

FINDING NEW KINDS OF NEEDLES IN HAYSTACKS: EXPERIMENTATION IN THE COURSE OF ABDUCTION

When I first heard about *Academy of Management Discoveries* (AMD), it was described to me as the “*Psychological Science*” of Management. I was intrigued, but confused. *Psychological Science* is a premier journal in Social Psychology—a discipline largely dominated by experimental projects. At the time, I understood that AMD was primarily aimed at exploring poorly understood phenomena, yet in my mind, experimental projects were less exploratory by design because you can only conduct an experiment if you have a specific focus to start. If you carefully design an experiment *a priori*, then how can an experiment itself be purely exploratory?

Since then, *Discoveries* has honed its focus around publishing articles that employ abductive inquiry—a “process of reasoning from data to an initial hypothesis” (Behfar & Okhuysen, 2018: 1). Now that I have learned more about abductive inquiry, what it is and why it is important, I have come to another realization, namely, that although abductive inquiry might be new to management scholarship, it has long been alive and well within the behavioral sciences, such as Social Psychology. For example, if you open up any Social Psychology journal, you may see articles using experimental methods in one of two different ways—articles with and without hypotheses. That is, there are studies that take a deductive approach and move *from theory to data*—building hypotheses that are later tested (and most typically, confirmed). However, there are also studies that take an abductive approach and move *from data to theory*—often beginning with an intriguing question that cannot be easily answered on the basis of extant theory or research, followed by demonstrating a series of plausible relationships in the data and ending with an effort to provide a broader framework to potentially explain these tentative relationships. If you open up any management journal, the relatively few experimental projects you might find are most often employed to test and confirm theory. Hence, today in Management, there is less focus on this second more exploratory kind of experimental project—a fact that *Discoveries* aims to change.

Accordingly, the goal of this From the Editors (FTE) column is to build upon and extend prior work in the domain of abductive inquiry to help provide prospective AMD authors with guidelines around the kinds of experimental projects that are suitable for AMD. Although there are many excellent articles

aimed at providing a deep discussion of abductive inquiry, and how it differs from deductive and inductive inquiry (Alvesson & Kärreman, 2007; Bamberger, 2018; Behfar & Okhuysen, 2018; Folger & Stein, 2017; Locke, Golden-Biddle, & Feldman, 2008; Shepherd & Sutcliffe, 2011), this FTE does not focus on these distinctions. Instead, this article focuses squarely on experimental projects as opposed to other methods. For this FTE, experimental projects are defined as studies conducted in the laboratory, field, or online, which randomly assign participants to a given treatment condition.

Importantly though, abductive inquiry itself does not prioritize one methodology over another and instead is quite agnostic with respect to methodology. Likewise, AMD does not prioritize one methodology over another and encourages all kinds of methods—as long as they are used in the pursuit of abductive inquiry. Indeed, Behfar and Okhuysen (2018) note that abductive inquiry is not determined by the methodology used, but rather, the methods used should help the scholars achieve the aims of engaging in abductive inquiry. As such, I aim to provide guidance to prospective AMD authors about instances when employing experimental methodology might have an advantage over other methods in the course of abductive inquiry, followed by guidelines around the kinds of experimental projects that are suitable for AMD and those that are not.

WHEN TO CHOOSE AN EXPERIMENTAL METHOD IN THE COURSE OF ABDUCTIVE INQUIRY

One of the most powerful benefits of employing an experimental approach in the course of conducting Management research, generally, is that experiments offer tremendous precision and specificity. That is, to design an effective manipulation, you need to precisely define the phenomenon of interest—which allows you a greater degree of internal validity than other methodological approaches. For example, experiments allow the experimenter to show that an independent variable has causal priority relative to the dependent variable or outcome. Demonstrating that a manipulation temporally precedes an outcome can help rule out the possibility that the outcome caused the manipulation. Second, experimental projects allow experimenters to randomly assign participants to a given treatment or manipulation;

this effectively diminishes the likelihood that some unmeasured or third variable can explain the relationship between the manipulation and outcome. Third, experiments allow experimenters to show that a specific manipulation covaries with a specific outcome. All three conditions, causal priority, elimination of third variables, and covariation between cause and effect, are what Cook and Campbell (1979) identified as key to establishing that one variable likely caused another. Hence, it follows that one major role experimental projects can play in the course of conducting abductive inquiry is allowing researchers to show causality between a manipulation and dependent variable to clarify, surface, or reveal new phenomenon—and thereby find new kinds of needles in haystacks.

