Extraordinary: Reflections on Sample Representativeness

Viktor Dörfler – Marc Stierand

Abstract

In this chapter we reflect on a particular way of studying immensely high complexity, such as creativity, by investigating extraordinary achievers. The basis of our reflections are two empirical studies, one conducted in the area of haute cuisine, through interviewing top chefs, and the second conducted in the area of science, thorough interviewing Nobel Laureates. We explore why we feel that studying such extraordinary individuals can be more fruitful for better understanding creativity than trying to achieve an artificially manufactured sample that provides insights about the creative potential of the average individual. We outline the problems we see with the notion of representative samples from both conceptual as well as feasibility perspectives and offer an argument for studying the extraordinary instead.

Keywords: qualitative research, significant samples, representativeness, extraordinary, generalizability

Introduction

In this chapter we offer a reflection on the notion of sample representativeness from an interpretivist-qualitative perspective. Specifically we are looking into the idea of learning about a phenomenon through examining extraordinary individuals characterized by that phenomenon; to describe them we use the term *'extraordinary'* as a noun, thereby building on Howard Gardner's notion of 'extraordinary minds' (Gardner, 1997). We are looking at the 'extraordinary' in their professional socio-historical contexts, as the phenomena we are interested in cannot be divorced from the contexts in which they are embedded. In this particular book

chapter we are interested in the phenomenon of creativity, and the two research projects on which we base our argument are also concerned with creativity. However, we do not see any reason why similar considerations could not be made in other areas – but we do not suggest that a simple generalizability is possible.

The basis of our reflection are two research projects we have done in the past: In the first one, we conducted 'insider interviews' (the second-named author used to be a chef in Michelin-starred restaurants) with 18 extraordinary chefs in order to gain a better understanding of how creativity manifests itself socio-culturally in the culinary domain (Cousins, O'Gorman, & Stierand, 2010; Stierand, 2015; Stierand & Dörfler, 2012b, 2016; Stierand, Dörfler, & MacBryde, 2014; Stierand & Lynch, 2008). In the second one, we interviewed 20 extraordinary scientists, including 17 Nobel Laureates in order to gain a better understanding of cognitive complexity and how cognitive complexity is manifested in the socio-cultural acceptance of creative outcomes in the scientific world (Dörfler & Eden, 2014a, 2014b, 2017).

We have presented our research at various conferences, and, perhaps as we were so passionate about it, we have received a great deal of interest from others, mainly PhD students and early career researchers, who were keen to undertake similar research projects. But, although we believe that the methodological journey we have taken can be an excellent path to very interesting and meaningful research, we cannot wholeheartedly recommend it to junior colleagues, knowing the difficulties they will face when trying to justify their findings and methodological choices and the uncertain profits in the form of publication of the results (see an excellent overview of the difficulties and profits in Lebuda, 2014). We made our initial methodological choices, i.e. interviewing extraordinary chefs and scientists, purely intuitively that is, we just knew that the insights we could gain from these people would potentially lead to excellent findings. However, this is not an acceptable justification in the academic world. Therefore, we started to develop a framework for conducting this type of research, but we are not quite there yet. This reflection chapter is a midway point for taking stock of the convincing arguments we have developed over time and of the problems we still need to solve.[1]

[1] ACKNOWLEDGEMENT: We have presented various aspects of our thinking about this topic as a series of developmental papers (Dörfler & Stierand, 2009; Stierand & Dörfler, 2011, 2012a, 2013) in the Research Methodology Special Interest Group (RM SIG) of the British Academy of Management (BAM) conference. We would like to thank members of the RM SIG as over the years they helped us clarify our thinking with their constructive criticism, comments and most of all questions for which we did not have satisfactory answers.

The Purpose of Sample Representativeness: The Principle of Generalizability

The reason for aiming to work with a *representative sample* is to achieve generalizability of the research findings from the sample to the whole population of instances about which we inquire. After all, generalizability is considered by many as the 'Holy Grail' of research, because it is considered to be a precondition for theory building (Wacker, 1998; Weick, 1989, 1995), referring "to the extent to which research findings apply to contexts other than the one researched" (Gibbert, 2006: 126). It is important to note that this description of generalizability goes beyond applying the findings from the sample to the population; it also includes applying those findings in different populations. However, for now we are only concerned with generalizing from the sample to the population. Also, it is essential keeping in mind that it is not the property of the *theory* but of the *research findings* that makes it possible to support or falsify a theory (cf Gibbert, op cit).

