

# SURFING THE GRAND CHALLENGES WAVE IN MANAGEMENT SCHOLARSHIP: HOW DID WE GET HERE, WHERE ARE WE NOW, AND WHAT'S NEXT?

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## ABSTRACT

*Research on grand challenges in the management literature is vibrant and growing. Given that the term “grand challenges” was first invoked in our field 10 years ago, it is timely to reflect on how we came to this point – and where we might go from here. In this article, we first explore the origins of the concept of grand challenges in order to trace core assumptions and developments and understand how they shape the current conversation about grand challenges in management scholarship. We next convey findings from our review of 161 papers that cite the editorial for a grand challenges special issue (George, Howard-Grenville, Joshi, & Tihanyi, 2016), uncovering four ways in which papers are shaping the conversation on grand challenges. Finally, based on our perspective on how we got here and where we are now, we make several suggestions for what should come next in driving forward research on grand challenges. We urge scholars to go beyond the study of collaboration for tackling grand challenges and shift toward a more critical, yet generative, exploration of their construction, persistence, and unintended consequences. We also call for increased attention to theorizing grand challenges to guide practitioners’ understanding of the nature of the thing they are trying to address.*

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Organizing for Societal Grand Challenges

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*In these ways, we hope to inspire management scholars to leverage expertise on processes – not content per se – that shape how grand challenges manifest and how they may be tackled.*

**Keywords:** Grand challenges; sustainability; social impact; wicked problems; research relevance; corporate social responsibility

Management scholars are riding a wave of interest in grand challenges, having caught it about 10 years ago (Howard-Grenville, 2021a) – and this wave still appears far from cresting, given the volume of work currently being pursued and published. While orienting research toward complex problems has always been important, it is increasingly providing a way for scholars to craft their identities, journals to signal their participation in the production of useful scholarship, and funding bodies to reward impactful work (Kaldewey, 2018; Omenn, 2006). This is all before considering whether and how the products of research on grand challenges influence the audiences they aim to serve – the public and private organizations on the front lines of tackling our most vexing and entrenched societal challenges. Given the massive scholarly enterprise that has arisen around grand challenges, it is essential to consider how this wave emerged, what it has yielded, and what it might produce.

Will the wave of interest in grand challenges build momentum and direction, leaving some indelible marks? Or will it diminish and recede, leaving us gripping our surfboards on the beach and hopefully scanning the horizon for what comes next?

In the rest of the essay, we first trace a brief history of the grand challenges concept and its association with tackling big, meaningful problems. We then revisit an editorial co-authored by one of us, introducing a special issue of *Academy of Management Journal (AMJ)* focused on societal grand challenges (George et al., 2016, p. 1880), and reflect on its main messages and how it framed the potential for management scholarship on grand challenges. As this editorial was one of the pieces establishing grand challenges in the management field, we use a forward citation analysis to capture how scholars have used the article and the terminology of grand challenges. We find that management scholars have expanded the conversation on grand challenges in four ways: justifying context, motivating theory, elaborating on the grand challenge concept itself, and engaging in academic introspection. We conclude with some suggestions for how future research might build on these conversations to maximize the impact of the grand challenges wave.

## HOW DID WE GET HERE?

Understanding the origins of the concept of “grand challenges” is vital because it reveals the core assumptions that have been carried along with the enterprise of orienting to and working on grand challenges, and traces how these assumptions

were transformed as the concept rippled across scholarly fields and other domains. Hence, we begin with a brief historical foray to contextualize the emergence of attention to grand challenges in management scholarship.

Grand challenges are traced to the definition, in 1900, by mathematician David Hilbert of 23 problems whose solutions would enable progress in mathematics. While widely credited with the label, Hilbert purportedly never used the term “challenges,” instead favoring “problems” (Kaldewey, 2018). Nevertheless, as origin stories do (Gould, 1989) this one established a time, place, and logic that anchored our subsequent understanding of the label.

Grand challenges came to be associated with problems of significant import that were nevertheless discrete and tractable. At least initially, they were also defined and tackled by a bounded community of experts – those trained in common techniques and working within a scholarly discipline. Spilling over from mathematics, the articulation of grand challenges became increasingly popular in scientific fields in the early 2000s (Kaldewey, 2018; Omenn, 2006). In such fields, knowledge might be regarded as cumulative and progress measurable by somewhat agreed-upon metrics. These features made grand challenges a way to inspire researchers and focus them on problems that were both interesting to advancing the field, and potentially useful to society. Utility to society could be couched in more pragmatic language; given that such fields rely on public funding, leading figures including the president of the American Association for the Advancement of Science recognized that

the concept and promotion of Grand Challenges can help energize ... students, journalists, the public, and their elected representatives ... [and] can show the added value of further major investments in research. (Omenn, 2006, p. 1696)

Articulating grand challenges did not stop with the “hard” disciplines; moving beyond science, computer science, and medicine, a dizzying range of social science and policy fields also designated specific grand challenges. Many had time frames and monetary prizes attached (Kaldewey, 2018; Omenn, 2006). The concept and language of grand challenges became further entrenched in broader discourse following Bill Gates’ announcement in 2003 of the Grand Challenges in Global Health Initiative, which set out 14 specific scientific goals and committed research funding to these.

