

# A R T I C L E

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## IMPROVING MANAGEMENT THEORY AND POLICY-MAKING THROUGH INNOVATIVE METHODS AND DATA

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**Methods and data innovations have served as catalysts for theory advancement and policy-making throughout the evolution of management and many other fields. However, new methods take a long time to be diffused and adopted. The most common contemporary methods used in management research are similar to those used decades ago. Drawing upon theories of knowledge diffusion and adoption, we identify four barriers to the slow propagation of methodological innovations: (a) insufficient knowledge or skills, (b) inadequate adoption of technology, (c) outdated norms, and (d) inefficient incentives as well as inapplicable journal and professional organization policies. Then, to show the usefulness of the four-barrier framework for understanding slow diffusion and adoption, we focus on three selective methods and data innovations: Collection of Web-based (aka big) data, utilization of video-based methods, and use of computer-aided text analysis techniques. Our aim is not to create a “gold rush” for new methods or accelerate methodological and theoretical speed for their own sake, but to expand our collective methodological toolkit to develop and test more robust, replicable, accurate, predictive, and credible theory that will result in better-informed and more effective policy-making.**

Methods and data have been catalysts for theory advancement and policy-making throughout the evolution of management and many other fields (Bergh, Boyd, Byron, Gove, & Ketchen, 2022). For example, advances in video-based methods, multilevel modeling (Eckardt, Yammarino, Dionne, & Spain, 2021), and big data have revolutionized how theory can be built and tested, leading to useful policy implications (Christianson, 2018; LeBaron, Jarzabkowski, Pratt, & Fetzer, 2018). Despite their usefulness and

critical role in accelerating important theory advancements leading to better-informed policies, new methods take a long time to be known and adopted (Le & Schmid, 2022). Several reviews have documented that the most commonly used methods in management research (e.g., questionnaires) are similar to those that were already in use decades ago (Aguinis, Pierce, Bosco, & Muslin, 2009; Bainbridge, Sanders, Cogin, & Lin, 2017; Hill, Johnson, Greco, O’Boyle, & Walter, 2021). The following statement by Aguinis et al. (2009: 75) seems just as relevant today: “because change in patterns of methods use is so slow, the modal design, measurement, and analysis characteristics of an article today have not changed much compared to an article published about 20 years ago.” This is unfortunate, because slow methodological diffusion translates into slow theory advancement and policy-making improvements (cf. Van Maanen, Sørensen, & Mitchell, 2007).

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Our article explains that adopting innovative methodology can result in more robust, replicable, accurate, predictive, and credible theory development and testing, which is critical for producing useful policies. Specifically, credible theory development and testing are needed to guide principles that drive management stakeholders' choices, behaviors, and courses of action (Markman & Wood, 2022). However, we do not advocate for a "methods fetish" or a "methodological gold rush" (Suddaby, 2014; Tourish, 2020) but, instead, for complementary methodologies that help existing methods triangulate on phenomena of interest. Through this approach, science can advance and become more robust, and is more likely to replicate and result in better-informed and more effective policy-making.

To accomplish our goal, we draw upon the literature on weakening barriers to knowledge diffusion and adoption (Ghoshal & Bartlett, 1988; Meyer & Goes, 1988; Rogers, 2010; Valente, 1996). We also rely on theories from the medical literature on adherence, as well as organizational theories on innovation (Crawford, Espie, Bartlett, & Grunstein, 2014; Greenhalgh, Robert, Macfarlane, Bate, Kyriakidou, & Peacock, 2005). Collectively, this framework provides us with guidance on removing barriers to diffusion and adoption in general, which we apply to the specific context of research methodology. Specifically, we discuss how to overcome the following barriers: (a) insufficient knowledge or skills, (b) inadequate adoption of technology, (3) outdated norms, and (d) inefficient incentives as well as inapplicable journal and professional organization policies. To show the usefulness and applicability of our framework to understanding barriers to methodological diffusion and adoption, we discuss three selective methodological innovations: collection of Web-based (aka big) data, utilization of video-based methods, and use of computer-aided text analysis (CATA) techniques. We describe each innovation, how these innovations can result in theoretical advancements and policy implications, and offer solutions for overcoming relevant barriers.

In sum, we make three main contributions. First, we apply diffusion of innovation theory in a novel way and describe barriers to methodological diffusion and innovation. Second, we describe three specific methods and data innovations and how they can be used to build and test theory and produce policies across micro and macro domains. Third, we offer solutions for minimizing barriers to methodological innovations in the future. The barriers and solutions described in the current article represent a conceptual extension of diffusion of innovation

theory and a template for the diffusion and adoption of other innovations.

## THEORETICAL FRAMEWORK: BARRIERS TO DIFFUSION AND ADOPTION OF INNOVATIONS

We address four main barriers. These barriers disrupt the *diffusion* of methodological innovations and the *adoption* of methodological innovations. They include insufficient knowledge or skills (Barrier 1), inadequate adoption of technology (Barrier 2), outdated norms (Barrier 3), and inefficient incentives as well as inapplicable journal and professional organization policies (Barrier 4). These barriers originate mainly from the medical literature on barriers to evidence-based practice (Crawford et al., 2014; Greenhalgh et al., 2005) as well as literature on the diffusion of innovation, especially through social networks (Ghoshal & Bartlett, 1988; Meyer & Goes, 1988; Rogers, 2010; Valente, 1996). We integrate these two streams of literature and apply them to the specific context of methods and data innovations. As a preview, we summarize these barriers in Table 1.

