UNTANGLING INFINITE REGRESS AND THE ORIGINS OF CAPABILITY[*]

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ABSTRACT

We argue that strategic management in general—and capability theory in particular—suffers from problems of infinite regress that can be traced to an unsatisfactory specification of initial conditions. We argue, first, that this has led to an overemphasis on path-dependence, experience and history, without sufficient attention on initial conditions: more proximate, decision-oriented punctuation points that can be used for better theoretical explanation. Second, we show how the initial conditions of theories are often not distinctively different from what is being explained, which prevents theory from providing credible specifications of causal mechanisms. Third, we highlight how the regress problem has led to a relatively casual borrowing of concepts from neighboring disciplines, which has created a mismatch between the aims of management theory and relevance to practice. We suggest research heuristics for how to deal with infinite regress problems, to develop more rigorous and relevant theories of capability and strategic management.

Key words: strategy, infinite regress, capabilities, philosophy of science

> *"It is certain, and evident to our senses, that in the world some things are in motion. Now whatever is in motion is put in motion by another […] If that by which it is put in motion be itself put in motion, then this also must needs to be put in motion by another, and that by another again. But this cannot go on to infinity, because then there would be no first mover, and, consequently, no other mover; seeing that subsequent movers move only inasmuch as they are put in motion by the first mover; as the staff moves only because it is put in motion by the hand. Therefore it is necessary to arrive at a first mover, put in motion by no other; and this everyone understands to be God."*
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> *(St. Thomas Aquinas, Summa Theologica, Pt. 1 Q. 2 Art. 3)*

As noted by Porter, "any theory of strategy must grapple with how far back in the chain of causality to go" (1991, p. 99). For example, if a firm is said to possess some advantage-conferring resource or capability, then this raises immediate questions about how that resource or capability was secured in the first place (Barney, 1986; Helfat & Peteraf, 2003). Thus questions about the origins of capability can quickly lead to the so-called problem of "infinite regress" (Arend, 2015; Collis, 1994; Winter, 2003). A common example of this infinite regress problem is illustrated by the argument that organizations are constituted by basic, "static" or "zero-order" capabilities, and that these in turn are modified by "dynamic," higher or n^{th} order capabilities (Winter, 2003, p. 992). But as noted by Winter (2003), this leads to an infinite regress where it is hard to pinpoint the origins of capability in terms of some ever-higher, n^{th} level of dynamic capability: from "learning" to "learning to learn" to "learning to learn to learn."[1] Or put differently, infinite regress problems can thus lead to a *reductio ad absurdum* where the search for origins leads the field to, in effect, "start with the Big Bang" (Foss, Heimeriks, Winter & Zollo, 2012, p. 117).

While the infinite regress problem is likely to be relevant across many areas of management research, the problem appears to be particularly severe in the case of organizational capabilities (e.g. Jacobides & Winter, 2012; Nelson & Winter, 1982; Teece, Pisano, & Shuen, 1997; Winter, 2012;

[1] A relevant argument here is that advantages in fact might increasingly be short-lived rather than meaningfully sustainable in the long run (Wiggins and Ruefli, 2002; Wiggins and Ruefli, 2005). That is, the idea of infinite regress might simply reflect the ongoing "arms race" (or "Red Queen" effect: Kauffman, 1995) where just staying in place requires increasingly more effort, as the practices associated with competitive advantage diffuse.

Zollo & Winter, 2002).[2] First, the broad and teleological nature of the concept not only includes a large number of very different explanatory aims and dependent variables (e.g., competitive advantage, learning, replication, firm survival, etc), but more importantly it also opens up a multitude of possible explanatory factors (independent variables) that may range across fundamentally different levels of analysis, temporal frames of reference, academic disciplines, and explanatory priorities. Hence, the broad and inclusive nature of the capabilities concept—as we will discuss—provides few, natural punctuation points for stopping a potential infinite regress. Second, the concept of organizational capability is strongly linked to evolutionary and historical approaches (Nelson & Winter, 1982), which naturally raise many infinite regress-related issues about how far into the history of an organization we should pry when searching for the origins of capability (Winter, 2011). Putting too much emphasis on historical factors such as path-dependence risks leading to an infinite regress where factors at t_0 are just imported from t_{-1} and so on, all the way to, say, the manager's DNA or the proverbial Big Bang. This is particularly problematic with the strong emphasis placed on experience as a source of capabilities (cf. Anand et al., 2015).

