frese M. 2007. The psychological actions and entrepreneurial success: An action theory approach. In Baum JR, Frese M, Baron R (Eds.), *The Psychology of Entrepreneurship*, pp. 151-188. Mahwah, NJ: Lawrence Earlbaum Associates.
- Furnham A. 1988. *Lay theories: Everyday understanding of problems in the social sciences*. Elmsford, NY: Pergamon Press.
- Gannett, A. 2012. Entrepreneurs are born. *Entrepreneur*, March 10.
- Gartner W. 1989. 'Who is an entrepreneur?' is the wrong question. *Entrepreneurship Theory and Practice*, 47-68.
- Gartner W, Carter N. 2003. Entrepreneurial behavior and firm organizing processes. In Acs Z, Audretsch D (Eds.) *Handbook of Entrepreneurship Research*, pp. 195-221. London: Kluwer.
- Gelman S. 2003. *The essential child: Origins of essentialism in everyday thought*. Oxford, UK: Oxford U. Press.
- Gollust S, Hull SC, Wilfond B. 2002. Limitations of direct-to-consumer advertising for clinical genetic testing. *Journal of the American Medical Association*, 288 (14): 1762-1767.
- Gregoire, D, Corbett, A, McMullen, J. 2008. The cognitive perspective in entrepreneurship research: An agenda for future research. *Journal of Management Studies*, 48: 1443-1477.
- Haslam N, Rothschild L, Ernst, D. 2000. Essentialist beliefs about social categories. *British Journal of Social Psychology*, 39: 113-127.
- Haslam N, Whelan J. 2008. Human natures: Psychological essentialism in thinking about differences between people. *Social and Personality Psychology Compass*, 2: 1297-1312.
- Heath C. 1999. On the social psychology of agency relationships: Lay theories of motivation overemphasize extrinsic incentives. *Organizational Behavior and Human Decision Processes*, 78: 25-62.
- Hmieleski K, Baron, R. 2008. When does entrepreneurial self-efficacy enhance versus reduce firm performance? *Strategic Entrepreneurship Journal*, 2: 57-72.
- Hoang H, Gimeno J. 2010. Becoming a founder: How founder role identity affects entrepreneurial transitions and persistence in founding. *Journal of Business Venturing*, 25: 41-53.
- Hong, Y., Levy, S. & Chiu, C. 2001. The contribution of the lay theories approach to the study of groups. *Personality and Social Psychology Review*, 5: 98-106.
- Huang, L. & Pearce, J. 2015. Managing the unknowable: The effectiveness of early-stage investor gut feel in entrepreneurial investment decisions. *Administrative Science Quarterly*, 60: 634-670.
- Jain S, Cassell, C. 2010. Societal perceptions of physicians: Knights, knaves or pawns? *Journal of the American Medical Association*, 304: 1009-1010.
- Jayaratne TE, Gelman S, Feldbaum M, Sheldon J., Petty E, Kardian SLR. 2009. The perennial debate: Nature, nurture or choice? Black and White Americans' explanations for individual differences. *Review of General Psychology*, 13: 24-33.

- Keller J. 2005. In genes we trust: The biological component of psychological essentialism and its relationship to mechanisms of motivated social cognition. *Journal of Personality and Social Psychology*, 88: 686-702.
- Klotz A, Hmieleski K, Bradley B, Busenitz L. 2014. New Venture Teams: A Review of the Literature and Roadmap for Future Research. *Journal of Management*, 40: 226-255.
- Koellinger P, Minniti, M, Schade C. 2007. 'I think I can, I think I can': Overconfidence and entrepreneurial behavior. *Journal of Economic Psychology*, 28: 502-527.
- Krueger N, Reilly M, Carsrud A. 2000. Competing models of entrepreneurial intentions. *Journal of Business Venturing*, 15: 411-432.
- Kruglanski A, Dechesne M, Orehek E, Pierro A. 2009. Three decades of lay epistemics: The why, how and who of knowledge formation. *European Review of Social Psychology*, 20: 146-191.
- Lanie A, Jayaratne TE, Sheldon J, Kardia, SLR, Anderson E, Feldbaum M, Petty E. 2004. Exploring the public understanding of basic genetic concepts. *Journal of Genetic Counseling*, 13: 305-320.
- Lazear E. 2004. Balanced skills and entrepreneurship. *American Economic Review*, 94: 208-211.
- Leibenstein H. 1968. Entrepreneurship and development. *American Economic Review*, 58: 72-83.
- Lent R, Brown S, Hackett G. 1994. Toward a unifying social cognitive theory of career and academic interest, choice and performance. *Journal of Vocational Behavior*, 45: 79-122.