As more and more grand challenges were articulated, groups began to move away from seeing them as difficult but nonetheless tractable problems toward seeing the actual existence of grand challenges as bound up in complex contexts and causality, which mattered greatly to making progress on them. Early critiques of the Gates initiative noted that a focus on scientifically tractable problems – for example, developing vaccines that did not require refrigeration so they could be delivered reliably in low income countries – risked narrowly framing “health as a product of technical interventions divorced from economic, social and political contexts” (Birn, 2005, p. 515). As other academic disciplines entered the conversation, they expanded the initial logic of tractability. For example, archaeologists settled on 25 grand challenges, which met their

criteria of being – like their mathematical and scientific forebears – “susceptible to a solution supported by data,” yet – in a departure from earlier grand challenges – driven by “cultural processes ... [that] involve complex, nonlinear relationships in which cause and effect are not readily distinguished” (Kintigh et al., 2014, p. 879).

In other words, grand challenges perhaps became grander, or at least more complex and multidimensional, as the communities involved in articulating them expanded and perhaps evolved. It is notable that the London Institute for Mathematical Sciences recently published a new list of 23 mathematical challenges for the twenty-first century, including not only one of Hilbert’s originals (the Riemann hypothesis, relating to the distribution of prime numbers) but many that are far less clearly connected to mathematics, like a theory of free will or explanation for the emergence of virtue (Whipple, 2021). Given that only 17 of Hilbert’s original problems have been even partially solved, this new list feels even more appropriate to contemporary understandings of the vexing nature of grand challenges, with many “problems [that] feel impossible to formulate, let alone solve” (Whipple, 2021).

This history helps contextualize how we have used – and perhaps misused – the label of grand challenges in management studies. The first reference to grand challenges in our field was in 2011 (Colquitt & George, 2011). The label has gained considerable momentum more recently (Brammer, Branicki, Linnenluecke, & Smith, 2019; Ferraro, Etzion, & Gehman, 2015; George et al., 2016). In our literature, grand challenges are often closely associated with – but not fully equivalent to – “wicked problems” (Reinecke & Ansari, 2016; Rittel & Webber, 1973), that is, problems that are persistent and defy solution in part because different actors perceive of and evaluate them differently. Elsewhere in this volume Ferraro, Etzion, and Gehman reflect and elaborate on their characterization of grand challenges as “seemingly intractable” (Ferraro et al., 2015, p. 367) problems that are complex, uncertain, and evaluative.

In the 2016 editorial, which introduced a special issue of *AMJ* focused on grand societal challenges, such challenges were described as “formulations of global problems that can be plausibly addressed through coordinated and collaborative effort” (George et al., 2016, p. 1880). This reflected the vestiges of tractability (“plausibly addressed”) that have been associated with grand challenges since Hilbert’s day. In the editorial, we adopted a modified version of a definition used by Grand Challenges Canada,<sup>1</sup> which reflected the idea – also attributable to Hilbert – that tackling discrete problems would enable significant further progress: a grand challenge was defined as “specific critical barrier(s) that, if removed, would help solve an important societal problem with a high likelihood of global impact through widespread implementation” (George et al., 2016, p. 1881; Grand Challenges Canada, 2011). However, reflecting the emphasis on grand challenges as culturally, politically, and economically embedded, and hence very difficult to “solve,” we also emphasized their scale and scope, the need for action by diverse stakeholders from different levels of organizations and society to engage, and the importance of “collective, collaborative, and coordinated effort” to tackle grand challenges (George et al., 2016, p. 1881).

Different from other scholarly disciplines, we did not define a list of grand challenges to focus the attention of management scholars, nor should we have, as we are not content experts on societal grand challenges, but rather process experts on the organizational mechanisms that produce them and might be rewired to tackle them (Howard-Grenville, 2021a). We recognized in the *AMJ* editorial that as management scholars our “value added” lies in exploring and explaining the processes of individual, organizational, and societal interactions that contribute to the formulation of what constitute grand challenges, the efforts taken to tackle them, and the outcomes of these efforts (George et al., 2016). We offered a framework for guiding future research by management scholars on grand challenges, leaving the definition of specific grand challenges to others; for example, the UN sustainable development goals (SDG).