Because the field of Management is inclusive of a wide range of methods and paradigms, it can be difficult to know which method is best suited to the needs of a given research project. Hence, in the context of Management research where there are many methodological options available to the researcher, the question remains when employing an experimental methodology might make an especially strong empirical case in the course of an abductive inquiry. This question is especially important to address when considering that the goal of abductive inquiry is to inform down-the-road theorizing on the basis of empirical observation, which in turn necessitates that data are of high quality. Even beyond the quality of the data, the *nature* of the data also influences the kind of inferences scholars can make regarding down-the-road theorizing. Miller and Bamberger (2016) noted that the criterion for choosing a particular data sample should be based on the researchers' hunch about where the likely explanation for an empirical puzzle might reside. Similarly, the criterion for choosing a particular methodology might also stem from the researchers' hunch about the nature of the phenomena under inquiry, and/or the underlying reason why prior research efforts have failed to surface or explain it.

If one major advantage of an experimental approach is to enhance control and precision, then it follows that there are at least two (and potentially many more than two) instances when employing an experimental methodology could prove especially valuable in the course of engaging in abductive inquiry. In my view, when it comes to engaging in abductive inquiry, experimental projects are especially helpful to employ when needing to (1) surface emergent or poorly understood phenomena using a more precise operationalization than used in prior research, or (2) surface relationships that are surprising because the authors can more precisely rule out known and expected alternative theoretical

frameworks. To demonstrate how experimental projects can achieve these aims, I will draw from the increasing numbers of experimental projects published in *AMD* for examples of each approach.

Surfacing a puzzling phenomenon via a more precise operationalization than that used in prior research: Sometimes, the phenomenon of interest needs to be carved out and isolated to help tell a new story. Indeed, this is what Salmon, Gelfand, Ting, Kraus, and Fulmer (2016) showed when they examined whether Americans were more impatient, and so more likely to lose out on negotiation gains relative to other cultures. The authors acknowledged that prior work had examined cultural differences in beliefs about time and negotiation outcomes, but noted that the unique contribution of their study was a more precise operationalization of the perception of time than used in prior studies. Furthermore, the authors argued that this more direct measure of the experience of time itself allowed them to unveil or surface a puzzling relationship between culture and impatience—that had not been identified previously.

Loewenstein and Mueller (2016) also employed an experimental methodology to surface a surprising phenomenon around creativity assessments. The authors had a hunch that implicit theories of creativity (lay theories around the cues that indicate creativity) might differ from explicit theories of creativity (scholarly theories around the cues that indicate creativity). To explore this phenomenon, the authors conducted a qualitative inductive study to flesh out all the different cues participants in the United States and China believed were important to creativity, identifying a surprising lack of overlap between implicit and explicit theories of creative ideas. For example, 95 percent of Chinese and 30 percent of Americans believed the cue “mass market” indicated an idea was creative, even though this cue was not included in the conceptual definition of creativity employed by scholars. But through an experimental approach, the authors identified that perceptions of creativity could shift merely by exposing study participants to a single cue. For example, the authors found that Chinese rated a watch that was for a mass market as *more* creative than a watch that was not for a mass market, whereas Americans rated a watch that was for a mass market as *less* creative than a watch that was not for a mass market. Hence, by using an experimental methodology, Loewenstein and Mueller were able to demonstrate that participants relied on their own implicit (rather than explicit) theories of creativity. Furthermore, the authors were able to show that culture shaped creativity assessments in ways not anticipated by prior theory.

Surfacing surprising relationships but ruling out extant theoretical mechanisms in a precise way: For many research questions, theory may clearly exist to explain a proposed relationship between two variables. In this case, the question of whether an experimental project is deductive or abductive involves whether there is a case to be made that the relationships examined in the research are explained by existing theory or not. For example, Pfeffer and Carney (2018) had a hunch that people would experience higher levels of stress when thinking about “time as money.” This relationship might not seem surprising if explained by low socioeconomic status (SES) or other variables indicating resource scarcity. Indeed, the appraisal theory of stress would suggest that people in financial difficulty would indeed feel more stressed if primed with thoughts such as “time is money,” which may make their actual resource scarcity more salient. However, the relationship between the perception of “time as money” and stress certainly would be surprising if it occurred for reasons *beyond* what existing theory would propose. Indeed, this is why Pfeffer and Carney employed an experimental method, which through random assignment, effectively accounts for the possibility that one treatment condition might contain participants with higher SES, or other potential third variables, relative to the other. Furthermore, Pfeffer and Carney employed two experiments to narrow down the range of alternative explanations to find that, surprisingly, thinking of “time as money” contributed to stress because it diminished psychological attachment to the job and perceived meaning of the work. Critically though, the authors’ objective in employing an experimental method was not just to rule out extant theoretical explanations but to isolate some alternative plausible explanation as well.