- Levie J, Autio E. 2008. A theoretical grounding and test of the GEM model. *Small Business Economics*, 31: 235-263.
- Levy S, Plaks J, Hong Y, Chiu C, Dweck C. 2001. Static versus dynamic theories and the perception of groups: Different routes to different destinations. *Personality and Social Psychology Review*, 5: 156-168.
- Levy S, Chiu C, Hong, Y. 2006. Lay theories and intergroup relations. *Group Processes and Intergroup Relations*, 9: 5-24.
- Lickel B, Hamilton D, Sherman S. 2001. Elements of a lay theory of groups: Types of groups, relational styles and the perception of group entitativity. *Personality and Social Psychology Review*, 5: 129-140.
- Mantere, S., Aula, P., Schildt, H. & Vaara, E. 2013. Narrative attributions of entrepreneurial failure. *Journal of Business Venturing*, 28: 459-473.
- Maron D. 2014. What rare disease is hiding in your DNA? *Scientific American*, vol. 312.
- Markman G. 2007. 'Entrepreneurs' competencies'. In Baum J, Frese M, Baron R. (Eds.) *The Psychology of Entrepreneurship*, pp. 19-40. Mahwah, NJ: Lawrence Earlbaum Associates.
- Maurya, A. 2015. Are entrepreneurs born or made? Available at: <http://leanstack.com/are-entrepreneurs-born-or-made/> (accessed October 1, 2015)

- McMullen J, Shepherd, D. 2006. Entrepreneurial action and the role of uncertainty in the theory of the entrepreneur. *Academy of Management Review*, 31: 132-152.
- Mitchell RK, Smith B, Seawright KW, Morse E. 2000. Cross-cultural cognitions and the venture creation decision. *Academy of Management Journal*, 43: 974-993.
- Mitchell RK, Busenitz L, Lant T, McDougall, P, Morse E, Smith JB. 2002. Toward a theory of entrepreneurial cognition: Rethinking the people side of entrepreneurship research. *Entrepreneurship Theory and Practice*, 27: 93-104.
- Molden D, Dweck C. 2006. Finding meaning in psychology: A lay theories approach to self-regulation, social perception and social development. *American Psychologist*, 61: 192-203.
- Nelkin D, Lindee M. 1995. *The DNA mystique: The gene as cultural icon*. Ann Arbor, MI: U. of Michigan Press.
- Nicolaou N, Shane S, Cherkas L, Hunkin J, Spector T. 2008. Is the tendency to engage in entrepreneurship genetic? *Management Science*, 54: 167-179.
- Nicolaou, N. & Shane, S. 2009. Can genetic factors influence the likelihood of engaging in entrepreneurial activity? *Journal of Business Venturing*, 24: 1-22.
- Owens D, Mannix E, Neale M. 1998. Strategic formation of groups: Issues in task performance and team member selection. In Neale M, Mannix E, Gruenfeld, D (Eds.), *Research on Managing Groups and Teams*, 1: 149-165. Westport, CT: JAI Press
- Parker S. 2009. Can cognitive biases explain venture team homophily? *Strategic Entrepreneurship Journal*, 3: 67-83.
- Parker, S. 2013. Do serial entrepreneurs run successively better-performing businesses? *Journal of Business Venturing*, 28: 652-666.
- Paulsell S. 2008. What makes an entrepreneur? MissouriBusiness.net, December 2005. [http://www.missouribusiness.net/docs/what\\_makes\\_entrepreneur.asp](http://www.missouribusiness.net/docs/what_makes_entrepreneur.asp) (accessed September 15, 2014)
- Phelan J. 2002. Genetic bases of mental illness: A cure for stigma. *Trends in Neurosciences*, 25: 430-431.
- Pollack J, Burnette J, Hoyt C. 2012. Self-efficacy in the face of threats to entrepreneurial success: Mind-sets matter. *Basic and Applied Social Psychology*, 34: 287-294.
- Priem R, Rosenstein J. 1999. Is organization theory obvious to practitioners? A test of one established theory. *Organization Science*, 11: 509-524.
- Ramoglou, S. 2011. Who is a 'non-entrepreneur'? Taking the 'others' of entrepreneurship seriously. *International Small Business Journal*, 31: 432-453.
- Rauch A, Frese M. 2007. Born to be an entrepreneur? Revisiting the personality approach to entrepreneurship. In Baum JR, Frese M, Baron R. (Eds.) *The Psychology of Entrepreneurship*, pp. 41-66. Mahwah, NJ: Lawrence Earlbaum Associates.