In order to achieve findings that can be generalized from the sample to the population, researchers usually try to employ a sample that is representative. Representative means that the sample should replicate all the salient features, and their statistical frequency, of the population from which it has been drawn. As the phenomenon under scrutiny is also one of the salient features, this means that if we do have a representative sample, our research findings should be generalizable by definition. But, how can we achieve a representative sample?

Before answering this question, we need to unpack one further assumption about generalizability. Generalizability is usually identified with external validity, because it is concerned with 'the intuitive truthfulness of the theory' (cf Gibbert, Ruigrok, & Wicki, 2008) about a phenomenon beyond the setting in which the phenomenon has been studied (e.g. Calder, Phillips, & Tybout, 1982; Eisenhardt, 1989; Gibbert, 2006; McGrath & Brinberg, 1983; Scandura & Williams, 2000). If, for instance, we are interested in how scientists create their models, we should find a setting in which we conduct the empirical study, but we would want to come up with something that applies to all scientists. Intuitively there is something very wrong with this expectation: scientists may have a variety of ways of creating their models, and even the same scientists may do this differently in different professional socio-historical contexts. Furthermore, we tend to forget that external validity, as the third level of validity,

assumes that the previous two levels, namely the internal consistency and the construct validity, are satisfied as well. Internal consistency simply stands for a model with no contradictions, and we are ready to accept this to be satisfied since someone of the research community, for instance reviewers, should notice any contradiction sooner rather than later. Construct validity refers to the extent to which an inquiry is able to portray a truthful picture of reality and actually studies what it claims to be studying (Denzin & Lincoln, 2000; Gibbert et al., 2008). Construct validity is thus typically associated with the data collection phase (Gibbert et al., 2008: 1467) – however, we are still at the point of choosing our sample, and therefore we should assume that generalizability also needs to cover construct validity. We will get back to this point later, when we offer an alternative view of what makes a representative sample.

Hence, if the representative sample should replicate all the salient features of the population together with their statistical frequencies, we need to control for all possible salient features. Even if we did, we cannot be sure that the phenomenon that we study would also be replicated, as we cannot control for that at the time when we are investigating it, and we have to admit that for any human and social phenomena this would be simply impossible: For human phenomena, this would mean having a control for every single human characteristic, and for social phenomena, in addition to these, we would also need to cover all relationships, interactions and influences between humans. According to this logic, if we want, for instance, to study the phenomenon of creativity in the culinary domain, we would then typically try to examine a representative sample of chefs in order to achieve general statements from our findings that apply to the whole population of chefs. Therefore, for the sampling process we would need to account not only for the culinary skillset of each chef, but also for their personality, people they work with, the intellectual tradition of the domain (for which we would need to consider the previous generation, and the one preceding it, and so forth, all the way back to the creation of the domain), all the interactions, and even for the mood of the particular chefs at the time of the investigation. Moreover, even if we would be able to do this somehow, we would need to do it for the whole population first, as otherwise we cannot make sure that the sample was representative!

Furthermore, assuming for a moment the impossible of having fulfilled all the above conditions for achieving a representative sample of chefs, we may still ask: What could we learn

from our research? Probably quite a few things about the *population of chefs* but perhaps very little about the *phenomenon of creativity*, because the sample is representative of the population of chefs but not of the phenomenon of creativity! We understand that this argument is harsh, and we admit that we are exaggerating a little bit – but only a little bit, to emphasize the underlying uncertainty. Intuitively, however, it makes sense that if we are establishing a sample that is representative of the population, it will reflect the population, but there is nothing to suggest that the phenomenon of creativity has any level of uniformity over the representative sample or over the population chefs. The argument is perhaps more obvious in case of exceptional creativity but by implication this can be extended to creativity more generally – there are no chefs with 'average creativity', some are more creative, some less.