Infinite regress needs to be halted or punctuated at the right point to allow for explanations that generate useful predictions, credible causal mechanisms, and relevance in the eyes of the target audience. Building on the case of the capability literature in strategy, we argue that management theory in general, and capability theory in particular, suffers from problems of infinite regress that can be traced to an unsatisfactory specification of initial conditions. First, initial conditions typically do not feature proximate and decision-oriented punctuation points that can be used to derive useful predictions—specifically due to an overemphasis on independent variables and factors such as path-dependence, serendipity, experience and history. Second, initial conditions are in many cases not

[2] Organizational capabilities are defined as "the ability of an organization to perform a coordinated set of tasks, utilizing organizational resources, for the purpose of achieving a particular end result" (Helfat & Peteraf, 2003, p. 999). There are two types of organizational capabilities: Operational capabilities are defined as "a high-level routine (or collection of routines) that together with its implementing input flows, confers upon an organization's management a set of decision options for producing significant outputs of a particular type" (Winter, 2000, p. 983). Routines, in this context, refer to a "repetitive pattern of activity" (Nelson & Winter, 1982, p. 97). Dynamic capabilities are defined as the "ability to integrate, build, and reconfigure internal and external competences to address rapidly changing environments" (Teece *et al*, 1997, p. 516).

distinctively different from what is being explained, which prevents theory from providing a full and credible specification of causal mechanisms. Third, due to the common practice of importing assumptions and concepts from neighboring disciplines, initial conditions are often not matched with the unique explanatory aim of management theory, which leaves the theory less relevant to the targeted audience.

Infinite regress problems thus represent a central meta-theoretical issue that deserves explicit attention. In fact, infinite regress issues lurk behind any theoretical argument or empirical analysis in management. However, while infinite regress issues—more often than not—remain implicit, we aim to make these matters more explicit by outlining the different forms that infinite regress problems and their solutions typically take in the field of strategy. The purpose of our analysis is both to highlight strengths and weaknesses in prior work (explicitly or implicitly) dealing with infinite regress, and to offer concrete advice on future theory development, particularly as it relates to the concept of capabilities.

Our essay is organized as follows. The next section highlights the specific forms that infinite regress can take, using the literature on organizational capabilities as our example. In addition to the well-known n^{th}-order regress problem associated with dynamic capabilities, we suggest that the infinite regress problem can also take on two additional forms: experiential regress and hierarchical regress. While the three forms are related, and difficult to clearly separate, they also feature unique characteristics and considerations that have not been distinguished in the literature on capabilities. The third section outlines and illustrates three ways by which strategy researchers might deal with infinite regress problems: a pragmatic approach (making a simplifying assumption to ease the construction of the theory), an application domain approach (cutting off the chain of explanatory factors at commonly accepted disciplinary boundaries), and a so-called real origin approach (identifying the "fundamental" or "real" origin of a capability). We conclude by offering three research heuristics for future theory development, which also summarize the concrete implications of our analysis.

THE INFINITE REGRESS PROBLEM AND CAPABILITIES

The infinite regress problem represents a general philosophical issue that has been raised in a number of disciplines, including physics and philosophy (van Fraassen, 1992). The central question is where scientific explanation should stop or start. In the sciences this has led to the postulation of a hierarchy of disciplines (Oppenheim & Putnam, 1958), where eventually all higher social explanations somehow yield to more reductionist factors associated with disciplines such as biology, chemistry and physics (Schaffer, 2003)—and even the very beginnings of time. Of course, taken to it's extreme, these types of arguments would suggest that the world itself is highly path-dependent and deterministic, originating, in its current manifestations and forms, from initial conditions that go back billions of years.

While these arguments about infinite regress may seem far removed from theoretical or practical concerns, we highlight why infinite regress matters. Any theoretical or empirical paper implicitly makes claims about how they are solving the infinite regress problem by their choice of independent variables and the string of causal relationships or mechanisms included in their analysis. This is particularly evident with the concept of organizational or dynamic capabilities. Thus the notion of capabilities allows us to outline many of the more general challenges and opportunities for theory development related to infinite regress in strategy, and management research more broadly. As indicated above, the n^{th} order infinite regress problem associated with organizational capabilities is already familiar to scholars from extant work (see Arend, 2015; Collis, 1994; Foss et al., 2012; Winter, 2003). Thus our focus next is on two additional forms of infinite regress that have been less acknowledged in the literature: experiential and hierarchical regress. These two forms, while linked to the n^{th} order regress problem, are nonetheless also independent and thus warrant further attention.

The identified infinite regress problems in research on capabilities and the different approaches to solving these problems are summarized in Table 1.