### Barrier 1: Insufficient Knowledge or Skills

One barrier pertains to the extent to which knowledge of methodological innovations is not disseminated (Lichtenthaler, 2011). When methodological innovations are initially made, it takes time to disseminate knowledge that might disrupt existing paradigms (Greenhalgh et al., 2005, 2017). For example, many articles published in methodological journals such as *Organizational Research Methods* and *Psychological Methods* include highly technical information that is not accessible to nonmethodologists. In other words, many articles describing new methods are often technical and not written in a way that makes content accessible to researchers who have received typical methodological training in the field of management. This is a consistent concern according to diffusion of innovation theory (Rogers, 2010). The first step in the diffusion of innovation theory is the creation of the innovation itself. However, making the innovation accessible and easy to use is also a critical step in the process.

Also related to the accessibility of knowledge, management researchers in emerging countries do not work for universities with budgets that allow them to access subscription-based databases and journals (Aguinis, Villamor, Lazzarini, Vassolo, Amorós, & Allen, 2020). So, insufficient access to knowledge is also the result of a lack of financial resources to pay

**TABLE 1**  
**Barriers to Diffusion and Adoption of Innovative Methods and Data**

Barriers	Description	Examples
1. Insufficient knowledge or skills	The extent to which knowledge of methodological innovations is not disseminated, or is diluted in the mass of information available	<ul style="list-style-type: none"> <li>■ Articles describing new methods are published in journals that are specialized, highly technical, and often not accessible to nonmethodologists</li> <li>■ Lack of access to subscription-based databases and journals</li> <li>■ Insufficient doctoral training in methodological innovations</li> </ul>
2. Inadequate adoption of technology	The extent to which needed tools and technology are absent	<ul style="list-style-type: none"> <li>■ Insufficient accessibility of software packages</li> <li>■ Insufficient access to technology such as wearable sensors, virtual reality, and gamification</li> <li>■ Insufficient interdisciplinary collaborations</li> <li>■ Lack of large-scale collaborations means competition for scarce resources</li> </ul>
3. Outdated norms	The extent to which existing norms in a social network (i.e. accepted standards of conduct) prevent the adoption of methodological innovations	<ul style="list-style-type: none"> <li>■ Many innovations are seen as originating in external groups and “not-invented-here”</li> <li>■ Focusing on specific practices about reporting measures’ properties (e.g., Cronbach’s alpha)</li> <li>■ Dominance of the hypothetico-deductive approach</li> <li>■ Practice of reporting statistical significance exclusively and not practical significance</li> </ul>
4. Inefficient incentives as well as inapplicable journal and professional organization policies	The extent to which incentives and policies from journals and professional organizations needed to motivate the adoption of innovative methods are absent, or disincentives are present (e.g., inapplicable policies)	<ul style="list-style-type: none"> <li>■ Researchers consider how difficult the innovation will be to implement relative to how much value-add the innovation might have for accelerating the advancement of theory—and the chances of a positive publication outcome</li> <li>■ Methodological innovations that are not easily recognized by reviewers unfamiliar with those innovations</li> <li>■ A failure to recognize the competitive advantages bestowed by innovations on the part of authors</li> <li>■ Rules and requirements regarding the manuscript submission process (e.g., insufficient requirements about transparency, insufficient policies about data sharing practices)</li> </ul>

for subscriptions to journals devoted to methodological advancements. According to the current Carnegie Classification (2023), there are 3,939 institutions indexed. Of these, only 146 are indexed as *Very Highly Research Activity* (R1). This may indicate that other institutions do not have the same level of access to journals and databases, among other resources.

Related to the issue of insufficient financial resources, many business school deans are reducing the number of methods-related seminars offered to doctoral students. From the perspective of many business school deans focused only on the short-term, asking a tenured professor to teach a handful of nonpaying doctoral students does not seem to be nearly as financially profitable as teaching dozens of paying undergraduate or master’s students. Aguinis and Cronin (2023: 15) suggested,

Even if deans want to support theory advancements, they may balk at putting a full professor in a classroom with four non-paying Ph.D. students versus 40

paying MBAs or undergraduate students. So, deans looking out for their interests and short-term career goals, as opposed to the long-term sustainability of a business school as a generator of useful and usable knowledge, choose to reduce the number of doctoral courses. This is particularly problematic given that there is an increasing number of sophisticated methods and theories to learn, so more training is needed.

The net result of such decisions is that doctoral students may be exposed to fewer and fewer seminars addressing methodology.

### **Barrier 2: Inadequate Adoption of Technology**

Another barrier is the extent to which needed tools and technology are absent. For instance, tools such as Web-scraping machine-learning algorithms serve to advance theory building and testing, as well as evidence-based practice (Landers, Brusso, Cavanaugh, & Collmus, 2016; Wang, Tian, Yazar, Ones, & Landers, 2022). However, similar to

insufficient accessibility of knowledge or skills, methodological tools take time to become accessible (Rogers, 2010). This is a critical element of the diffusion of innovation theory. Classic examples from recent decades include the availability of computers and the Internet (Nosek & Bar-Anan, 2012). More recently, this might include the accessibility of software packages. Specifically, certain software packages are difficult to access because they are proprietary and expensive (e.g., SPSS and SAS). Others are open access but more computationally challenging (e.g., R and Python), meaning that many management researchers do not yet use them. However, these software packages have not been fully utilized because they require greater expertise (although generative AI platforms are now able to generate code for statistical analysis in several languages). Examples of additional technologically intensive methodological tools include wearable sensors (Matusik, Heidl, Hollenbeck, Yu, Lee, & Howe, 2019), virtual reality (Hubbard & Aguinis, 2023), and gamification (Landers, Auer, Collmus, & Armstrong, 2018). These methodological tools can be used both in observational studies as well as in experimental and quasi-experimental designs. Insufficient access to tools and technology is also due to a lack of cross-disciplinary collaborations with researchers in other fields, and a lack of large-scale collaborations, leading to competition for scarce resources. A lack of interdisciplinary collaborations can slow the diffusion of innovations between early adopters and those with less experience (Rogers, 2010). Competition can be detrimental to the advancement of theory and policy-making if it results in little collaboration, and competition can be fierce in scientific research (Fang & Casadevall, 2015).