Problems with Sample Representativeness: The Principle of Mediocrity

As aforementioned, if a sample is representative of a population, it will replicate its features and thus also the research findings. Consequently, what does it then mean that we could learn quite a bit about the population of chefs? To put it bluntly: learning about the population of chefs means that we could learn things about the average chef (thereby substituting the 'average creativity' of the chefs with the 'creativity of the average chefs') while knowing that this chef is not real and does not exist. Naturally, we would also learn how much members of the sample can deviate from this average, but what could we learn about creativity in the culinary domain? Maybe something along the lines that the average chef produces 17.34 creative dishes each year. Whereby being creative could mean many different things, from replacing thyme for rosemary to inventing hot ice-cream. How can we be satisfied with such findings? If a shoe factory averaged out our feet sizes and produced only shoes at size 8.76 (UK measure), would we be happy wearing these shoes? Are we academics really so much more willing to compromise than the shoemakers? It seems that we not only believe that a representative sample can be achieved, but also that the average of this sample is representative of its population!

Still, even if we are willing to compromise, we need to go back to the question of how to achieve a representative sample. Conventional wisdom suggests that if a sample is sufficiently large it should be representative. This is intuitively obvious: if the whole population is the sample, it will certainly be representative and the fewer are missing from the whole population, the smaller the sampling error. In real life, though, we often need, for reasons of practicality, a much smaller sample to be representative. And here is a clever trick: we use a random sample and assume that it is representative. The basis of this assumption is that the laws of chance self-correct the outliers present in any population. However, we firmly believe that this is a false heuristics based on the assumption that the laws of chance are fair and reinstate equilibrium every time there is a deviation from the equilibrium, meaning in the context of samples, reinstating the average. This is what Kahneman and Tversky label the 'belief in the law of small numbers', and it seems to lack any basis (Kahneman & Tversky, 1972; Tversky & Kahneman, 1971). Furthermore, we face three further problems with this approach: (1) the population uniformity, (2) the technical feasibility of randomizing, and (3) the reference point of population and phenomenon.

Population uniformity alias the black swan problem. When John Stuart Mill (1861) developed his inductive method in order to operationalize Sir Francis Bacon's (1620) principle of 'true induction', he actually declared that the nature is uniform. Not too many noticed this then, and not many are aware of this now. However, this is what really led to the black swan problem, which did not only destroy induction but deduction as well: How many swans we need to see in order to know that all swans are white? The only correct answer is: *all of them*. Thus, in induction we would need to examine all instances of a population and in deduction we would need to verify our hypothesis against all instances of a population to make any rigorous claims. But, why can we not substitute a random sample for the whole population? On the one hand, as we said previously, because the laws of chance may not be fair. On the other hand, as the population is *very far* from uniform. This is emphasised by March et al.'s (1991) example of rare high-impact events in organizations, Taleb's (2008) delineation of 'Extremistan' and 'Mediocristan', and Gladwell's (2008) notion of outliers. A simple example: let us assume that a research agency would use a random sample of 100 people to survey what people in the US spend their money on. Income will be one of the variables to be considered and, of course, is a volatile variable, particularly if someone like Bill Gates or Larry Page would

make it into the sample. Thus, the problem of the outliers is not that they deviate from the average, but that they can deviate so much, that it affects the average itself.

Technical feasibility of randomizing. If after all this, we would accept all the shortcomings and actually attempt to get a random sample, we are stuck once again. How would we attempt this? 'Generating' something at random is not as easy as it seems. Even generating random numbers for a spreadsheet table is difficult; we can only generate random numbers according to a particular distribution function. But, how could we randomize chefs or scientists? First, collecting all the names in the population would be a tedious task. Then, we need to somehow randomly choose from the list, and this would always lead back to the 'not-entirely-random' generated numbers. Therefore, the usual approach is not to pay attention to anything and simply trusting in the fairness of the chance. However, often even unenticingly the sample gets biased. For instance, in the Nobel Laureates project (there was no random sample there), the person transcribing the interviews concluded that the Nobel Laureates seem to be 'lovely people'. Actually, there is a built-in bias in the system: those who agreed for an interview must have been 'nice people', otherwise they would probably not have agreed to participate in the interview. Hence, simply conducting the interviews created a bias.