- Rhode D. 1998. The professionalism problem. *William and Mary Law Review*, 39: 283-326.
- Richards, M. 1996. Lay and professional knowledge of genetics and inheritance. *Public Understanding of Science*, 5: 217-230.
- Richards M, Ponder M. 1996. Lay understanding of genetics: A test of a hypothesis. *Journal of Medical Genetics*, 33: 1032-1036.
- Riquelme, H. & Watson, J. 2002. Do venture capitalists' implicit theories on new business success/failure have empirical validity? *International Small Business Journal*, 20: 395-420.
- Rothbart M, Taylor M. 1992. Category labels and social reality: Do we view social categories as natural kinds. In Semin G, Fiedler K (Eds.), *Language, interaction and social cognition*, pp. 11-36. Thousand Oaks, CA: Sage.
- Rousseau, D. & McCarthy, S. 2007. Educating managers from an evidence-based perspective. *Academy of Management Learning & Education*, 6: 84-101.
- Sarasvathy S. 2004. The questions we ask and the questions we care about: Reformulating some problems in entrepreneurship research. *Journal of Business Venturing*, 19: 707-717.
- Sarasvathy S. 2008. *Effectuation: Elements of entrepreneurial expertise*. Cheltenham, UK: Edward Elgar.
- Shane S. 2010. *Born entrepreneurs, born leaders: How genes affect your work life*. Oxford, UK: Oxford U. Press.
- Shane S, Venkataraman S. 2000. The promise of entrepreneurship as a field of research. *Academy of Management Review*, 25: 217-226.
- Shepherd D, McMullen J, Jennings PD. 2007. The formation of opportunity beliefs: Overcoming ignorance and reducing doubt. *Strategic Entrepreneurship Journal*, 1: 75-95.
- Shepherd D, Williams T, Patzelt H. 2015. Thinking about entrepreneurial decision making: Review and research agenda. *Journal of Management*, 41: 11-46.
- Shook C, Priem R, McGee J. 2003. Venture creation and the enterprising individual: A review and synthesis. *Journal of Management*, 29: 379-399.
- Spencer-Rodgers J, Hamilton D, Sherman S. 2007. The central role of entitativity in stereotypes of social categories and task groups. *Journal of Personality and Social Psychology*, 92, 369-388.
- Turkheimer E. 2000. Three laws of behavior genetics and what they mean. *Current Directions in Psychological Science*, 9: 160-164.
- Turkheimer E. 2011. Genetics and human agency: Comment on Dar-Nimrod and Heine (2011). *Psychological Bulletin*, 137: 825-828.
- Ucbasaran D, Alsos GA, Westhead P, Wright M. 2008. Habitual entrepreneurs. *Foundations and Trends in Entrepreneurship*, 4: 309-450.

- Walsh J, Seward J. 1990. On the efficiency of internal and external corporate control mechanisms. *Academy of Management Review*, 15: 421-458.
- Wilson F, Kickul J, Marlino D. 2007. Gender, entrepreneurial self-efficacy and entrepreneurial career intentions: Implications for entrepreneurship education. *Entrepreneurship Theory and Practice*, 31: 387-406.
- Wood R, Bandura A. 1989. Social cognitive theory of organizational management. *Academy of Management Review*, 14: 361-384.
- Yzerbyt V, Rocher S. 2002. 'Subjective essentialism and the formation of stereotypes.' In McGarty C, Yzerbyt V, Spears R, *Stereotypes as explanations: The formation of meaningful beliefs about social groups*, pp. 38-66. Cambridge, UK: Cambridge U. Press.
- Zacharakis A, Meyer G. 1998. A lack of insight: Do venture capitalists really understand their own decision process? *Journal of Business Venturing*, 13: 57-76.
- Zhao H, Seibert S. 2006. The Big Five personality dimensions and entrepreneurial status: A meta-analytical review. *Journal of Applied Psychology*, 91: 259-271.
- Zhao H, Seibert S, Hills G. 2005. The mediating role of self-efficacy in the development of entrepreneurial intentions. *Journal of Applied Psychology*, 90: 1265-1272.
- Zhang Z, Zyphur M, Narayanan J, Arvey R, Chaturvedi S, Avolio B, Lichtenstein P, Larsson G. 2009. The genetic basis of entrepreneurship: The effects of gender and personality. *Organizational Behavior and Human Decision Processes*, 100: 93-107.
- Zott, C. & Huy, Q. 2007. How entrepreneurs use symbolic management to acquire resources. *Administrative Science Quarterly*, 52: 70-105.
- Zuckerman M. 2006. *Sensation seeking and risky behavior*. Washington, D.C.: APA Press.