This framework, reproduced below (see Fig. 1), captures on the left-hand side (blue box) that grand challenges need to be articulated and people motivated to reach some form of consensus on what a particular goal might be. Next, it suggests that articulating grand challenges enables multilevel actions required to tackle them (middle), and, finally, produces outcomes and impact (right-hand side). This left to right progression appears natural and linear but, in reality, is likely anything but. The framework also depicts some of the factors (in bubbles above and below) that influence the opportunities for, and barriers to, grand challenge articulation, action, and outcomes.

As an orienting conceptual model, the framework proved helpful for mapping the papers appearing in the special issue to particular stages and connecting them to various factors. But, as it was never intended as an explanatory process model, we did not “theorize the arrows” on the framework. This would have involved describing the actual mechanisms by which, say, articulating grand challenges drives multilevel actions, or, how coordinating architectures influence the progression from actions to outcomes. To produce such a model that was complete in terms of mechanisms would be near impossible, and furthermore, extraordinarily reductionist and naive.

At the same time, we should recognize that we have not populated much more of the framework in the ensuing years, raising questions about whether our work on grand challenges will, like much of our scholarship, remain scattered among

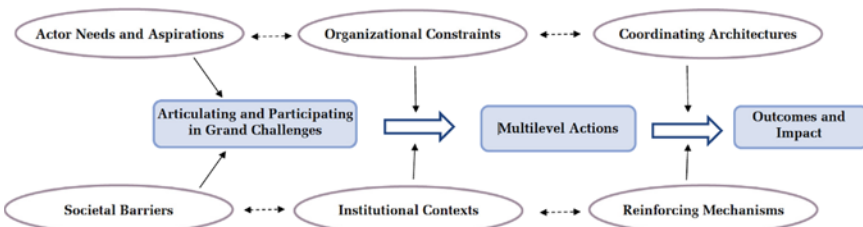


Fig. 1. Framework for Addressing Grand Challenges. Reproduced with permission from George et al. (2016, p. 1888).

similar but parallel lines of inquiry, anchored in different theoretical conversations, and rarely cross fertilize between these. Unlike mathematicians who, in this century, aspire to both a “theory of everything” to explain the universe (challenge #1) and a “theory of simplicity” to enable reconfiguration to new environments (challenge #19) (Whipple, 2021), perhaps management scholars are still casting about to find our sweet spot between too grand and too granular explanations for the processes of defining and taking action on grand challenges? Next, we take a close look at what is being said about grand challenges in management research, specifically that which cites the George et al. (2016) editorial, before returning to consider where we might go next.

### WHERE ARE WE NOW?

When we wrote the George et al. (2016) editorial, we were hoping to spark research on grand challenges but perhaps did not expect the intensity of the response it, alongside related work (Colquitt & George, 2011; Ferraro et al., 2015), would generate. Five years later, it is important to take stock of where we are with the conversation around grand challenges in the management literature to trace and potentially redirect the conversation.

#### *Method of Review of the Literature*

To do so, we conducted a systematic review of all articles that cited George et al. (2016) over the past five years. We identified citing articles through the “cited reference search” function of Web of Science and overlaid these results with Scopus, EBSCO, and Google Scholar databases to find additional work not included in Web of Science. We chose the forward citation approach over a keyword search as we were primarily interested in tracing how the George et al. (2016) essay has been used, and in recognition of the fact that articles using the grand challenges concept may nonetheless not include it in their keywords. This yielded a database of 270 publications. In a second step, we excluded all calls for papers, book chapters, and book reviews – and we visually inspected the remaining list, further excluding articles from journals that we did not consider to be centrally representing scholarly conversations of management scholars. For example, the editorial has been cited in journals as diverse as *British Food Journal*, which we excluded since the primary audience for such a journal lies outside the management field. In sum, our process yielded a final list of 161 articles.

For each entry in the database, we extracted those paragraphs that either refer to the George et al. (2016) essay or mention the term grand challenges (or equivalent terms such as “GC” or “societal challenge”). These extracts were then imported into Nvivo and coded for how they use the concept of grand challenges, that is, what function it has in the paragraph’s argument. For those papers that most substantively engaged with the concept, mentioning it more than a few times, we explored the arguments of the entire paper in detail.