It is important to note that Pfeffer and Carney could have employed a field study to assess the relationship between “time as money” and stress. One might immediately assume that testing this association in a field context is always superior as it affords enhanced external validity whereas an experiment does not. For example, the authors could have examined employee self-reports of time as money and correlated these with negative mood, morbidity, cortisol levels over time, or other known correlates of stress. However, this kind of a field study design would not have allowed the authors to show that thinking about “time as money” *caused* elevated cortisol levels for reasons unaccounted for by existing theory (e.g., appraisal theory of stress). Said differently, because a field study design does not allow for random assignment to conditions, nor a demonstration of causal priority, it could not have allowed the authors to rule out the possibility that the

appraisal theory of stress (e.g.) might explain their findings. Furthermore, a single field study would not have allowed the authors to narrow down the range of alternative explanations *or* isolate alternative plausible explanations—both of which are critical for drawing inferences on the basis of abduction (Bamberger, 2018). Hence, for Pfeffer and Carney, an experimental methodology allowed a better fit to the aims of abductive inquiry relative to a field study as the experimental method provided stronger evidence that the association they were examining was not explained by the existing theory. In sum, experimental methods provide an especially important tool to use in the course of abductive inquiry as they allow researchers to unveil that relationships are surprising because they occur for reasons beyond what existing theory would propose.

SUITABILITY OF EXPERIMENTAL PROJECTS FOR PUBLICATION IN *AMD*

Now that I have discussed the key role experimental projects can take in the course of abductive inquiry, it might be helpful to specify the kinds of experimental projects that may or may *not* be suitable for publication in *Academy of Management Discoveries*. Starting with the latter, in general, experiments designed to test existing theory (e.g., experiments with hypotheses) are *not* suitable for *AMD*. In other words, if an argument can be made that an experiment offers findings which are easily explained by an existing theoretical paradigm, the experimental project is probably not suitable for *AMD*. This means that in the case that there is a clear theoretical paradigm that can explain results, the study is probably better suited to publish in a more traditional management journal unless the authors provide evidence that this paradigm cannot account for the current findings. There are also instances where studies are neither suitable for *AMD* nor a more traditional management journal—such as when the phenomenon of interest is not clearly related to Management or when the manipulation is conceptually fuzzy and so offers many competing explanations as to whether the relationship is real, and what drives it.

So the question remains, what kinds of experimental projects *are* suitable for *AMD*? In general, *AMD* encourages experiments in the service of discovery or theory building from data rather than theory testing. Beyond meeting the criterion for empirically driven theory development (as opposed to testing), there are no other criterion that differentiate when an experimental project is suitable for publication in *Discoveries*. Said differently, if the experimental project offers rigorous data suggesting

patterns not easily explained on the basis of existing theory, as well as analyses which narrow the range of alternative explanations in a way that facilitates down-the-road theorizing,—it is likely suitable for *AMD*.

There is one exception to the rule regarding the exclusion of theory testing (e.g., employing hypotheses) in the course of abductive inquiry. Indeed, for *AMD*, it is reasonable to test theory if the aim is to demonstrate the null (i.e., suggest theory disconfirmation as a means by which to narrow the range of plausible explanations). For example, Silberzahn and Menges (2016) examined facial masculinity and leadership preferences. Building from implicit leadership theory and biosocial model of leadership, they asserted that in competitive contexts, high facial masculinity for men and women should positively impact leadership perceptions, whereas low facial masculinity would negatively impact leadership perceptions. Although the authors did not explicitly hypothesize these relationships in the article, they did explicitly test these relationships but surprisingly disconfirmed them for women. Indeed, contrary to theory, women with high and low facial masculinity were seen as more leader-like in highly competitive contexts. The authors then proceeded to narrow down the range of alternative explanations by replicating the results using a different experimental methodology, and in a third study with pictures of CEOs.

