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# The Emergence of Evidence-Based Entrepreneurship

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Many companies and leaders show little interest in subjecting their business practices and decisions to the same scientific rigor they would use for technical or medical issues. (Pfeffer & Sutton, 2006, p. 12)

## Introduction

Evidence-based entrepreneurship (EBE) pursues the science-informed practice of entrepreneurship. A prerequisite is the systematic accumulation and interpretation of the body of evidence from entrepreneurship scholarship (Rauch & Frese, 2006). EBE builds on insights from the related practice of evidence-based management (EBMgt; Rousseau, 2012), itself influenced by evidence-based approaches in medicine, criminology, and other fields.

At the same time, we must ask to what extent entrepreneurship can make use of the still controversial ideas of EBMgt. EBMgt combines four fundamental practices in making everyday managerial judgments and decisions: (1) use of the best available relevant scientific findings; (2) systematic attention to organizational facts, indicators, and metrics; (3) ongoing practice of critical, reflective judgment, and use of decision aids in order to improve decision quality; (4) consideration of ethical issues, in particular, the impact of decisions on their many stakeholders (Rousseau, 2012, pp. 4, 5).

This special issue takes stock of the current state of EBE as well as the opportunities and limits of modeling it after evidence-based practice in other fields. Importantly, differences between entrepreneurship and other fields are noteworthy. EBE faces challenges that are not equally present in the fields of management or medicine. First is the typical requirement in evidence-based practice to establish standards based on the best available evidence. For example, evidence-based medicine may lead to the recommendations that reduce variability in practice, such that doctors deliver a particular treatment for a certain diagnosis in a well-specified fashion. Entrepreneurship, on the other hand, deals with generating novelty and being different from other participants in the market. So the

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actual behavior entrepreneurs demonstrate may need to differ from other entrepreneurs, managers, and people in general in order to be truly entrepreneurial (Sarasvathy, Simon, & Lave, 1998). This may imply that entrepreneurs deviate from what is typically thought to be good management practice. Entrepreneurs are often opportunistic. They base decisions not on careful deliberations of pro and con, but on fast heuristics (Busenitz & Alvarez, 2007) and rely on improvisation (Baker & Nelson, 2005). Thus, it is plausible that evidence-based recommendations concerning entrepreneurship may be appropriately made only at higher levels of abstraction than found in other evidence-based fields. For example, entrepreneurs may be well advised to improvise in facing novel circumstances while physicians and managers may be guided by recommendations to run a series of experiments to see which best approximates the desired outcome (Rousseau, 2012; Sarasvathy, 2001).

Second, dissemination of knowledge poses a particular challenge in entrepreneurship. The number of entrepreneurs, however defined, is large and constitutes a very heterogeneous group of people. There are no credentialing systems for entrepreneurs, and no required programs or professional schools for them to enroll in before starting their businesses. In effect, passing information on to practicing and prospective entrepreneurs is difficult. Nonetheless, most advanced economies have extensive entrepreneurship policies that can be influenced by evidence-based insights and recommendations which then have effects on entrepreneurs. Similarly, venture capitalists and banks can be reached by evidence-based approaches which in turn will influence how entrepreneurs behave.

Public policy institutions play an important role in the further development of EBE. Most nations have programs that provide support to entrepreneurs, new ventures, and small businesses. By designing such programs to allow appropriate evaluation of their outcomes (cf. Storey, 2002), these institutions can contribute to the establishment of EBE. We note that many programs would lend themselves to be designed as randomized controlled experiment; in particular those that involve awarding grants and/or providing training and guidance. This would be ideal for establishing not only the effectiveness of government programs, but more importantly also what constitutes effective entrepreneurship and management of entrepreneurial firms more broadly.

## **Promoting Evidence-Based Entrepreneurship**

With these challenges in mind, we turn to the ways we believe EBE might be effectively promoted. A first step is to take stock of what we know. The most viable strategy for taking stock of the scholarly literature is to systematically review it to identify evidence relevant to important practice questions in entrepreneurship. Such reviews may take the form of meta-analyses (Hunter & Schmidt, 2004) that generate nonbiased estimates of relationships that matter to entrepreneurship practice and/or policy. Meta-analyses establish the empirical literature's best estimate of the existence, strength, and consistency in the relationship(s) between practically useful variables. A recent review tallied over 20 meta-analyses in the area of entrepreneurship (Frese, Bausch, Schmidt, Rauch, & Kabst, 2012). Sample research questions that have been studied with the help of meta-analyses are the relationship of how personality contributes to entrepreneurship (e.g., Rauch & Frese, 2007), whether planning helps entrepreneurial firms to be successful (Brinckmann, Grichnik, & Kapsa, 2010), how training and which kind of training is related to entrepreneurial success (Martin, McNally, & Kay, 2013), on strategic stance

such as entrepreneurial orientation (Rauch, Wiklund, Lumpkin, & Frese, 2009) or innovation (Rauch et al.). And, indeed, there are also examples of meta-analyses in this special issue (below).