### *Results of Review of the Literature*

Some good news upfront: scholars are not just talking about grand challenges – they are putting in work. Since 2016, there has been a steady rise in publications on the topic and these articles increasingly appear in the most highly regarded journals in our field, with the *AMJ*, *Journal of Management*, and *Journal of Management Studies* among the most popular outlets in the sample. Nevertheless, such trends give us little insight into how the concept of grand challenges is being engaged with and elaborated, and whether anchoring ones' research in this domain is more than just opportunistically catching a wave. Hence, we focused on exploring *how* management scholars have been *using* the concept of grand challenges.

Our analysis identified four ways management scholars are using grand challenges, as refracted through the [George et al. \(2016\)](#) editorial. These are: justifying contexts, motivating theory, understanding grand challenges, and academic introspection. These uses are not mutually exclusive, as some articles use the grand challenges concept to, for example, justify both the context and the theory. Nonetheless, we elaborate each separately as they represent distinct ways authors engage with grand challenges in the management literature.

#### *(a) Justifying Contexts*

One frequent use for the concept is justifying the choice of research context (occurred in 51 articles). Starting from the description of grand challenges as “critical barriers that, if removed, would help solve an important societal problem” ([George et al., 2016](#), p. 1881), authors argue that the context they are studying would indeed be considered a grand challenge and therefore warrants research. The logic offered is: if scholars ought to tackle grand challenges, and X is a grand challenge, then scholars ought to tackle X. Along these lines, grand challenges have prompted research on, among others, environmental issues (16 articles), global health and pandemics (7 articles), inequality (8 articles), migration (5 articles), and poverty (5 articles). More “eclectic” contexts are also framed as grand challenges, such as the aging workforce, big data, corporate control, stigmatization of professions, corruption, and innovation (1 article each).

Whether the grand challenges concept spurred the investigation of these new research contexts or is just being used to justify them post hoc is not a question we can answer in this essay. However, the label seems to, in any case, be a useful rhetorical device for positioning research on significant societal problems and hence moving it into the academic mainstream.

#### *(b) Motivating Theory*

The second line of reasoning, and in fact the most frequent one in our sample (occurred in 86 articles), involves using grand challenges to motivate the choice of theory (or concept). This argumentation takes on the same starting point as “justifying context” that we as management scholars should contribute to solving

grand challenges. However, it engages somewhat more substantively with the concept by emphasizing that such challenges are “complex” or “wicked” problems (Reinecke & Ansari, 2016; Rittel & Webber, 1973), that is, complex, uncertain, and evaluative (Ferraro et al., 2015). Therefore, solving grand challenges is said to require “coordinated and collaborative effort” (George et al., 2016, p. 1880) – which management scholarship can shed light on. This logic has prompted two types of contributions. One, which we label the “toolification approach,” aims to provide the conceptual “tools” for coordinated and sustained activity by studying, for example, collaboration (23 articles), (cross-sectoral) partnerships (15 articles), “new” organizational forms (12 articles), collective and responsible innovation processes (10 articles), or sustainable entrepreneurship (4 articles).

An example of this contribution is Hilbolling, Deken, Berends, and Tuertscher’s (2021) study of temporal coordination in multiparty collaboration. Following the argumentative logic outlined above, the authors claim that, because “complex societal challenges, such as public safety, are considered ‘wicked problems’” they require “diverse resources to realize innovative solutions” which are provided through “multiparty collaborations” (p. 2). For such collaborations to be fruitful, the paper argues that different actors need to align their temporal rhythms, paces, and time horizons. To help organizations do so, Hilbolling et al. (2021) propose three mechanisms: serendipitous alignment, temporary exclusion, and aligning on the future.

The second albeit smaller stream, which we label “roadblock removal,” investigates the dynamics that might undermine coordinated and sustained efforts to tackle grand challenges. Studies in this view consider, for example, conflicting institutional logics (3 articles), hegemonization (1 article), mission drift (1 article), and moral disengagement (1 article). For example, Yin and Jamali (2021) examine how different partnerships between multinational corporations and non-profits in China cope with conflicting institutional logics. They show how an either/or mindset, that is, recognizing trade-offs while denying synergies among partners, leads to the substitution of conflicting institutional logics, which impedes partnership success.

In sum, we can see that many management scholars have gone beyond “grand challenge naming” and begun to heed the call for “tackling” them (George et al., 2016, p. 1880) – both by showing how sustained coordination can be successful and why it may fail.

### *(c) Understanding Grand Challenges*

While justifying contexts and motivating theory make up the bulk of the citations of the George et al. (2016) essay in the 161 articles analyzed, a small subset (11 articles) further theorized the concept of grand challenges as such. These articles engage with the concept on a detailed level and bring greater precision to the definition or use of the concept.