### Barrier 3: Outdated Norms

As a third barrier, consider the role of outdated norms. Outdated norms can be characterized as the extent to which existing norms in a social network (i.e., accepted standards of conduct) prevent the adoption of methodological innovations. Norms can also play a role in facilitating or preventing the facilitation of methodological innovations (Rogers, 2010). A critical threshold must be reached in one's social network for new behaviors to become normative (Valente, 1996). Norms are characterized as standard patterns within groups or organizations, and can be powerful drivers of adopting methodological innovations or be serious challenges to their use (Ghoshal & Bartlett, 1988; Meyer & Goes, 1988). Consequently, innovations originating in external groups, and those

“not invented here” may see slower adoption (Antons & Piller, 2015).

In the context of methodological innovations, an example includes the norm to report measures' psychometric properties, such as reliability coefficients focusing only on coefficient  $\alpha$ . The challenge is advancing outdated norms once established, such as replacing the reporting of coefficient  $\alpha$  with  $\omega$  (Cortina et al., 2020; McNeish, 2018). As a second example, in management research there are normative pressures to use the hypothetico-deductive method to advance theory, and such a norm has perhaps prevented the advancement of other types of theorizing (Hambrick, 2007a). Reviewers may be less receptive to inductive or abductive approaches due to outdated norms that serve as the barrier in this case (Bamberger & Ang, 2016; Sætre & Van de Ven, 2021). For instance, Locke (2007: 867) wrote:

Everyone who publishes in professional journals in the social sciences knows that you are supposed to start your article with a theory, then make deductions from it, then test it, and then revise the theory ... . In practice, however, I believe that this policy encourages—in fact demands, premature theorizing and often leads to making up hypotheses after the fact—contrary to the intent of hypothetico–deductive method.

Locke (2007: 878) further added, “Of course, journal editors compelled us to list formal hypotheses, but in our own minds we were less formal and more just questioning.” This illustrates how outdated norms might hinder the adoption of innovative ways to build and test theory.

As another illustration of how norms serve as barriers to adopting methodological innovations, Cohen (1990) noted, more than three decades ago, the problem of norms focused on statistical significance at the expense of practical significance. That is, a norm of emphasis on statistical significance at the expense of computing and reporting other complementary but important metrics, such as effect-size estimates, can harm the advancement of theory and policy-making (Antonakis, 2017). The literature is replete with examples of how the absence of tools and technology and social network norms have prevented the diffusion and adoption of new methods and data (cf. Lance & Vandenberg, 2009; 2015).

### Barrier 4: Inefficient Incentives as Well as Inapplicable Journal and Professional Organization Policies

The final barrier is the extent to which incentives and policies from journals and professional organizations needed to motivate the adoption of innovative

methods are absent, or disincentives are present (e.g., inapplicable policies). That is, consumers of innovations adopt such innovations at varying rates. After innovators and early adopters, a critical mass of individuals may begin to adopt the innovation, but there can be laggards who are slower to adopt (Rogers, 2010). Motivation theory suggests that the decisions to adopt innovative methods and data are likely based on evaluating perceived costs relative to expected benefits (Aguinis, Banks, Rogelberg, & Cascio, 2020). That is, researchers consider how hard the innovation will be to implement relative to how much value-add the innovation might have for accelerating the advancement of theory—and the chances of a positive publication outcome.

Consider the following examples. First, methodological innovations not easily recognized by journal reviewers may result in a lukewarm or hostile reception in the review process (Antons & Piller, 2015). Hence, researchers are less likely to adopt an innovative methodology, fearing that this may result in the rejection of their submitted manuscript. Second, if researchers fail to recognize the competitive advantages bestowed by innovations, they will not be motivated to adopt those innovations. This is related to the first barrier—insufficient knowledge and skills regarding the potential of the innovative approach to contribute significantly to theory and policy-making.

Third, consider the role of policies from journals and professional organizations needed to potentially mandate engagement in methodological innovations (Rogers, 2010). As described earlier, norms represent accepted standards. On the other hand, policies are governance principles that guide the choices, behaviors, and courses of action of individuals, organizations, communities, and societies (Markman & Wood, 2022). While norms may be sufficient to encourage most individuals to adopt an innovation or advancement, policies are needed to ensure compliance when harm can be done by a failure to comply. While certain innovations are adopted quickly, others might be slower or not adopted at all (Greenhalgh et al., 2005). As an example of methodological innovations, consider advancements in open science that took decades to implement (Rosenthal, 1979). Many have now called for greater transparency (Aguinis, Ramani, & Alabduljader, 2018), and we have begun to see journals implement policies that promote and sometimes require greater transparency (e.g., Banks, Woznyj, Wesslen, & Ross, 2018). These policies can be extended to transparent reporting in other areas, such as reporting standards for meta-analysis (DeSimone,

Brannick, O'Boyle, & Ryu, 2021), or reporting intellectual credit in the form of authorship (Rasmussen, Hausfield, Williams, Banks, & Davis, 2020).