Apart from taking stock of what already exists, EBE needs to encourage research to generate new knowledge to inform the decisions, processes, and activities of entrepreneurs (Stokes, 1997). Other fields such as medicine, clinical psychology, and organizational psychology, have linked different research designs with degrees of evidence in order to promote more useful research (Cook, Campbell, & Peracchio, 1990).

As in the case of evidence-based medicine, the randomized controlled experiment can provide high-quality evidence of what works to promote effective entrepreneurial practice. (N.B. with randomization, at the start of the experiment the group receiving the intervention is exactly comparable to the control group. The only difference between them is the intervention.) Economists now increasingly use controlled randomized experiments, particularly when studying the efficacy of interventions for entrepreneurs in developing countries (Banerjee & Duflo, 2011; Karlan & Appel, 2011). Excellent examples include providing microcredits in developing countries showing a high return on investment in micro-businesses (de Mel, McKenzie, & Woodruff, 2008). Research on the effects of training also uses randomized controlled experiments (Glaub & Frese, 2011; McKenzie & Woodruff, 2012). There are a few examples in which training concepts have been shown to provide better approaches to entrepreneurship and higher success rates (Gielnik et al., 2014). More such studies employing controlled randomized experiments would be very beneficial for the establishment of EBE. It attests to the rare nature of these studies that there was no submission of such an experiment to our special issue.

Careful longitudinal studies, in particular panel studies, are also critical. The call for longitudinal studies is by no means new, and the advantages of such designs are well-established including the possibility to study processes that unfold over time (Hassett & Paavilainen-Mäntymäki, 2013). A problem of longitudinal research designs is that data collection of course takes time and is expensive. Fortunately for entrepreneurship scholars, large-scale initiatives such as the Panel Study of Entrepreneurial Dynamics (PSED; e.g., Reynolds, 2010) and the Kauffman Firm Survey (KFS; e.g., Coleman & Robb, 2009) are now publically available for use in research. Although such initiatives are costly, we strongly encourage additional efforts to build longitudinal databases. Given the price tag, pooling of resources as done for the PSED is a valuable way forward in the establishing of EBE.

### **Articles Included in This Special Issue**

Four meta-analyses develop new knowledge in the field of entrepreneurship. The first meta-analysis is by Bae, Qian, Miao, and Fiet, and examines the relationship between entrepreneurship education and intentions (“The Relationship Between Entrepreneurship Education and Entrepreneurial Intentions: A Meta-Analytic Review”). Its first finding is that the correlation between business education and intention is smaller than the one for specific entrepreneurship education—a finding that one would expect. Its second important finding is that in general, the correlations between entrepreneurship and business education with intentions are lower than most entrepreneurship researchers would expect. A further finding is that cultural practices influence the size of the correlations significantly. However, the most important finding for practice is a near zero and nonsignificant relationship between entrepreneurial/business education and the intention to start a business, when prior intentions are controlled for. This means that by and large, students come

into entrepreneurship with a certain entrepreneurial intention and leave that program with that same intention. Thus, a reverse causation argument is more likely supported here; the intention to start a business determines whether somebody takes a course in business or entrepreneurship, and there is no change of entrepreneurial intention because of education. Of course, as in all meta-analyses on entrepreneurship, there is a high degree of heterogeneity in the empirical correlations. This implies that policy makers have to assume differentiated response to education, and researchers need to do much more research to find the best way to increase entrepreneurial intentions. But at least we can conclude: “Not all is well in the state of entrepreneurship and business education,” and future studies need to develop ideas, specifically on what influences entrepreneurial intentions and entrepreneurial behaviors, and new research is called for in this area.