For example, Brammer et al. (2019, p. 518) warn that scholars are using the grand challenges label to refer to “qualitatively distinct types of phenomena” and argue that we would do well to acknowledge these different types explicitly. They develop a two-by-two matrix with geographical scale on one axis and



stakeholder/domain scope on the other to discern societal grand challenges from community grand challenges and, on the off-diagonals, complex grand challenges from global ones. This taxonomy might help authors reflect on how their empirical context aligns with the grand challenges conversation and hence justify their contexts (see section (a), above) with greater precision.

However, there can be a danger in parsing grand challenges along any dimensions, as Jarzabkowski, Bednarek, Chalkias, and Cacciatori (2019) point out in their application of a paradox lens to grand challenges research. They assert that grand challenges provide “fertile ground” (p. 121) for paradoxes, that is, persistent contradictions between interdependent elements. Furthermore, these authors argue that both the geographical scale and the stakeholder domains of grand challenges should be considered as conflated – global challenges manifest locally, while local contexts and cultural understandings shape particular stakeholder perspectives and interests. As a result, grand challenges might play out globally but “comprise a complex set of nested paradoxes that are multi-faceted and inter-organizational” (Jarzabkowski et al., 2019, p. 122).

Finally, using a different theoretical lens, Gümüşay, Claus, and Amis (2020) explore four dimensions of institutional logics – their macro-level positioning, contextuality, temporality, and value plurality – that can aid in the study of specific grand challenges. In some ways echoing some of the messages of a paradox lens on grand challenges (Jarzabkowski et al., 2019), this work calls on scholars to consider explicitly how challenges can be both global and locally situated, as well as socially constructed such that they reflect potentially enduring values yet nonetheless manifest differently over time.

#### *(d) Academic Introspection*

Finally, the grand challenges concept has also been invoked for critiquing the current state of management scholarship (31 articles), most notably problematizing its lack of impact and encouraging novel methods and forms of theorizing. Here, we can broadly identify two streams: The “impact discourse” and “methods for theory-building.”

The former stream consists mainly of editorial material that argues for better orienting the logic and incentives of management research toward practical impact. This emphasizes the “moral obligation to seek to improve social relations” (Nyberg & Wright, 2020, p. 25) and thus proposes changes to academic reward structures. For example, Chapman et al. (2020) argue for using the SDGs as a criterion for judging quality in academic research.

The latter stream takes a step back and considers how scholars might have to change their research methods and approaches to theory building to address the complex interdependencies inherent in grand challenges. Authors discuss ideas such as open theorizing (Leone, Mantere, & Faraj, 2021), configurational theorizing (Furnari et al., 2020), and thought experiments (Kornberger & Mantere, 2020).

In a recent publication, Leone et al. (2021), for example, call on scholars to use open theorizing, that is, drawing on each other’s datasets, code scripts, notes,

methodological protocols, auxiliary findings, and supplemental documentation to build new theory. They argue that, since solutions to grand challenges span across “topical dimensions and levels of analysis,” it makes sense for scholars from different disciplines to share their academic resources to unleash the “epistemic potential that resides in the diversity of research programs and the encounter of different analogies” and create “cross-topic understandings” (p. 20f).

All in all, our review of 161 papers in the core management domain that cite [George et al. \(2016\)](#) shows that there are a variety of ways in which scholars have joined the conversation on grand challenges; from (a) framing contexts as worthy of study; (b) orienting toward theories of collaboration and innovation; (c) elaborating how we conceptualize grand challenges and study them; and to (d) critiquing the management field and calling for further evolution. Next, we discuss how these themes could be built on for future scholarly enquiry.

## WHAT’S NEXT?

Management scholars are indeed riding a sizable and growing wave of interest in grand challenges. We opened this essay by asking if the wave is building momentum and direction, and has left – or will leave – some indelible marks. From our analysis of articles citing the [George et al. \(2016\)](#) editorial and invoking the grand challenges concept, it is clear that management scholars are surfing several regions of the wave simultaneously and moving in varied directions. Looking at all this action from the beach, one might be attracted by quite a lot of activity but unsure where the most exciting stuff is happening. In this section, we consider what our historical foray and review of the current scholarship tells us about the prospect of this wave leaving an indelible mark. To do so, we must first clarify: For whom might this scholarship have an impact?