In the next section, we apply the four-barrier framework to the diffusion and adoption of three illustrative methodological innovations. Then, we summarize each innovation, describe theory advancements that can take place, and pose specific questions that can be answered by implementing each innovation—and resulting policy implications. Later in our article, we offer solutions for overcoming each barrier in future research. Finally, we wish to clarify that the methodological innovations are not illustrative of the barriers or the solutions. Instead, these barriers exist and slow the diffusion and adoption of the innovations. Consequently, the proposed solutions discussed in the final section allow individual scholars and institutions to reduce or remove relevant barriers.

A major methodological innovation can be characterized as a practice that substantially influences scholarship to a great extent and applies to a broad audience of researchers (Bergh et al., 2022). To identify contemporary methodological innovations, we reviewed all articles published in *Organizational Research Methods* and *Psychological Methods* over the past 20 years. Then, we used the following criteria to select innovative methodological approaches: (a) not yet widely used by management researchers, (b) generally applicable across management domains and theories (e.g., micro and macro), and (c) practical to use.

## METHODOLOGICAL INNOVATION 1: WEB-BASED (AKA BIG) DATA

### Description

In the Internet age, we now have access to a seemingly limitless amount of data that can be described by the commonly used three Vs: volume, velocity, and variety (George, Haas, & Pentland, 2014). First, the sheer size of data sets has increased exponentially (volume). Second, the speed at which data can be accessed has also accelerated (velocity). Third, the extent of data types has also significantly changed (variety). However, even if one does not operate in a field where big data are common, access to Web-based data has increased access to volume, velocity, and variety. For instance, Web-based data provide access to previously difficult-to-research populations (variety). Hence, one of the most powerful methodological innovations of the last twentieth century and early twenty-first century is the availability of

Web-based data. Unfortunately, while these types of data are not uncommon, they remain underutilized (Oswald, Behrend, Putka, & Sinar, 2020).

There are several overarching ways in which Web-based data can be accessed. First, publicly accessible data might be made available through Web-scraping websites via appropriate channels (Landers et al., 2016). This is a common way to obtain text. One can also acquire audio and visual data through videos and images. Second, one might use online platforms to solicit participants to take surveys or complete other tasks (Porter, Outlaw, Gale, & Cho, 2019). One of the most popular such platforms is Amazon MTurk (<https://www.mturk.com/>), where temporary workers are hired to complete human intelligence tasks (Huff & Tingley, 2015). Other popular platforms are growing, such as Prolific (<https://www.prolific.co/>) and ROI Rocket (<https://www.roirocket.com/>).

### Illustrative Theory Advancements by Adopting Web-Based Data

Now, we transition to provide some examples of theory advancements by adopting Web-based data, which we preview and summarize in Table 2. First, it is possible to obtain Web-based data to advance stakeholder theory (Harrison, Bosse, & Phillips, 2010). Specifically, we can examine the degree to which executives attempt to align and manage the utility functions of diverse stakeholders. At first glance, data on executives' behaviors may be considered hard to obtain. However, publicly available sources allow for access to CEO letters to shareholders, transcripts of calls with analysts, and videos of executive speeches. These types of Web-based data can then allow

researchers to examine the frequency and extent to which executives publicly recognize the needs of stakeholders. This approach allows for empirical tests of stakeholder theory in ways never before imagined by looking at how executives balance their responsibilities in rhetoric. Rhetoric in these contexts represents another perspective on how executives balance the needs of their stakeholders. Such a methodological innovation can be partnered or complemented by other more traditional approaches to studying CEO activities (e.g., firm mergers and acquisitions).

As another example, critically examining social identity theory is also possible (Ashforth & Mael, 1989). For example, Web-based data can help in investigating the extent to which individuals consider expanding their identities by joining new interest groups on social media (e.g., Facebook groups or Twitter following). Additionally, Web-based data can be used to explore upper echelons theory (Hambrick, 2007b) by exploring the extent to which changes in the diversity of corporate boards influence firm performance over time. Specifically, Senate Bill 826 of the state of California mandated the addition of women to corporate boards in 2018 (Weber, 2022). Web-based data can assess changes in future corporate boards and investigate effects on important organizational outcomes. As two more examples, equity theory (Adams, 1963) could be advanced by using Web-based data to understand how employees make social comparisons regarding pay (Huseman, Hatfield, & Miles, 1985, 1987) internal to their firm relative to external comparisons. Finally, Web-based data could be used to advance network theory (Borgatti & Halgin, 2011) by examining how

**TABLE 2**  
**Innovative Methods and Data for the Advancement of Theory and Policy-Making: Web-Based (aka Big) Data**

Illustrative Sources Describing Methodological Innovation	Illustrative Theories and Research Questions and Resulting Policies
Landers et al. (2016); LeBaron et al. (2018); Walter, Seibert, Goering, and O'Boyle (2019)	<ol style="list-style-type: none"> <li>1. <i>Stakeholder theory</i>: To what extent do executives attempt to align and manage the utility functions of diverse stakeholders?</li> <li>2. <i>Social identity theory</i>: To what extent do individuals consider expanding their identities by joining new interest groups on social media?</li> <li>3. <i>Upper echelons theory</i>: To what extent do changes in the diversity of corporate boards influence firm performance over time?</li> <li>4. <i>Equity theory</i>: To what extent do employees make social comparisons internal to their firm compared to external regarding pay?</li> <li>5. <i>Network theory</i>: To what extent are employee referrals via LinkedIn effective in increasing the diversity of applicant pools?</li> </ol> <p>■ <i>Relevant areas for improved policy-making</i>: stakeholder relationships, social media usage, board diversity, corporate governance, quota systems for corporate boards, and compensation and fair pay, as well as affirmative action</p>

employee referrals via LinkedIn effectively increase the diversity of applicant pools.