The second meta-analysis addresses cultural and macroeconomic moderators of the relationship between entrepreneurial orientation and entrepreneurial performance (Saeed, Yousafzai, & Engelen: “On Cultural and Macroeconomic Contingencies of the Entrepreneurial Orientation–Performance Relationship”). There are, indeed, moderators of the relationship, which includes cultural moderators (such as uncertainty avoidance, power distance, and in-group collectivism), as well as politico-economic moderators (such as developing country and political stability). It is important to note that even after the introduction of moderators, there is still a sizeable heterogeneity of correlations left, suggesting that there is a need to look at other moderators for researchers and for practitioners to assume that there are important contextual conditions which are at this point scientifically unknown.

A different type of analysis is presented in Schlaegel and Koenig in “Determinants of Entrepreneurial Intent: A Meta-Analytic Test and Integration of Competing Models.” Entrepreneurial intentions have been extensively studied, often as a proxy for actual behavior. Different models intended to explain such intentions have been proposed. Schlaegel and Koenig test the predictive power of the two most common theoretical models, and then integrate them into a more powerful yet parsimonious model. Their findings that some commonly used variables influence intentions to a large extent, and other variables only to a small extent have implications for scholars, entrepreneurs, and educators alike. For example, it is valuable for the owners of a family business to know what makes their children more or less interested in pursuing entrepreneurship.

The article “A Qualitative Approach to Evidence-Based Entrepreneurship: Theoretical Considerations and an Example Involving Business Clusters” by Rauch, van Doorn, and Hulsink outlines principles, guidelines, and examples for synthesizing the findings of qualitative research. Thus, this is the first qualitative meta-analysis reported in evidence-based management and entrepreneurship. As in quantitative aggregations, the purpose is to generalize *findings*. Individual case studies and qualitative research more generally typically don’t seek such generalizations, but the novel approach presented herein allows for it. Given the strengths of case studies when it comes to providing contexts to findings, and shedding light on minority phenomena, such qualitative synthesizing of findings complements quantitatively-based EBE.

Next, in the article “Creating the Future Together: Toward a Framework for Research Synthesis in Entrepreneurship,” van Burg and Romme suggest a research synthesis, to take stock of findings from entrepreneurial research on exploitation of opportunities and the results achieved. A research synthesis assesses the body of work relevant to a practical question where both qualitative and quantitative studies are considered (Rousseau, Manning & Denyer, 2008). Importantly, van Burg and Romme demonstrate the antecedents of opportunities, their exploitation and performance (such as entrepreneur’s personal characteristics and beliefs as well as external and organizational factors), but also the

factors that mediate their effect on entrepreneurial opportunities. These mediators include entrepreneurial cognitions (searching, scanning, framing, and interpreting) as well as social ties and interactions.

Importantly, Steffens, Weeks, Davidsson, and Issak “Shouting From the Ivory Tower: A Marketing Approach to Improve Communication of Academic Research to Entrepreneurs,” demonstrate that entrepreneurs can have particular preferences regarding the presentation of research findings. They provide empirical evidence of a preference to receive research summaries characterized by rich details but minimal use of jargon. Also important are the details provided regarding the authors’ academic and industry credentials. The opportunities to better present and publicize research findings in entrepreneurship are plentiful.

### **Attending to the Controversies in EBE**

We are fully aware of the controversial nature of the idea of EBE, and this special issue sought to generate thoughtful discussion of these disputed issues. We would have preferred more controversial input regarding the pros and cons of EBE (perhaps the most controversial here is the contribution by van Burg and Romme).

A controversy concerns the identification of effective entrepreneurial action, what some might refer to as “best or promising practices.” The outcomes of entrepreneurial actions are typically more salient than the outcomes of managerial actions since entrepreneurs often have a strong and sometimes even immediate impact on the very survival of their firms. In one sense, the availability of clear outcomes might suggest that evidence of what works is readily available. However, to date, systematic observations of the practices of entrepreneurs and the outcomes of their actions have been rare (cf. Dimov, 2011). The tendency to treat entrepreneurial behavior as unsystematic and improvised may have discouraged researchers from giving it more critical attention. Moreover, conventional wisdom asserts an immutable fact of entrepreneurship, that is, the high mortality rate of start-ups. Acceptance of this “fact” as inevitable may have turned scholarly attention toward matters that seem to be more controllable (such as entrepreneurship training, funding arrangements, social networks, etc.).