In his FTE, Bamberger (2018) noted that abductive inquiry can offer only weak or plausible evidence relative to deductive inquiry which offers strong evidence. Because in the course of abductive inquiry, we can only say that the evidence we provide is preliminary or suggestive, does it then follow that we should apply a lower standard to the quality of the data collected? The answer to this question is emphatically, “no.” Indeed, one could even argue that the bar for methodological rigor is *higher* with respect to experiments in the service of abduction precisely because these experiments are not guided by *a priori* hypotheses. Rigor and replication are required to ensure that observed patterns are not merely statistical artifacts. Accordingly, articles published in top-tier psychology journals (regardless of whether or not they test theory) may be used as basis of comparison when deciding if your project is suitable for and meets the methodological rigor demanded by *AMD*. The only corollary to this point is that, although *AMD*, like most Social Psychology journals, encourages authors to examine the mechanisms potentially underlying identified relationships, *AMD* does not require authors to do so. Authors of experimental studies should strive toward offering one or two supplementary studies aimed, at the very least, at trying to rule out and thus

narrow the range of potential mechanisms. However, *AMD* is still open to studies offering only limited insight into the mechanisms driving the patterns observed [e.g., the article by Doyle, Lount, Wilk, and Pettit (2016)]. Such articles, often published as short reports called “Discoveries-in-Brief,” should still, nevertheless, provide an extended discussion section aimed at fleshing out potential mechanisms and boundary conditions for future studies to take into account.

Importantly, because *AMD* is phenomenon driven, the experimental manipulations and dependent measures should have a high degree of mundane realism—that is some corollary to an actual situation relevant to Management (Colquitt, 2008). Experimental and quasi-experimental studies conducted in the field are ideal and offer the best of both worlds; however, laboratory experiments offer heightened internal validity and precision. That said, *AMD* has published studies that only include laboratory experiments under the assumption that the experiments have mundane realism, and that they address a phenomena of interest to the management community.

HOW DOES ONE GO ABOUT WRITING UP AN EXPERIMENTAL PROJECT FOR *AMD*?

Given this, one might ask how to go about designing and writing up an experimental study for *AMD*? First, instead of starting the article by proposing a set of *a priori* hypotheses, researchers might pose a research question fueled by the identification of discrepant findings or a conceptual puzzle with significant theoretical and/or practical importance. For example, Doyle et al. (2016) asked whether the consideration of status distance—the magnitude of status difference between two people—might help reconcile prior work which has found a positive and also negative relationship between help giving and status of the help receiver. To substantiate that status distance was important, they reviewed the extant literature on status distance to demonstrate that extant theory is unable to explain how status distance might relate to helping and that status distance might better reflect reality as people experience status relationally (i.e., by comparing others to themselves). In sum, the authors posed a research question that current theory could not adequately answer and then offered a compelling justification for their inquiry, suggesting that relative to extant conceptualizations of status, relational comparisons might better reflect people’s psychological experience of status.

Second, after proposing an important research question, *AMD* experimental articles typically offer multiple experiments or studies, with each building

upon the one before it while still tackling a different aspect of the central inquiry. For example, Doyle et al. (2016) broke their examination of the relationship between status distance and helping into two manageable steps. First, the authors employed an experiment to (1) test a causal association between status distance and helping and to (2) clearly refine their notions of status distance and helping. This initial study was also designed to help them narrow down the range of alternative explanations. More specifically, the experiment was designed to be able to demonstrate that any relationship between status distance and helping could not be attributed to individual differences (because of random assignment), or other kinds of differences between dyad members such as differences in gender or relationship quality (because the scenario was fictitious and so these differences were held constant across conditions). Hence, the choice to begin their exploration with an experiment helped them operationalize the phenomenon in a precise way and aided in their ability to show that this newly surfaced relationship occurred irrespective of other potential third variables such as personality differences. Importantly, the authors then replicated the finding in a second, field study. This study also allowed them to demonstrate that the finding had external validity and was not an artifact of the experimental design used in Study 1. In sum, the authors broke their examination into manageable steps, with each study offering incremental insight and narrowing the range of alternative explanations.

The final step of writing an article for *AMD* is perhaps the most impactful for future work: write a general discussion section summarizing and integrating the observations from all of the experiments reported. It is worthwhile to note that an *AMD* discussion section departs dramatically from what you might write for a *Social Psychology* or traditional management journal. In a more traditional discussion section, the author fleshes out the theoretical and practical implications of the model tested and limitations of the present study that future researchers might incrementally improve on. By contrast, at *AMD*, the goal of the Discussion section is to pinpoint a “discovery” which departs from extant theory and points to a new framework aimed at guiding future hypothesis testing. For example, in their 2016 *AMD*, Loewenstein and Mueller discovered a model of implicit theories of creative ideas which served as the theoretical foundation for a study they later published in *AMJ* that confirmed these associations to develop a social context model of creativity assessments (Mueller, Melwani, Loewenstein, & Deal, 2018). Because *AMD* articles are abductive in nature and so not guided by extant