### **Policy Implications**

The aforementioned theory advancements can later inform policy-making in several areas. For example, stakeholder relationships, social media usage, board diversity, corporate governance, quota systems for corporate boards, compensation and fair pay, and affirmative action.

## **METHODOLOGICAL INNOVATION 2: VIDEO-BASED METHODS**

### **Description**

Video-based methods have existed for several decades, and have been the focus of numerous methodological articles and even a journal special issue (LeBaron et al., 2018). Yet, despite the availability of information and tools, dissemination and adoption of these methods have been slow in management relative to other disciplines (Christianson, 2018).

Video-based methodological advancements are unique relative to traditional approaches in management research, which primarily rely on questionnaires or archival datasets (Barnes, Dang, Leavitt, Guarana, & Uhlmann, 2018; Eby, 2022; Fischer, Hambrick, Sajons, & Van Quaquebeke 2020). They capture objective data (Hindmarsh & Llewellyn, 2016), and four key features characterize this methodological innovation (LeBaron et al., 2018). First, there is multimodality, given that visible and audible behaviors can be studied simultaneously. In other words, theory can be advanced by observing, for instance, the facial features of participants at the same time as listening to the tone and content of their speech. Second, there is embodiment in that bodily movements are not traditionally captured in other methods but can be operationally defined and measured with video-based methods. Third, the phenomena of interest can be studied in the context in which they are embedded. Finally, there is sequence (LeBaron et al., 2018). That is, video-based data allow for capturing the ordering of a phenomenon's events, actions, or occurrences. Finally, adding a temporal element to theoretical concepts of interest allows for more comprehensive theory building and testing.

### **Illustrative Theory Advancements by Adopting Video-Based Methods**

Using video-based methods allows for capturing interactions or patterns of behavior in ways never

previously imagined. This includes verbal and non-verbal behaviors, such as gestures (Congdon, Novack, Goldin-Meadow, 2018). Consequently, management theory can be built and tested in new ways. Videos can be analyzed using quantitative and qualitative approaches and may be watched and rewatched to allow for richer analysis and reproducibility. Information captured can include frequency, duration, and timing of behaviors (Christianson, 2018). It is the intersection of phenomena and spatial relations that is most unique. That is, how people interact with each other, elements in the physical environment, and space. Participants can be shown videos and asked to express their perspectives regarding their experiences of interactions as a form of member check. Member checks are common in traditional qualitative research to ensure that emerging themes or relationships resonate or connect with original participants (Lincoln & Guba, 1985).

Numerous theoretical questions can be pursued with increased use of video-based methods, as summarized in Table 3. For instance, in the context of agency theory (Dalton, Hitt, Certo, & Dalton, 2007), future research can examine the extent to which executives publicly address the goals of distinct principal groups because video-based methods can be used to examine the behaviors of executives in their interactions with principals. Returning to the example of the leadership literature mentioned above, most leadership research has been questionnaire-based. In contrast, MacLaren, Yammarino, Dionne, Sayama, and Rurak (2020) used a video-based method to record actual leader behavior and capture true speaking time. Such an approach to objectively studying behavior could be extended to executives. Data science may be particularly useful to build and test agency theory further. Again, a triangulation approach can complement traditional methods of studying agency theory.

As another example, trait activation theory (Tett, Toich, & Ozkum, 2021) can be investigated by exploring the degree to which high scores on the personality trait of extraversion (in a recorded Zoom meeting using an algorithmic approach) compare to scores from a self-report measure. In addition, other contingencies in the environment of the Zoom meeting could then be considered as moderating variables. Finally, role congruence theory (Konrad & Cannings, 1997) could also be advanced by using video-based methods to investigate how follower evaluations of their leaders' emotions are contingent upon their gender.

To advance media richness theory (Daft & Lengel, 1986), video-based methods could be leveraged to

**TABLE 3**  
**Innovative Methods and Data for the Advancement of Theory and Policy-Making: Video-Based Methods**

Illustrative Sources Describing Methodological Innovation	Illustrative Theories and Research Questions and Resulting Policies
Christianson (2018); Congdon et al. (2018)	<ol style="list-style-type: none"> <li>1. <i>Agency theory</i>: To what extent do executives publicly address the goals of distinct principal groups?</li> <li>2. <i>Trait activation theory</i>: To what extent does extraversion in a Zoom meeting correlate with extraversion based on a self-report measure?</li> <li>3. <i>Role congruence theory</i>: To what extent are followers' evaluations of their leaders' emotions contingent upon the leaders' gender?</li> <li>4. <i>Media richness theory</i>: To what extent does the effectiveness of leadership behaviors in-person translate to a virtual environment?</li> <li>5. <i>Complexity theory</i>: To what extent do the behaviors of toxic team members contribute to the overall climate of teams?</li> </ol> <p>■ <i>Relevant areas for improved policy-making</i>: CEO–board relationship management, training and development, equity and inclusion, job design, and individual and team performance management</p>

ask, to what extent does the effectiveness of leadership behaviors in-person translate to a virtual environment (Bell, McAlpine, & Hill, 2023)? Finally, long-standing questions in complexity theory could be answered by exploring the degree to which the behavior of toxic team members contributes to the overall climate of teams (Anderson, 1999). These are just some of the many examples of how adopting this methodological innovation could accelerate the advancement of management theories.