Reference point of population and phenomenon. We noted earlier that the notion of generalizability comprises, apart from external validity, also the construct validity. Thus, we have to ask: Can a random sample of chefs generate findings about the phenomenon of creativity in the culinary domain? Or, can a random sample of scientists lead to findings that tell us about cognitive complexity? The answer is actually not a strict 'no' – it would be more correct to say 'probably no', but even if the findings would tell us something about these phenomena, we will not know about it. The reason for this is that our awareness would be so occupied with the *proximal*, with the samples of the chefs or scientists in front of our eyes, that we would not be able to focus anymore on the *distal*, on the phenomena that they represent and that we are interested in (Dörfler & Ackermann, 2012; Polányi, 1962a: 55-65). Of course, "we are aware of that from which we are attending to another thing, in the appearance of that thing" (Polányi, 1966: 11). However, it would lead us nowhere if we dissected Rachmaninoff's fingers, comparing them to the average piano players' fingers; we would know nothing about the essence of romantic classical music. Instead, we have to get intuitively into Rachmani-

noff's mind, wander down to his fingers and feel ourselves what it means to represent romantic classical music. In a sense, we have to forget about Rachmaninoff as a composer and start picturing through him the essence of romantic classical music. This is what we mean by attending from the proximal (i.e. the sample of composers, chefs or scientists) to the distal (i.e. the phenomenon of romantic classical music, creativity or cognitive complexity). And, in order to make this intuitive journey, we need to travel through the 'extraordinary', because they have developed into the embodiment of the phenomena they represent.

Revising the Notion of Sample Representativeness: The Principle of Extraordinary

The methodological approach that we have used in our chefs and top scientists studies is grounded in the seminal works of Csíkszentmihályi (1997) and Gardner (1993). Csíkszentmihályi conducted a series of interviews with 91 exceptionally creative individuals and Gardner processed the complete lives of seven extraordinary creative individuals of the modern era. If we examine these works more closely, we will find that they yielded incredible insights, resulting in new conceptual models of formidable explanatory power that are frequently used as frameworks or starting points by creativity researchers. They also served as basis for further significant results of these authors.

By focusing on 'the extraordinary', Csíkszentmihályi did not only arrive at the systemic view of creativity, immensely popular in the social psychology research on creativity today, but was also able to theorize the initial version of the 'flow' concept (Csíkszentmihályi, 2002). In turn, Gardner, who regularly uses Csíkszentmihályi's systemic view of creativity, realised that Gandhi was somehow different from the other six examined extraordinary individuals, and from this basis arrived at a powerful account of the essence of leadership – examining this time the lives of several extraordinary leaders (Gardner, 1995). Furthermore, on the basis of these two works Gardner gained insights into the making of extraordinariness (Gardner, 1997). With hindsight, we can also see that Maslow (1968, 1970) examined the extraordinary (i.e. extraordinary individuals as well as extraordinary experiences of otherwise ordinary people) and thereby uncovered the experience of self-actualisation (a comprehensive discussion of using extraordinary as "significant samples" can be found in Simonton, 1999).

Based on these studies, 'the extraordinary' can be described as an autotelic individual who is able to destroy or fundamentally alter existing structures within a domain, shut down existing domains or create entirely new domains. Therefore, we argue, that by studying the extraordinary we can gain a better understanding of domains, neighboring domains as well as of complex phenomena within these domains. Hence, we argue that extraordinary individuals are more representative of their domain than the 'normal' population in that domain, and also more representative of some of the exceptionally complex phenomena in that domain, such as creativity. As Simonton (2014: 11) says, such significant sample "contains exemplary cases of the phenomenon".

With this argument, we do not intend to downplay the significance of more mundane forms of creativity and we are certainly not suggesting that creativity is the sole domain of those who achieved extraordinary results. Furthermore, we also acknowledge the problem of identifying the extraordinary; this works well in some domains, where there is a formalized and generally accepted structure of gatekeepers, such as the Michelin guide in haute cuisine and the Nobel Prize committee in science. This does not mean that in other areas, such as in retail for example, there are no extraordinary creators, only that we would have hard time to justify their extraordinariness. However, such justification is primarily important from an academic perspective, that is, for doing research. Those who are in a particular field of retail will probably know who the extraordinary are in their respective domains.