Another example of the controversies in EBE is the debate regarding whether research articles are really able to help improve science-informed practice. This debate exists in the area of management generally (Pearce & Huang, 2012) and in human resource management (Rynes, Colbert, & Brown, 2002). One answer is provided by the thought-provoking article by Steffens et al. in this special issue. A recent meta-analysis demonstrated that venture capital providers display little acumen in selecting good business partners. It also shows how difficult is the prediction of good business opportunities as well as how little professionals in this area know about making good predictions (Rosenbusch, Brinckmann, & Mueller, 2013). We also believe that Bae et al.’s meta-analysis in this special issue might lead to better intervention programs to enhance entrepreneurship than exists at the moment in entrepreneurship and business courses. Finally, we think that the approach by Schlaegel and Koenig of increasing synergetic integrations of competing models is useful—and so is to develop clearly competing models in entrepreneurship research. More such discussions are needed in EBE.

### **Conclusion**

There are several constituents that can benefit from the establishment of evidence-based entrepreneurship (EBE). These include educators and trainers in entrepreneurship

programs, entrepreneurship policy makers, providers of capital for new ventures, and practitioners who are willing and able to expand their knowledge and expertise. Consultants to entrepreneurial firms also would do well to consult EBE before they are advising entrepreneurs on one remedy or another. Of course, the recipients of suggestions by consultants may also be critical customers in the sense of examining results before agreeing to follow the consultants' advice. We (the authors) ourselves regularly consult articles and abstracts disseminated by the Cochrane foundation before taking medicine prescribed by physicians or undergoing an operation. Such abstracts are plentiful in medicine and highly informative to people who understand a little statistics; and they are also free. We anticipate a time in which science provides similar services to managers and entrepreneurs. Similar to medicine, people will understand that context issues are important and that in the last analysis, the individual case needs to be considered before suggesting new behaviors and other advice to entrepreneurs; however similar to medicine, people will become better consumers of such advice if they know the average outcomes that have occurred from following it as reported in the literature.

Last, we propose that entrepreneurs make more regular use of the data they already have in order to enhance their practice. The study of entrepreneurial practice and in particular the reciprocal link between entrepreneurial action and environmental feedback is hugely important input to EBE. Data that already exist in entrepreneurial firms may be used in a more reflective fashion when EBE ideas become prevalent. One of the most admired firms—Google—has developed an evidence-based approach to presentation of Internet sites, marketing, and management and has grown considerably on the basis of a strict empirical approach.

The articles presented in this special issue attests to the richness of approaches that can help furthering EBE. We hope this issue inspires others to provide further evidence regarding entrepreneurial practices that work (and those that don't) and under what conditions.

## REFERENCES

- Baker, T. & Nelson, R.E. (2005). Creating something from nothing: Resource construction through entrepreneurial bricolage. *Administrative Science Quarterly*, 50, 329–366.
- Banerjee, A.V. & Duflo, E. (2011). *Poor economics: A radical rethinking of the way to fight global poverty*. New York: Public Affairs, Perseus Books Group.
- Brinckmann, J., Grichnik, D., & Kapsa, D. (2010). Should entrepreneurs plan or just storm the castle? A meta-analysis on contextual factors impacting the business planning–performance relationship in small firms. *Journal of Business Venturing*, 25, 24–40.
- Busenitz, L. & Alvarez, S. (2007). Cognition and capabilities in entrepreneurial ventures. In J.R. Baum, M. Frese, & R.A. Baron (Eds.), *The psychology of entrepreneurship* (pp. 131–150). Mahwah, NJ: Lawrence Erlbaum Publishers.
- Coleman, S. & Robb, A. (2009). A comparison of new firm financing by gender: Evidence from the Kauffman Firm Survey data. *Small Business Economics*, 33, 397–411.
- Cook, T.D., Campbell, D.T., & Peracchio, L. (1990). Quasi experimentation. In M.D. Dunnette & L.M. Hough (Eds.), *Handbook of industrial and organizational psychology* (2nd ed., Vol. 1, pp. 491–576). Palo Alto, CA: Consulting Psychologists Press.
- de Mel, S., McKenzie, D., & Woodruff, C. (2008). Returns to capital in microenterprises: Evidence from a field experiment. *Quarterly Journal of Economics*, 123, 1329–1372.