### Policy Implications

The aforementioned theory advancements are closely related and can inform policy-making in several areas. For example, CEO–board relationship management, training and development policies, equity and inclusion, job design, and individual and team performance management.

### METHODOLOGICAL INNOVATION 3: COMPUTER-AIDED TEXT ANALYSIS

#### Description

As of January 2023, there were an estimated 1.13 billion websites (Huss, 2023). Data sources such as these create a tremendous amount of text, which is simply too extensive to be analyzed using traditional qualitative methods such as thematic analysis, qualitative content analysis, or other techniques that use a constant comparative approach. Hence, the third illustrative methodological innovation we discuss pertains to CATA. CATA techniques can vary in terms of the degree to which there is full automation

(e.g., some deep learning and neural network techniques) to approaches in which there is very little automation (e.g., open and axial coding in grounded theory), or when there is a blend of techniques (e.g., topic modeling; Banks et al., 2018). In addition, methodological breakthroughs have occurred rapidly in recent years (Hannigan et al., 2019; Schmiedel, Müller, & vom Brocke, 2019). Thus, CATA can provide scale in analyzing much larger data, reduce random error, and still allow for human involvement, whether strictly deductive or inductive (McKenny, Aguinis, Short, & Anglin, 2018).

While CATA has made great advances in other areas, there have been only rare applications in management research (Schmiedel et al., 2019). Consider topic modeling as one form of CATA. Topic modeling techniques, such as latent Dirichlet allocation (Blei, Ng, & Jordan, 2003), can be used to identify latent topics in text, such as emails, open-ended survey response text, and interview transcripts, to advance theory (Hannigan et al., 2019). Topic models leverage Bayesian hierarchical mixture models that seek to leverage the cooccurrence of word patterns to identify latent topics (Banks et al., 2018). The focal unit of analysis for topic modeling can be entire documents, paragraphs, or sentences, depending on what is theoretically appropriate. The sample size is a function of the number of documents and the length of those documents. Variations of topic modeling, such as structured topic modeling, allow one to examine whether men and women as leaders engage in similar or different types of signaling to followers. Several tools can be used to analyze text, such as Linguistic Inquiry and Word Count, Praat,



which can be used to examine pitch, intensity, and voice breaks in conversations (Ramani & Aguinis, 2023; Waller & Kaplan, 2018). Other resources include the CAT Scanner (CAT Scanner, 2022), a collection of Word dictionaries for calculating word frequency occurrence in text.

### Illustrative Theory Advancements by Adopting Computer-Aided Text Analysis

There are several ways in which this methodological innovation can be used to advance theory and subsequent policy-making, as we summarize in Table 4. For example, topic models can be utilized to identify signals from entrepreneurs in written communication to potential investors (Connelly, Certo, Ireland, & Reutzel, 2011). Topic modeling allows latent constructs within a corpus of text to emerge. This functions as a factor analysis in which we simplify the complexity of the data structure. Thus, this methodological innovation could be used to advance signaling theory by asking, for example, to what extent do entrepreneurs signal consistently across different investor groups? Signaling theory is a basis for bridging asymmetries, which are common when entrepreneurs make pitches to garner excitement for a startup. How is this best done? Does entrepreneurial signaling work similarly for men and women? These types of questions can be answered on a large scale with CATA because vast amounts of text can be analyzed in minutes. Moreover, an additional benefit is that analytic reproducibility is maximized.

In addition, affective events theory (Weiss & Cropanzano, 1996) can be advanced by asking, “To what extent do employees engage in surface and deep

acting in email communications after mergers and acquisitions?” There are several deductive and inductive ways in which future research can approach analysis of the text (Banks et al., 2018). As a result, future research can be less limited in how theories are built and tested. For example, social learning theory (Bandura, 1977) can be explored by investigating how followers’ rhetoric mimics leaders’ rhetoric by analyzing meeting transcripts. As an example pertaining to social comparison theory (Buunk & Gibbons, 2007), we can examine the extent to which employees leverage upward (compared to downward) social comparisons in moral decision-making investigated through analysis of meeting transcripts (Fleischmann, Lammers, Diel, Hofmann, & Galinsky, 2021). As yet another example, behavioral theory of the firm (Argote & Greve, 2007) can be advanced by asking, to what extent do firms change their communication (analyzed via text) with stakeholders during a crisis?

### Policy Implications

The aforementioned theory advancements can inform policy-making in several relevant areas. For example, communication between entrepreneurs and (potential) investors, strategic management of firm change, ethics and ethical leadership, and crisis management.

### HOW TO OVERCOME BARRIERS TO THE DIFFUSION AND ADOPTION OF METHODS AND DATA INNOVATIONS

This section discusses solutions for overcoming the four barriers to the diffusion and adoption of

TABLE 4

#### Innovative Methods and Data for the Advancement of Theory and Policy-Making: Computer-Aided Text Analysis

Illustrative Sources Describing Methodological Innovation	Illustrative Theories and Research Questions and Resulting Policies
Banks et al. (2018); Blei et al., (2003); Hannigan et al. (2019); Schmiedel et al. (2019)	<ol style="list-style-type: none"> <li>1. <i>Signaling theory</i>: To what extent do entrepreneurs signal consistently across different investor groups?</li> <li>2. <i>Affective events theory</i>: To what extent do employees engage in surface and deep acting in email communications after mergers and acquisitions?</li> <li>3. <i>Social learning theory</i>: To what extent does followers’ rhetoric mimic leaders’ rhetoric by analyzing meeting transcripts?</li> <li>4. <i>Social comparison theory</i>: To what extent do employees leverage upward (compared to downward) social comparisons in moral decision-making?</li> <li>5. <i>Behavioral theory of the firm</i>: To what extent do firms change their communication with stakeholders during a crisis?</li> </ol> <p>■ <i>Relevant areas for improved policy-making</i>: communication between entrepreneurs and (potential) investors, strategic management of firm change, ethics and ethical leadership, and crisis management.</p>