We suggest that a physics Nobel Laureate is likely to be closer to the essence of being a physicist than 100 of the 'average physicists', and closer to the phenomenon of creativity in the domain of physics. Similarly, a Michelin-starred chef is likely to be closer to the essence of being a chef than a sizeable random sample of average chefs and closer to the essence of creativity in the culinary domain. (Assuming that there is an essence of creativity, which may also depend on the socio-historical context.) We were very careful in our formulation here, and we used 'likely' to tune down what we say. There is a tiny little chance that a Nobel Laureate or a Michelin-starred chef is not extraordinary. Still, we chose to work with this substitution, as this is as close as one can get to justifying that someone is extraordinary. There are certainly others, perhaps many, who do not have a Michelin star or Nobel Prize, who are also extraordinary, but those who won the highest accolades of their respective domains, should fall in this category.

Having conceptualized this argument for studying the extraordinary, we have realized that we are replicating a two millennia old story: we seem to be talking about the Platonic ideas. The Michelin-starred chef and the Nobel-Prize-winning physicist are closer to the idea of 'chef' and 'physicist' as well as to the idea of 'creativity'. We have also found evidence that creativity transcends the domains, as not only the Nobel Laureates of the different sciences were giving similar accounts of what they do, and how they feel about their domains, but also the chefs provided accounts of creativity that show an almost scary similarity to those of the scientists. However, as noted before, we have to be mindful of the socio-historical context – if there is a domain-transcending aspect of creativity, it does not neglect the importance of the situational aspects, interactions, etc. We are simply exploring one side of the coin, but we do not suggest that the other side does not exist.

Studying the extraordinary chefs and scientists, we would say that these people are really in love with what they do, they are hooked, perhaps even obsessed with creating and with understanding the world of their respective domains a bit better. Hence, we claim that the extraordinary is not representative of the population, but, in fact, representative of the domain and of the phenomenon. How can this be explained? Polányi's (1962a) conceptualization of personal knowledge can help us understand why this works.

Polányi suggests that the personal knowledge overcomes the objective-subjective dichotomy by focusing the interest on the phenomenon itself. This is captured in the notion of 'indwelling' (1962a, 1962b). The knower who is in love with the domain and with the object of knowing feels unimportant from the perspective of the knowing process – in a sense, they almost disappear, their indwelling becomes so deep. A similar idea is outlined by Maslow (1966: 53) as the 'Taoist conception of science' by saying:

> *"… one must be able to respect what one is examining or learning about. One must be able to let it be itself, to defer to it, even to approve of its being itself, and to feel reward and even joy in watching it be itself, i.e., unfolding its own inner nature, undisturbed and unchanged by the nature of the observer, unintruded upon."*

This means that extraordinary individuals think that their domains and the problem they are engaging in is far more important than they are themselves, and this love and respect gives them the strength to get so incredibly exposed that in this openness they somehow fuse with their domain and with what they study. We could call this 'complete indwelling'. This observation also explains why highly knowledgeable people in all domains seem to have their primary loyalty to their domain, and only secondarily to the organization for which they work. For our chefs and scientists it is fundamentally important that the culinary domain or physics advances, that if their organization does not make it possible for them to work on this advancement, they will leave, because they feel that this is in the best interest for their domain. Don't mistake this for humbleness! Far from that. If these people would be humble, they would think that someone else will progress their domain; that someone else will figure out what needs to be done. But, no, they feel and know that it is their duty and purpose, because they are the most capable!

We need to note, that our interest in these two studies was not to understand what the great chefs and scientists are like, we were interested in what creativity in the culinary domain and cognitive complexity of scientists is like at the highest level of expertise. Hence, we did two things: first we identified the extraordinary as representative of the particular phenomena we were interested in, and then we substituted Michelin stars and Nobel Prizes for the notion of the extraordinary. We believe that this worked out quite well.

> *"If we want to know how fast a human being can run, then it is no use to average out the speed of a 'good sample' of the population; it is far better to collect Olympic gold medal winners and see how well they can do." (Maslow, 1971: 7)*

We have received a question at this point, actually many times, about whether we would discourage people who are not extraordinary. Of course not, for two reasons. Not only those should run, who win the Olympic gold medal. And, it is good to play football (soccer) even if someone cannot play like Pelé (https://en.wikipedia.org/wiki/Pelé) and will never be able to become Pelé. And this is fine. However, we personally believe that people should only play professionally, if they *want to* become the next Pelé. Even a second-league player should watch Pelé's game. Those who are not interested in how Pelé plays they should only play for

recreation. Linking this with the above argument on more mundane creativity, we are sure there are many Pelés out there to be discovered but as long as they have not proved themselves in a world championship, we don't know who they are, we may only suspect that some of the talents we follow over time could become the next Pelé (see Stierand, 2015).