There are at least two answers to this question. First, a building wave of interest in management scholarship on grand challenges might leave a mark on our field. Themes (c) and (d) from our review – elaborating the grand challenges concept and academic introspection – support and enable such impact by offering and inspiring new contexts, modes of engagement, and theoretical lenses. As evidenced by the number of papers, journal special issues, and calls for greater attention to studying what matters to the world ([Howard-Grenville, 2021b](#); [Tihanyi, 2020](#); [Wickert, Post, Doh, Prescott, & Prencipe, 2021](#)), this orientation to grand challenges seems to be having an effect. There is now far more opportunity for scholars to study and publish work that engages topics of societal relevance, amplified by the fact that businesses and other organizations are more proactive than ever in navigating these issues. We encourage management scholars to take up these calls and add to the already ample creativity evidenced in how our field engages with grand challenges.

But we should not stop here. If we are the only ones watching ourselves surf, we will have had little impact on grand challenges themselves. So, we must ask the same question of a second and far more important audience: Is this wave of management scholarship leaving a mark on how people grapple with and work

on grand challenges? While, due to the difficulty of assessing impact, there is no straightforward “yes” or “no” answer, we believe that grand challenges scholarship is not yet making the most of its potential. We are doing some things that leverage our strengths as a scholarly community. For example, we have recognized that, as grand challenges, increasingly articulated at the societal level (e.g., through the SDGs), are inherently complex, underpinned by persistent interdependencies across scales and seemingly intractable differences in stakeholders’ needs and interests, there is a need for both “content” and “process” expertise. While management scholarship can contribute to understanding processes – including barriers to – making progress on grand challenges, we are not leveraging our potential. In this section, we propose two avenues for increasing our impact.

First, returning to the conceptual framework in [George et al. \(2016\)](#), we urge scholars to go beyond the “middle” of the framework and look both left and right to scrutinize how grand challenges come to be labeled as such and how outcomes and unintended consequences of actions to tackle them unfold. Second, we call for more work to bring precision to the concept of grand challenges. Through such articulation, we might better help those on the front lines of working with grand challenges generate new ways of thinking and acting.

#### *Looking Left & Right*

Our analysis revealed that scholars’ most frequent use of grand challenges is to develop management theories that might help tackle them (see theme (b)). When placing these studies on the framework set out in [Fig. 1](#), however, it becomes apparent that scholars are overwhelmingly focusing on the “middle” of the model, which delineates multilevel actions and the constraints, architectures, and institutional contexts in which they are embedded. Significantly less attention is devoted to the left- and right-hand sides of the framework. In other words, while scholars are devising tools for coordinating and collaborating, they are not yet looking at the antecedents and consequences of these tools.

While devising organizational tools for grand challenges is essential to resolving them, we should be aware that such an approach reflects the solution-focused logic of the original grand challenges construct. This logic suggests that a bounded community of experts can define grand challenges and that their resolution, which implies tractability, will lead to significant societal advancements. Here we believe that management scholars should exercise caution. For, if we take the complex, uncertain, and evaluative nature of grand challenges seriously, grand challenges are neither unanimously definable, nor will their resolution necessarily have “positive” consequences.

Looking to the left-hand side of the framework, especially with a critical eye, suggests considerable potential to research the social and discursive construction of grand challenges. Since grand challenges are complex and evaluative ([Ferraro et al., 2015](#)), what we come to see as a grand challenge is shaped by framing, rhetoric, and discursive processes (see, e.g., [Stjerne, Wenzel, & Svejenova, this volume](#)). What one actor may see as “grand,” others might consider trivial or meaningless. So how does one societal challenge become labeled “grand” and

“worthy of devoting significant resources” while another does not? How do the efforts that feed into such labeling unfold, and whose interests and needs do they represent? Whose interests and needs are ignored or misrepresented? How does the construction of grand challenges motivate or impede action?

While these questions were not explicitly excluded from the original intent of the [George et al. \(2016\)](#) framework, they have been less considered. Nevertheless, they matter a great deal to developing a better understanding of the process through which grand challenges come to be and the actions they motivate. As [Langley \(2021\)](#) and other organizational scholars (see, e.g., Schoeneborn, Vásquez, & Cornelissen, this volume) argue, labels and metaphors matter, for they guide our collective associations with, and understandings of, phenomena and their processual nature. Metaphors “promote particular understandings that may then influence how people assign blame for distressing events, or behave in the face of them” ([Langley, 2021](#), p. 254). For example, anyone concerned with climate change may be intrigued by the rush to commitments to “net zero.” Indeed, the goal of “net zero” – unattainable through technological change alone ([Allwood, 2019](#)) – conjures up the metaphor of a race more so than a doomsday scenario. Races are winnable; irreversible climate change has no victors.