**TABLE 5**  
**Solutions for Overcoming Barriers to Methodological Innovations**

Barriers	Solutions
1. Insufficient knowledge or skills	<ul style="list-style-type: none"> <li>■ Increased availability of methods tutorial articles</li> <li>■ User-friendly and open-access materials (e.g., analytic code, shiny apps)</li> <li>■ Increased availability of video-based tutorials</li> <li>■ Promotion of open-access publishing</li> <li>■ Collaborations across disciplines (e.g., through the use of seed grant programs)</li> </ul>
2. Inadequate adoption of technology	
3. Outdated norms	<ul style="list-style-type: none"> <li>■ Introduction of reviewer education</li> <li>■ Combinations of studies using different designs to provide complementary evidence</li> </ul>
4. Inefficient incentives as well as inapplicable journal and professional organization policies	<ul style="list-style-type: none"> <li>■ Journal special issues and author guidelines (which set policies) that welcome and encourage methodological innovations</li> <li>■ Awards for methodological innovations</li> <li>■ Research funding incentivizing methodological innovations</li> </ul>

methodological innovations. As a preview, we summarize each of these solutions in Table 5.

### Overcoming Insufficient Knowledge or Skills (Barrier 1)

For each of the three methodological innovations described above, there are now improved tools for making such knowledge more accessible. First, tutorials are available for these innovations. For instance, user guides for R packages and published articles demonstrate techniques such as preprocessing and conducting structured topic modeling (Banks et al., 2018; Hannigan et al., 2019; Schmiedel et al., 2019). As a second solution, it has now become more common to create and distribute innovations through apps. These and other open-access materials are available on websites such as GitHub and the Open Science Framework. Such resources can also aid in the training and development of early-career scholars (e.g., doctoral students) who may not have faculty with such expertise at their university.

Third, video tutorials, such as those found on YouTube, demonstrate the use of methodological innovations and help overcome the insufficient knowledge and skills barrier. YouTube or other social media platforms can be a common means by which to disseminate methodological innovations (e.g., Center for Open Science, 2021) and may be applied to several methods and data. Video tutorials help generate excitement for innovations, demonstrate their use, and also serve as another way to make knowledge and skills about methodological innovations more accessible.

As a fourth solution to insufficient knowledge and skills, consider open-access publishing. This would address the lack of access to subscription-based

databases and journals (see Table 1). Teams of authors can divide the costs of publishing open-access articles to make the knowledge more accessible. Costs of open-access publishing can also be added to funded grants. Journals, with permission from publishers, can assist by making certain sets of articles open access for a short period. For instance, *The Leadership Quarterly* indexed 20 modern-methods articles in management and leadership research, making five of the articles free to access (ScienceDirect, 2023). As a more extreme step, libraries of universities, particularly those with a large state-funded system (e.g., California, North Carolina), can transfer money used to pay for access to journals to spending this money on making articles open access. Finally, many universities, particularly in Europe, have agreements with publishers such that articles authored by their faculty are automatically published as open access. Overall, this step offers the additional benefit of improving access to journal articles, which can lead to more citations and a higher overall impact factor, increasing the value of the journal in the eyes of publishers. Hence, removing paywalls that prevent access to journal content can add value in several ways (Nosek & Bar-Anan, 2012).

### Overcoming Inadequate Adoption of Technology (Barrier 2)

We acknowledge that challenges related to inadequate technology adoption may take longer to overcome. However, first, collaborations with those in other disciplines, such as computer science, may help increase accessibility to these needed tools and technology. Notably, seed grant programs can be used to encourage collaboration across disciplines (e.g., computer science and human resources), and

these types of collaborations may be particularly useful in overcoming this barrier. Having collaborators in other disciplines can thus remove the barrier of hesitancy in adopting methodological innovations.

### **Overcoming Outdated Norms (Barrier 3)**

As a first solution to overcoming outdated norms, reviewer education about the alignment between theory and methods is critical (see Köhler et al., 2020). This step may reduce reviewer bias that emerges as reviewers assess manuscripts describing unfamiliar methodologies.

As a second and related solution, scholars using particular innovations may need to complement innovative data or analysis with a more traditional approach to demonstrate to reviewers a conceptual replication (e.g., comparing topic modeling with qualitative content analysis). That is, triangulation can include the combination of studies using different designs to provide complementary evidence. Social norms can then change as researchers see a mixture of methods. As another example, tools such as naturalistic experiments (Heath & Luff, 2018) partnered with observational studies can also help to mitigate concerns regarding a Hawthorne effect in video-based samples (i.e., where participants change their behavior as a function of knowing they are being observed). Other naturalistic videos can still serve theory-building efforts even if the goal is not to test theory but to build it inductively.

### **Overcoming Inefficient Incentives as Well as Inapplicable Journal and Professional Organization Policies (Barrier 4)**

First, journals can leverage special issues and author guidelines (which set policies) to explicitly welcome and encourage innovative methodology and even directly target a desired innovation's promotion. For example, explicitly setting policy and calling for submissions gives authors a clear avenue to try methodological innovations for the first time. Further, such special issues make it clear to action editors and reviewers that the purpose is to encourage innovation. Hence, many will experience the innovation for the first time, and the subsequent articles will begin to make such behavior more normative. Further, special issues could be focused on specific domains, such as strategy, entrepreneurship, human resources, or organizational behavior, that could benefit from methodological innovation.