Commentary

In the course of publishing our findings based on extraordinary chefs and scientists, we have been repeatedly asked to do a comparison to 'not-so-extraordinary' members of the same populations. Although we do see value in a comparative study, we rejected to do this in the particular papers we were publishing so far and in this final part of our chapter, we want to provide reasons as to why we rejected this line of research. The way we present our reasons is meaningful, but speaks to intuitive rather than analytical comprehension; we are yet to find formulations that could pass the criteria of academic journals.

First, studying the extraordinary is incredibly exciting in its own right. We have to emphasise that we do not assume that only those chefs in the Michelin Guide can be extraordinary or that all extraordinary scientists won the Nobel Prize. All we assume is that those who have been awarded these highest accolades are at the top of their domain, but we are ready to admit that many others may also be there. As researchers we could simply 'feel' how we are developing, growing, being embedded in this process. For instance, in one of the papers about the Nobel Laureates research, the topic was how they see excellent research. While there would be merits in comparing how extraordinary and non-extraordinary characterise excellent research, we found it more interesting how those extraordinary researchers see it, who regularly conduct excellent research. The comparison can only come later, and it could be useful, for example, for the 'not-so-excellent' to become better.

Second, it is unclear what the reference point of the comparison should be. What should be juxtaposed to the Michelin-starred chef? The celebrity TV chef, a professional chef in a res-

taurant chain, a fast-food food cook or a hobby cook? Similarly, with whom should we compare a physics Nobel Laureate? With someone nominated, who did not get it?[2] What if the nominee gets it next time? Or with a physicist who only publishes in B-journals? Or with a secondary-school physics teacher? And even if we decided on the counter-example, how would we start such an interview? We would not expect much success from an interview starting: 'I would like to talk to you about your mediocre research to contrast it with those who are really good.' Of course, it would be sensible to compare the top tier with the penultimate one. However, for this we would first need to have people classified into different tiers, and in most disciplines we do not have such classifications. We do in chess, which is why much of the research into the levels of expertise was conducted with chess players. We believe that investigating the extraordinary can also be helpful in developing these levels.

However, the third point is the most difficult one. The biggest problem is that the mediocre and the extraordinary are not in the same discipline, regardless if the name is the same. As Ferran Adrià, one of the extraordinary chefs we interviewed, said:

> *"[C]omparing the cooking here with home-cooking is like comparing a Formula 1 car with an old Daimler with which you cruise and enjoy the scenery… The two have absolutely nothing to do with each other… It is absolutely not like home-cooking and it is not familiar cooking!" (Ferran Adrià quoted in Stierand et al., 2014: 23)*

Another compelling example we have found in a book by the Hungarian writer Péter Esterházy about football/soccer (Eszterházy, 2006). He played semi-professionally in a minor league; his younger brother was a major league professional and regularly in the national selection. Eszterházy played with his brother after a very long time and he felt like when as a child he got lost at the railway station and ended up standing surrounded by moving trains (ibid: 15). He also mentions an occasion when he had the privilege of playing with Hidegkuti, "the third genius of the Golden Team [or Magical Magyars] besides Puskás and Bozsik" (ibid:

[2] An additional difficulty here is that the Nobel Prize nominations are confidential for 50 years following the nominations. Furthermore, we can see that both in the case of Michelin stars as well as in the case of the Nobel Prize, the award will usually have significant delay compared to achieving the extraordinary level, so it could be expected that often there would be no recognisable difference between the comparison groups.

16, our translation), who was over sixty at the time. These two experiences led him to a deep insight about the nature of extraordinary:

> *"We [i.e. minor league players] think that we are like the great ones, like the major league, only worse. That if we were a little faster, a little more muscular, we would also be… But we know the spirit of the game as well as they do. Not at all. They play a different game 'up there'." (ibid: 15)*

References

Bacon, S. F. (1620/2005). Novum Organum: True Directions Concerning the Interpretation of Nature (e-book ed.). Whitefish, MT: Kessinger Publishing.

Calder, B. J., Phillips, L. W., & Tybout, A. M. (1982). The Concept of External Validity. The Journal of Consumer Research, 9(3), 240-244.