Exploring the left-hand side of the [George et al. \(2016\)](#) framework is not simply about finding out who is involved in articulating needs, how barriers to meeting these are conceptualized, and who is recruited to act. It is also about scrutinizing what values and assumptions are associated with a certain formulation of a grand challenge, what other problems and processes these map on to, and the degree to which any of these adequately capture the inherent complexity of a grand challenge. Here is where some of the work to elaborate the grand challenge concept (theme (c) above) might be helpful. For example, [Brammer et al. \(2019\)](#) offer seven amplifying factors that influence the emergence of a challenge as grand, including the scale of ambition and diversity of stakeholder groups taking an interest; conversely, they posit four confounding factors that limit problems from presenting as grand challenges, including the degree to which they remain uncertain or groups engaging with them remain ideologically distant. This suggests a degree of consensus might be needed, as implied in the [George et al. \(2016\)](#) framework, to formally define a grand challenge. But, alas, whether we label them as such or not, grand challenges like poverty, inequality and more, exist. Hence, the efforts of other scholars to orient us to how grand challenges arise and *become salient*, due to, for example, changes in external conditions, or organizational interactions that reveal latent tensions, can be productive theoretical tools ([Gümüşay et al., 2020](#); [Jarzabkowski et al., 2019](#)) for exploring the left-hand side of the framework.

Finally, several of the papers we reviewed offer helpful possibilities to unpack this side of the framework. For example, [Salmivaara and Kibler \(2020\)](#) analyze how European Union policy-makers frame the meaning of entrepreneurship for sustainable development to motivate action among private sector organizations. [Wenzel, Krämer, Koch, and Reckwitz’s \(2020\)](#) essay on future and organization studies is another piece that goes in this direction. Using the example of

the Fridays for Future movement, the authors show how future-making practices, that is, ways through which actors produce and enact the future, can shape whether we see climate change as a near-future problem requiring immediate action or a far-future problem which may be addressed in its own time. Hence, how actors frame the future matters for motivating participants to engage with grand challenges. This also suggests new ways of thinking about how grand challenges get constructed. We need not wait for them to arise and become salient but offer ways to conceptualize the active triggering of efforts to construct grand challenges.

Looking to the right-hand side of the framework, scholars might want to devote additional attention to not just devising “tools” but also studying their “impacts.” In the original, mathematics-inspired formulation of grand challenges, there is an assumption that, if a grand challenge is “solved,” there would be discrete, anticipatable gains. For example, in the field of biology, mapping the entire human genome or detecting and measuring all the proteins in cells and blood have not only discrete end points but many knock-on gains for medical science (Omenn, 2006), albeit opening up a host of ethical questions about the use of this knowledge. However, suppose we take wickedness seriously and orient to the kind of societal grand challenges of interest to management scholars. Then we must wrestle with the fact that capturing and evaluating “impact” is not as straightforward. First, evaluating impact is difficult enough as common measures only imperfectly capture it. This is in part due to the complexity and uncertainty of the underlying processes and in part because we tend to measure what is measurable, which misses other forms of value (Howard-Grenville, 2021c). Second, as Gümüşay et al. mention in the introduction to this volume, since grand challenges are  $n$ -order problems with multiple feedback loops, “solving” them may have unintended consequences. As they suggest, studying the “dark sides” of organizing for grand challenges is also critical for understanding the broader changes that are invoked even when making seeming progress. Finally, the evaluative nature of grand challenges (Ferraro et al., 2015) makes it so that what one set of actors describes as “significant, positive impact,” others may well view as a “drop in the ocean” or, worse, a “step in the wrong direction.” Similar to our argument for the left-hand side, we believe that there is potential for scholars to add considerable nuance to understanding practices and processes around evaluating outcomes of efforts to tackle grand challenges.

### *Theorizing the Grand Challenges Construct*

Another aspect of our forward citation analysis that immediately jumped out at us is that most articles in our sample mentioned the term grand challenges only once or twice – or not at all (see Fig. 2). This is especially true for articles using themes (a) and (b), justifying contexts and motivating theory, that have a median mentions – score of one (justifying contexts) and two (motivating theory), respectively. This reveals that many authors engage with the grand challenges construct superficially rather than substantively – they mention but do not develop it.