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The Experiential Regress Problem

Among the most common origins, explanations and even measures of capability is "experience." Experiential models of capability focus on a range of similar constructs, such as the frequency of engaging in a particular activity (say, experience with M&As, alliancing, patenting, or new production introductions), path-dependence and history, repetition and iteration, and learning. For example, in their highly influential article on the origin of dynamic capabilities, Eisenhardt and Martin argue that capabilities are about "experiential processes" (Eisenhardt & Martin, 2000)—for example, experience in M&A activity, experience in R&D, and experience in internationalization (e.g., Bingham & Eisenhardt, 2011; Haleblian et al., 2009; Hayward, 2002; Zollo & Reuer, 2010). These approaches typically build on the literature on organizational learning and experience curves (Argote, 1999; Levitt & March, 1988; Levinthal & March, 1993; Zollo & Winter, 2002).

But experience or history-oriented explanations of capability raise immediate, infinite regress-type questions about where this experience or history comes from in the first place. That is, if we say that an organization has developed a capability due to its "history" or "experience"—for example, the number of times it has, say, launched new products or engaged in M&A activity (Anand, Mulotte, & Ren, 2015)—then the immediate question is where that history and advantage-conferring experience came from (Felin & Foss, 2012): what decisions or initial conditions led to these experiences? The experience itself might be a so-called epiphenomenon, that is, a co-varying factor (or by-product) that may not strictly be causal and thus mask other, more fundamental factors that give rise to the capability.[3]

This is best illustrated by focusing on the most popular measure of capability: the number of times an organization has engaged in an activity. As recently summarized by Anand et al., this "number of times" (or experience)-variable has been used as a key independent variable in a number

[3] To provide a trivial example: we might say that an athlete who wins the gold medal in the 100m sprint event did so because of experience in running finals in the past, or even winning these finals. Though winning surely is largely an epiphenomenon in this context, where the capability itself is to be located in other factors (e.g., training by the athlete, coaching, ability or talent).

of contexts in management, including "new production introductions, diversification moves, international expansions, alliances, and acquisitions" (2015, p. 2). Empirical research on capabilities uses counts of past events, actions or behaviors as the central independent variable for measuring capabilities. The field of evolutionary economics has influenced these experiential understandings of capability, by placing a strong emphasis on historical mechanisms (see Nelson & Winter, 1982; for more recent work, see Jacobides & Winter, 2012; Winter, 2012; Zollo & Winter, 2002). Particular emphasis is placed on behavioral patterns, such as routines, which lend themselves to historical analysis, and observation and operationalization. But explanations based on counts of past behavior, or appeals to experience and history, raise questions about how far back in history we ought to go in terms of explaining the history or experience itself. And more importantly, any appeal to a historical or experiential antecedent raises questions about the respective origins of that history: when, why and how was the organization able to engage in that activity in the first place? Thus, as stated by Winter, "the origin of today's organizational routines and capabilities lies in the past, along with the origins of the Constitution of the United States, the Earth, and the element carbon" (2011, p. 10). Again, the problem then might be that experience is an epiphenomenon, that is, endogenous to other factors (Anand et al., 2015; Felin & Foss, 2011).[4]

The emphasis on experiential factors—and the associated problem of infinite regress—also ties into some fundamental, extant debates in the field of strategy, for example, the debate about the respective primacy of resource picking versus capability building as an origin of competitive advantage (Barney, 1986; Dierickx & Cool, 1989; Makadok, 2001; Maritan & Peteraf, 2011). That is, are resources simply picked (or purchased) from the environment (factor markets) or are they internally developed? And, where do advantage-conferring resources then come from in the first place? The literature on resources and capabilities has settled on the underlying "endowment" of

[4] The idea of endogeneity has of course been discussed in terms of its methodological and empirical importance to ensure that scholars properly identify the underlying selection and treatment effects in their models (Hamilton & Nickerson, 2003). Our point in emphasizing the endogeneity of capability is that there are also important theoretical considerations, particularly when capabilities-based work focuses heavily on historical and experiential factors that may have endogenous origins related to the nature of the entrepreneurs, managers and firms involved (Felin, 2012).

resources that a particular firm happens to already possess (Leiblein, 2011), as resources purchased in factor markets may be unlikely to create value, as their cost will exceed their rent-generating capacity, if markets are efficient (though, see Felin, Kauffman, Mastrogiorgio & Mastrogiorgio, 2016).

The literature on capability building typically emphasizes the temporal, experiential, serendipitous and path-dependent nature of building capabilities (e.g., Denrell, Fang, & Winter, 2003; Winter, 2012). The idea of capability building can be summarized by saying that "history matters" (Winter, 2012), or put differently, that organizations and capability development are path dependent (cf. Sydow & Schreyogg, 2009). The research on "capability development trajectories" similarly places emphasis on path-dependence and the scale of experience (e.g., Helfat & Peteraf, 2009; Rockart & Dutt, 2015). The history of the organization represents an accumulation of the various decisions, initial conditions, experiences and contexts that shape the trajectory, behavior, capability development and performance of a firm (e.g., Aldrich, 2006).