- Dimov, D. (2011). Grappling with the unbearable elusiveness of entrepreneurial opportunities. *Entrepreneurship Theory and Practice*, 35, 57–81.
- Frese, M., Bausch, A., Schmidt, P., Rauch, A., & Kabst, R. (2012). Evidence-based entrepreneurship (EBE): Cumulative science, action principles, and bridging the gap between science and practice. *Foundations and Trends in Entrepreneurship*, 8, 1–62.
- Gielnik, M.M., Frese, M., Kahara-Kawuki, A., Katono, I.W., Kyejjusa, S., Munene, J., et al., (2014). Action and action-regulation in entrepreneurship: Evaluating a student training for promoting entrepreneurship. *Academy of Management Learning & Education*, in press.
- Glaub, M. & Frese, M. (2011). A critical review of the effects of entrepreneurship training in developing countries. *Enterprise Development & Microfinance*, 22, 335–353.
- Hassett, M.E. & Paavilainen-Mäntymäki, E. (2013). *Handbook of longitudinal research methods in organisation and business studies*. Cheltenham, UK: Edward Elgar Publishing.
- Hunter, J.E. & Schmidt, F.L. (2004). *Methods of meta-analysis: Correcting error and bias in research findings* (2nd ed.). Thousand Oaks, CA: Sage.
- Karlan, D. & Appel, J. (2011). *More than good intentions: How a new economics is helping to solve global poverty*. New York: Dutton, Penguin Group.
- Martin, B.C., McNally, J., & Kay, M. (2013). Examining the formation of human capital in entrepreneurship: A meta-analysis of entrepreneurship education outcomes. *Journal of Business Venturing*, 28, 211–224.
- McKenzie, B. & Woodruff, C. (2012). *What are we learning from business training and entrepreneurship evaluations around the developing world?* Washington, DC: Worldbank.
- Pearce, J.L. & Huang, L. (2012). The decreasing value of our research to management education. *Academy of Management Learning and Education*, 11, 247–262.
- Pfeffer, J. & Sutton, R.I. (2006). *Hard facts, dangerous half-truths, and total nonsense*. Boston, MA: Harvard Business School.
- Rauch, A. & Frese, M. (2006). Meta-analyses as a tool for developing entrepreneurship research and theory. *Advances in Entrepreneurship, Innovation, and Economic Growth*, 9, 29–51.
- Rauch, A. & Frese, M. (2007). Let's put the person back into entrepreneurship research: A meta-analysis on the relationship between business owners' personality traits, business creation, and success. *European Journal of Work & Organizational Psychology*, 16(4), 353–385.
- Rauch, A., Wiklund, J., Lumpkin, G.T., & Frese, M. (2009). Entrepreneurial orientation and business performance: An assessment of past research and suggestions for the future. *Entrepreneurship Theory and Practice*, 33(3), 761–787.
- Reynolds, P.D. (2010). New firm creation in the United States: A PSED I overview. *Foundations and Trends in Entrepreneurship*, 3(1), 1–150.
- Rosenbusch, N., Brinckmann, J., & Mueller, V. (2013). Does acquiring venture capital pay off for the funded firms? A meta-analysis on the relationship between venture capital investment and funded firm financial performance. *Journal of Business Venturing*, 28(3), 335–353.
- Rousseau, D.M. (2012). Envisioning evidence-based management. In D.M. Rousseau (Ed.), *The Oxford handbook of evidence-based management* (pp. 3–24). Oxford, U.K.: Oxford University Press.
- Rousseau, D.M., Manning, J., & Denyer, D. (2008). Evidence in management and organizational science: Assembling the field's full weight of scientific knowledge through syntheses. *Academy of Management Annals*, 2, 475–515.

Rynes, S.L., Colbert, A.E., & Brown, K.G. (2002). HR professionals' beliefs about effective human resource practices: Correspondence between research and practice. *Human Resource Management, 41*, 149–174.

Sarasvathy, S.D. (2001). Causation and effectuation: Toward a theoretical shift from economic inevitability to entrepreneurial contingency. *Academy of Management Review, 26*, 243–263.

Sarasvathy, D.K., Simon, H.A., & Lave, L. (1998). Perceiving and managing business risks: Differences between entrepreneurs and bankers. *Journal of Economic Behavior & Organization, 33*, 207–225.

Stokes, D.E. (1997). *Pasteur's quadrant—Basic science and technological innovation*. New York: Brookings Institution Press.

Storey, D. (2002). Methods of evaluating the impact of public policies to support small businesses: The six steps to heaven. *International Journal of Entrepreneurship Education, 1*, 181–202.

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