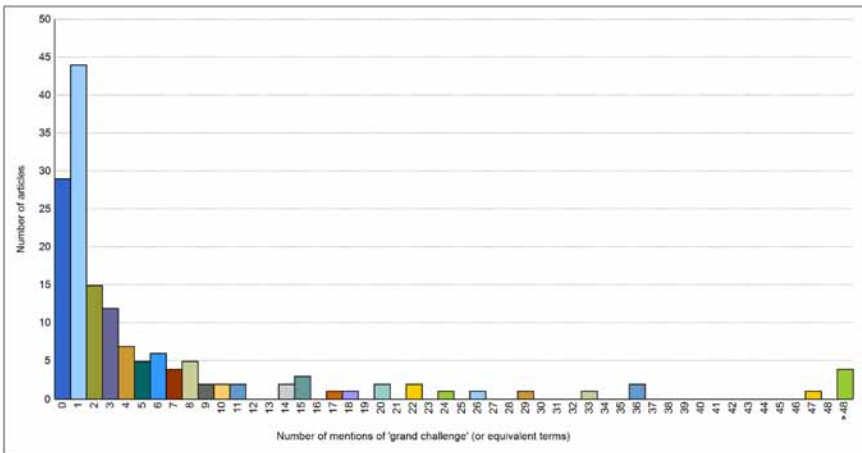


Fig. 2. Articles Citing [George et al. \(2016\)](#) by Number of Times That Invoked the Term “Grand Challenges.” *Note:* A mentions score of 0 means that the article cited the editorial but did not explicitly address grand challenges – for example, because the article references the SDGs instead.

However, we believe that there is considerable impact potential in providing practitioners with a more precise understanding of the grand challenges construct. Those who are on the front lines of working on grand challenges use various models – from “theory of change” approaches that connect desired goals or impacts (linearly backwards) through to actions and interventions, to more complex systems thinking approaches that map multiple actions, stakeholders, and reinforcing and balancing links between them. Can we offer additional ways of thinking that enable traction on vexing grand challenges?

We suggest it would be fruitful to expand on the work from theme (c) of our analysis that has begun ([Furnari et al., 2020](#); [Gümüşay et al., 2020](#); [Jarzabkowski et al., 2019](#); [Leone et al., 2021](#)). In doing so, we might enable practitioners to grasp grand challenges in terms of what they are – namely, very different from the problems we typically solve through the application of reductionist, linear thinking – and hence prompt new ways of making sense of them. As Jarzabkowski et al. note, for example, sharing with practitioners that grand challenges are paradoxical can result in “shifting their expectations from resolving contradictions to understanding that contradictions will continue to resurface in the dynamic process of engaging with a grand challenge” which in turn “might help alleviate feelings of disappointment and defeat associated with navigating such complex, important and intractable societal problems” ([Jarzabkowski et al., 2019](#), p. 129). Indeed, understanding not just when collaboration goes well, but how to engage productively with complexity, difference, and interdependence is central to tackling grand challenges.

Finally, it bears pointing out what by now we hope might be obvious: a linear perspective on grand challenges that frames them as being articulated, acted upon, and having (desired) outcomes is an oversimplification at best. This does

not mean that it is not helpful to break down these phases and encourage scholars to study a myriad of questions associated with each (see Table 2 in [George et al., 2016](#)). However, a more accurate image capturing the nature of grand challenges as complex, persistent, and interdependent might look more like a plate of entangled spaghetti than a linear progression of boxes and arrows. Or, at least there would be many connecting feedback loops alongside the boxes and arrows. This is not to argue that we *should* develop such a framework, model, or image. After all, mathematicians are working on a theory of everything in the coming 100 years, so we should respect a division of scholarly labor! Joking aside, the need for parsimony in how we convey complex phenomena, such as grand challenges, must be balanced against ways of capturing – for ourselves and others – key aspects of their complexity.

In making our theories useful to practice, scholars may also want to keep in mind the potential “dark sides of impact.” As [Ghoshal \(2005\)](#) notes, management theories can resonate with practitioners in unforeseen ways and can prompt actions that the theorist may not have fully intended. Especially in contexts as complex as grand challenges, it is hard for researchers to know what impacts their work will have. This suggests, as many have previously called for, modes of engaged scholarship ([Sharma & Bansal, 2020](#); [Van den Ven & Johnson, 2006](#)) that bring researchers and practitioners together to work on grand challenges as partners. In this way, researchers might better gauge the right amount of complexity to put into their theories and correct for potential unintended consequences of theorizing.

After all, the intent of the [George et al. \(2016\)](#) essay was to inspire management scholars to “turn research into actionable insights to frame and tackle some of the biggest challenges that we face in our global community.” In striving to do that, we must take closer notice of and deeper interest in both our fellow surfers and those we are trying to reach, connecting our creative moves while also challenging ourselves collectively to make this a wave that leaves a mark. Only in that way can we refine our understanding of what grand challenges comprise and make meaningful to others our engagement with them.

## NOTE

1. Funded by the Canadian government, Grand Challenges Canada was founded in 2008, inspired by the Gates grand challenge initiative, and aimed at funding research to address critical global health problems.

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