Second, journals and professional societies can introduce awards or revise existing award standards. These awards would be aimed at recognizing and highlighting methodological innovations that are not only particularly novel but also provide solutions to past problems or new opportunities. Third, grant funders should support methodological innovations within research projects. This would immediately address the concern regarding a lack of incentives and realization regarding the competitive advantages of methodological innovations (see Table 1). Financial incentives from funders would motivate researchers and aid in acquiring the needed resources to refine or promote such innovations (furthering the competitive advantage for adopting the innovation).

## **DISCUSSION**

Methods and data innovations play a critical role in advancing theory and policy-making. Yet, as evidenced by several reviews, methodological innovations often take decades to be disseminated and adopted. First, relying on theories about knowledge diffusion, adherence, and innovations, we described barriers to the dissemination and adoption of methodological innovations: insufficient knowledge or skills (Barrier 1), inadequate adoption of technology (Barrier 2), outdated norms (Barrier 3), and inefficient incentives as well as inapplicable journal and professional organization policies (Barrier 4). Then, we discussed three illustrative methodological innovations: (a) collection of Web-based (aka big) data, (b) utilization of video-based methods, and (c) use of CATA techniques. Next, we provided illustrations of the great potential of these methodological innovations to help advance theories and answer specific research questions that result in better-informed policies in micro and macro research. Finally, we described barriers that are particularly relevant to the adoption of each innovation, and offered solutions to overcome each of these barriers.

To be clear, the diffusion of methodological innovations is a theory driver; therefore, we encourage the adoption of innovative methodological tools for theory testing, validation, and expansion, given the following three considerations. First, we are not advocating for further mushrooming of theories or methods. On the contrary, we argue that methodological innovations help develop and, importantly, test theory. Thus, methodological innovations are needed to understand which theories are more robust, trustworthy, and credible. We can have more confidence in the proposed theories by implementing

multiple methods and engaging in triangulation. Second, innovative methods and data can be used for theory pruning (Leavitt, Schabram, Hariharan, & Barnes, 2021). Third, there is an accelerating demand for new theories, something Hambrick (2017a) called “theory fetish.” Thus, methodological innovations are particularly necessary to understand which existing theories we should keep and which we should not. However, methodological innovations should not become a similarly pernicious “methodological fetishism” (Suddaby, 2014; Tourish, 2020).

Third, useful and sound policies result from replicable and trustworthy theory. Methodological innovations that improve theory development and testing will help produce more useful policies. As an example, consider organizational neuroscience. Some have suggested that “without the appropriate application of cognitive neuroscience, organizational science will find it far more difficult to advance at the same rapid rate that it has over the past century” (Lee, Senior, & Butler, 2012: 922). Yet, while early work in this area showed promise (Waldman, Balhazard, & Peterson, 2011), others have suggested that methodological innovation was not appropriately applied (Prochilo, Louis, Bode, Zacher, & Molenberghs, 2019). In the case of neuroscience, reliability and validity concerns were present (Button et al., 2013). Lindebaum and colleagues (Lindebaum, 2016; Lindebaum, Al-Amoudi, & Brown, 2018; Lindebaum & Jordan, 2014) pointed to the pressure for accelerating theory to the extent that new methods were diffused and adopted prematurely, which, ironically, slowed theory advancement.

While we selected three innovations, additional ones have undoubtedly emerged, and more will come. Some examples include experience sampling methodology (ESM; Gabriel et al., 2019), neurological analysis (Waldman, Wang, & Fenters, 2019), social network analysis (Borgatti & Halgin, 2011), innovations in qualitative methods (Locke, Feldman, & Golden-Biddle, 2022), and virtual reality experiments (Hubbard & Aguinis, 2023). Some of these methods are more resource intensive. For example, ESM requires substantial resources given that multiple waves of data are needed, and neurological analysis also requires substantial financial resources given equipment requirements. However, this is not the case for all methodological innovations.

Network analysis is another methodological innovation that has been slow to be diffused and adopted. One application involves exponential random graph models (ERGMs; Butts, 2006). Generally, graphical, interpretive visuals can serve as a meaningful methodological innovation. ERGMs can be used to

contextualize hypotheses by probabilities while accounting for structural tendencies (Contractor, Wasserman, & Faust, 2006). This approach can be further expanded to account for temporal factors (see Downing, Kang, & Markman, 2019). The implications of this methodological approach can have immediate implications as one analyzes millions of observations to create competition networks for firms and ultimately develop evidence-based policy.

## CONCLUSIONS

By diffusing and adopting innovative methods and data, theory advancements can result in better-informed and more effective policies. In our article, we referred to stakeholder relationships, social media usage, board diversity, corporate governance, quota systems for corporate boards, compensation and fair pay, affirmative action, CEO–board relationship management, training and development, equity and inclusion, job design, individual and team performance, communication between entrepreneurs and (potential) investors, strategic management of firm change, ethics and ethical leadership, and crisis management. As noted by Markman and Wood (2022: 4) in describing the goals of *Academy of Management Perspectives*,

The theory–policy focus reflects an interest in commanding issues within firms and across economy and society. In turn, this affords management researchers opportunities to be more ambitious and wide-ranging in theory building and to present more novel insights and policy options in dealing with substantive questions.

We hope our article will serve the role of “accelerator” of methodological knowledge diffusion in the field of management, not for the sake of methods per se, but to develop and test more robust, replicable, accurate, predictive, and credible theory that will result in better-informed and more effective policy-making.

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