Cousins, J., O'Gorman, K., & Stierand, M. (2010). Molecular Gastronomy: Cuisine Innovation or Modern Day Alchemy? International Journal of Contemporary Hospitality Management, 22(3), 399-415.

Csíkszentmihályi, M. (1997). Creativity: Flow and the Psychology of Discovery and Invention. New York, NY: HarperCollins.

Csíkszentmihályi, M. (2002). Flow: The Psychology of Optimal Experience (2nd ed.). London, UK: Rider.

Denzin, N. K., & Lincoln, Y. S. (2000). Handbook of Qualitative Research (2nd ed.). Thousand Oaks, CA: SAGE Publications.

Dörfler, V., & Ackermann, F. (2012). Understanding Intuition: The Case for Two Forms of Intuition. Management Learning, 43(5), 545–564. DOI: 10.1177/1350507611434686

Dörfler, V., & Eden, C. (2014a). Research on Intuition using Intuition. In M. Sinclair (Ed.), Handbook of Research Methods on Intuition (pp. 264-276). Cheltenham, UK: Edward Elgar Publishing.

Dörfler, V., & Eden, C. (2014b). *Understanding 'Expert' Scientists: Implications for Management and Organization Research*. Paper presented at the AoM 2014: 74th Annual Meeting of the Academy of Management, Philadelphia, PA. https://doi.org/10.5465/AMBPP.2014.10732abstract

Dörfler, V., & Eden, C. (2017). *Becoming a Nobel Laureate: Patterns of a Journey to the Highest Level of Expertise*. Paper presented at the AoM 2017: 77th Annual Meeting of the Academy of Management, Atlanta, GA. http://www.researchgate.net/publication/319373590

Dörfler, V., & Stierand, M. (2009). *Investigating the Extraordinary*. Paper presented at the BAM 2009: 23rd Annual Conference of the British Academy of Management, Brighton.

Eisenhardt, K. M. (1989). Building Theories from Case Study Research. Academy of Management Review, 14(4), 532-550. DOI: 10.2307/258557

Eszterházy, P. (2006). Utazás a tizenhatos mélyére. Budapest, Hungary: Magvető.

Gardner, H. (1993). Creating Minds: An Anatomy of Creativity Seen through the Lives of Freud, Einstein, Picasso, Stravinsky, Eliot, Graham, and Gandhi. New York, NY: Basic Books.

Gardner, H. (1995). Leading Minds: An Anatomy of Leadership. London, UK: Harper Collins Publishers.

Gardner, H. (1997). Extraordinary Minds: Portraits of Exceptional Individuals and an Examination of Our Extraordinariness. London, UK: Phoenix.

Gibbert, M. (2006). Generalizing About Uniqueness: An Essay on an Apparent Paradox in the Resource-Based View. Journal of Management Inquiry, 15(2), 124-134. DOI: 10.1177/1056492606287793

Gibbert, M., Ruigrok, W., & Wicki, B. (2008). What passes as a rigorous case study? Strategic Management Journal, 29(13), 1465-1474. DOI: 10.1002/smj.722

Gladwell, M. (2008). Outliers - The Story of Success. New York, NY: Little, Brown and Company.

Kahneman, D., & Tversky, A. (1972). Subjective Probability: A Judgment of Representativeness. Cognitive Psychology, 3(3), 430-454. DOI: Doi: 10.1016/0010-0285(72)90016-3

Lebuda, I. (2014). Big C Research–The Big Challenge? Reflections from Research into Eminent Creativity in the Light of the Investment Theory of Creativity. Creativity: Theories-Research-Application, 1(1), 33-45. DOI: 10.15290/ctra.2014.01.01.03

March, J. G., Sproull, L. S., & Tamuz, M. (1991). Learning from Samples of One or Fewer. Organization Science, 2(1), 1-13. DOI: 10.1287/orsc.2.1.1

Maslow, A. H. (1966/2002). The Psychology of Science: A Reconnaissance. Chapel Hill, NC: Maurice Bassett Publishing.

Maslow, A. H. (1968). Toward a Psychology of Being (2nd ed.). New York, NY: Van Nostrand Reinhold.

Maslow, A. H. (1970/1994). Religions, Values, and Peak-Experiences. New York, NY: Penguin.