theory, the data are expected to narrow down the range of alternative explanation but not necessarily to unveil new potential mechanisms. Indeed, Doyle et al. (2016) did not offer a mechanism to explain the relationship between status distance and helping behavior; however, in their discussion section, they did offer a roadmap to guide future efforts to uncover likely mechanisms. In sum, discussion sections at *AMD* are intended to guide the tweaking of extant theory and/or the development of new theory, and so provide a starting point for later stage deductive approaches that allow for theory testing.

CONCLUSION

AMD encourages the use of experimental methodology in the course of abductive inquiry. When engaged in abductive inquiry, experimental methods—by allowing researchers to more precisely define and manipulate variables in a controlled setting—can facilitate the surfacing of new phenomena and relationships, demonstrate the nature of causal linkages between the phenomena of interest, and rule out extant theoretical explanations. Furthermore, multiple experiments can replicate findings and narrow down the range of alternative explanations and also offer plausible alternative explanations not accounted for by extant theorizing. Pairing experiments with other kinds of methods can provide an especially powerful combination because each methodology can compensate for the weakness of the other. For all these reasons, inferences drawn from experimental results can serve as an important basis for down-the-road theorizing, offering critical, empirically grounded criteria to guide enhanced theory development.

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REFERENCES

- Alvesson, M., & Kärreman, D. 2007. Constructing mystery: Empirical matters in theory development. *Academy of Management Review*, 32: 1265–1281.
- Bamberger, P. A. 2018. AMD—Clarifying what we are about and where we are going. *Academy of Management Discoveries*, 4: 1–10.
- Behfar, K., & Okhuysen, G. A. 2018. Perspective—Discovery within validation logic: Deliberately surfacing, complementing, and substituting abductive reasoning in hypothetico-deductive inquiry. *Organization Science*, 29: 323–340.

- Colquitt, J. A. 2008. From the editors publishing laboratory research in AMJ: A question of when, not if. *Academy of Management Journal*, 51: 616–620.
- Cook, T. D., & Campbell, D. T. 1979. The design and conduct of true experiments and quasi-experiments in field settings. In R. T. Mowday & R. M. Steers (Eds.), *Reproduced in part in research in organizations: Issues and controversies*. Santa Monica, CA: Good-year Publishing Company.
- Doyle, S. P., Lount, R. B., Wilk, S. L., & Pettit, N. C. 2016. Helping others most when they are not too close: Status distance as a determinant of interpersonal helping in organizations. *Academy of Management Discoveries*, 2: 155–174.
- Folger, R., & Stein, C. 2017. Abduction 101: Reasoning processes to aid discovery. *Human Resource Management Review*, 27: 306–315.
- Locke, K., Golden-Biddle, K., & Feldman, M. S. 2008. Perspective—Making doubt generative: Rethinking the role of doubt in the research process. *Organization Science*, 19: 907–918.
- Loewenstein, J., & Mueller, J. 2016. Implicit theories of creative ideas: How culture guides creativity assessments. *Academy of Management Discoveries*, 2: 320–348.
- Miller, C. C., & Bamberger, P. 2016. Exploring emergent and poorly understood phenomena in the strangest of places: The footprint of discovery in replications, meta-analyses, and null findings. *Academy of Management Discoveries*, 2: 313–319.
- Mueller, J. S., Melwani, S., Loewenstein, J., & Deal, J. 2018. Reframing the decision-makers' dilemma: Towards social context model of creative idea recognition. *Academy of Management Journal*, 61(1): 1–17.
- Pfeffer, J., & Carney, D. R. 2018. The economic evaluation of time can cause stress. *Academy of Management Discoveries*, 4: 74–93.
- Salmon, E. D., Gelfand, M. J., Ting, H., Kraus, S., & Fulmer, C. A. 2016. When time is not money: Why Americans may lose out at the negotiation table. *Academy of Management Discoveries*, 2: 349–367.
- Shepherd, D. A., & Sutcliffe, K. M. 2011. Inductive top-down theorizing: A source of new theories of organization. *Academy of Management Review*, 36: 361–380.
- Silberzahn, R., & Menges, J. 2016. Reading the face of a leader: Women with low facial masculinity are perceived as competitive. *Academy of Management Discoveries*, 2: 272–289.