Maslow, A. H. (1971/1993). The Farther Reaches of Human Nature. London, UK: Penguin Compass.

McGrath, J. E., & Brinberg, D. (1983). External Validity and the Research Process: A Comment on the Calder/Lynch Dialogue. Journal of Consumer Research, 10(1), 115-124. DOI: 10.1086/208951

Mill, J. S. (1861). Utilitarianism. In G. Williams (Ed.), Utilitarianism, On Liberty, Considerations on Representative Government, Remarks on Bentham's Philosophy (pp. 1-67). London, UK: Everyman.

Polányi, M. (1962a/2002). Personal Knowledge: Towards a Post-Critical Philosophy. London, UK: Routledge.

Polányi, M. (1962b). Tacit Knowing: Its Bearing on Some Problems of Philosophy. Reviews of Modern Physics, 34(4), 601-616.

Polányi, M. (1966/1983). The Tacit Dimension. Gloucester, MA: Peter Smith.

Scandura, T. A., & Williams, E. A. (2000). Research Methodology in Management: Current Practices, Trends, and Implications for Future Research. Academy of Management Journal, 43(6), 1248-1264. DOI: 10.2307/1556348

Simonton, D. K. (1999). Significant samples: The psychological study of eminent individuals. Psychological Methods, 4(4), 425-451. DOI: 10.1037/1082-989X.4.4.425

Simonton, D. K. (2014). Significant samples—Not significance tests! The often overlooked solution to the replication problem. Psychology of Aesthetics, Creativity, and the Arts, 8(1), 11-12. DOI: 10.1037/a0035849

Stierand, M. (2015). Developing Creativity in Practice: Explorations with World-Renowned Chefs. Management Learning, 46(5), 598-617. DOI: 10.1177/1350507614560302

Stierand, M., & Dörfler, V. (2011). *Revising the Notion of Sample Representativeness*. Paper presented at the BAM 2011: 25th Annual Conference of the British Academy of Management, Birmingham, UK.

Stierand, M., & Dörfler, V. (2012a). *Iterative Learning: A Way of Achieving Generalizability in Idiographic Research?* Paper presented at the BAM 2012: 26th Annual Meeting of the British Academy of Management, Cardiff, UK.

Stierand, M., & Dörfler, V. (2012b). Reflecting on a Phenomenological Study of Creativity and Innovation in Haute Cuisine. International Journal of Contemporary Hospitality Management, 24(6), 946-957. DOI: 10.1108/09596111211247254

Stierand, M., & Dörfler, V. (2013). *Idiographic Explanatory Phenomenology: A Contextualist Approach to Elucidating Experiences*. Paper presented at the BAM 2013: 27th Annual Conference of the British Academy of Management, Aintree Racecourse, Liverpool, UK. https://www.researchgate.net/publication/268925834

Stierand, M., & Dörfler, V. (2016). The Role of Intuition in the Creative Process of Expert Chefs. Journal of Creative Behavior, 50(3), 178–185. DOI: 10.1002/jocb.100

Stierand, M., Dörfler, V., & MacBryde, J. (2014). Creativity and Innovation in Haute Cuisine: Towards a Systemic Model. Creativity and Innovation Management, 23(1), 15-28. DOI: 10.1111/caim.12050

Stierand, M., & Lynch, P. (2008). The Art of Creating Culinary Innovations. Tourism and Hospitality Research, 8(4), 337–350. DOI: 10.1057/thr.2008.28

Taleb, N. N. (2008). The Black Swan: The Impact of the Highly Improbable. London, UK: Penguin Books.

Tversky, A., & Kahneman, D. (1971). Belief in the law of small numbers. Psychological Bulletin, 76(2), 105-110.

Wacker, J. G. (1998). A definition of theory: research guidelines for different theory-building research methods in operations management. Journal of Operations Management, 16(4), 361-385. DOI: 10.1016/S0272-6963(98)00019-9

Weick, K. E. (1989). Theory Construction As Disciplined Imagination. Academy of Management Review, 14(4), 516-531. DOI: 10.5465/AMR.1989.4308376

Weick, K. E. (1995). What Theory is Not, Theorizing Is. Administrative Science Quarterly, 40(3), 385-390. DOI: 10.2307/2393789