However, the accumulated history of activities and experiences—the antecedents of capability building—surely is also initiated or punctuated by managerial or entrepreneurial decisions that enable or provide the endogenous antecedents of those histories and experiences. Thus some have focused on managerial capabilities and decisions (Castanias & Helfat, 1991, 2001), and more recently on cognition (cf. Gavetti, 2005; also see Helfat & Peteraf, 2015). But again, citing experiential and historical factors as central for capability development raises important questions about origins, and the forces that can break, interrupt or intervene in a seemingly path-dependent, or even deterministic, historical process. Thus there are important questions about the role of entrepreneurs, managers and firms in shaping the resources and the set of activities that a particular firm chooses to engage in (i.e., resource picking). The central issue is that focusing on counts or observations of particular activities and experiences over time does not tell us *why* or *how* a firm, or entrepreneur or manager, decided (or had the capability) to engage in that activity in the first place. Here strategy scholars typically invoke some form of non-coincidental superior information (e.g., Barney, 1986), or serendipity (Denrell et

al., 2003). But even the origin of such superior information has to be accounted for in order to avoid the regress problem.

The Hierarchical Regress Problem

Another form of regress has to do with hierarchical levels of analysis. The hierarchical regress problem is different from the experiential regress in that it does not primarily involve regress along the dimension of time but rather towards ever higher or lower levels or units of analysis (e.g., regressing from a system level explanation to a subsystem explanation). That is, if we say that an *organization* has a specific capability (in fact, capabilities are most often explicitly defined as "collective" constructs: see Kogut & Zander, 1992; Nelson & Winter, 1982; Zollo & Winter, 2002), then the immediate question may be whether this capability originates from higher or lower levels of analysis. In other words, when we say that the firm or organization itself, as a social collective, "houses" or is the locus of capability, then we can further push for the origins of that capability hierarchically *upwards* to look at the industry, network, community or even society—or *downwards* toward teams and individuals. Capabilities may be seen as originating from the industry or network that a firm is a part of (e.g., Dyer & Singh, 1998; Kogut, 2000), or they may be seen as originating from the nature of the individuals that constitute the organization (e.g., Castanias & Helfat, 1991; Felin & Foss, 2005).

While there undoubtedly is some truth to both approaches, the central question is whether "regressing" upwards or downwards will give us better and more parsimonious theoretical explanations of capability. This question has in fact led to heated debates between those who advocate methodological individualism versus those who advocate methodological collectivism when it comes to explaining capabilities (e.g., Barney & Felin, 2013; Henderson & Cockburn, 1996; Hodgson, 2012; Nahapiet & Ghoshal, 1998; Spender, 1996; Winter, 2013). These debates can essentially be framed as disagreements about the preferred direction of hierarchical regress in the explanation of capabilities. For example, if individuals are the cause of organizational capability, then we can further press and inquire as to the origins of that individual capability itself: how did those individuals end up in the organization? And where did the individual capabilities originate from?

Capability-based explanations then can lead to the study of individual biographies, the background of employees, or perhaps even genetic DNA analysis. Evolutionary psychologists have of course tried to push higher-level explanations of phenomena in this fashion down to the level of individuals and genes and evolution. And in similar fashion, some in strategy have recently moved to study the lower-level, "neuro"-foundations of strategy and entrepreneurship (Holan, 2014; Laureiro-Martinez, Brusoni, Canessa & Zollo, 2014; Powell, 2011).

But, beyond reduction to lower levels of analysis, hierarchical regress might also lead us to focus on higher levels of analysis. Some scholars have explicitly argued that the "locus" of capability and competitive advantage indeed lies at the level of inter-organizational relations and networks (see Dyer & Singh, 1998; Powell *et al*., 1996), rather than at the level of firms or individuals. The logic is that firms—let alone individuals—simply cannot house all the relevant knowledge needed for innovation and capability development (Kogut, 2000; also see Nahapiet & Ghoshal, 1998; Spender, 1996), and therefore the central focal point and origin of capability must lie at higher levels, such as inter-organizational relations and networks. However, this logic of turning to ever-higher levels of analysis also suffers from a potential regress problem if no clear stopping point is provided for where this levels-related expansion of the explanation should end. Why just focus on networks—why not focus on higher levels such as society, the nation, or even the global economy? But pragmatically, if we say that alliances or networks are the source of capability and advantage, this raises questions about how and why those alliances were secured by the focal firm in the first place.

There is also a risk that the very notion of firm boundaries (see Zenger et al., 2011), and thus also the notion of firm-level competitive advantage (see Coff, 1999; Peteraf & Barney, 2003), gets lost if we continue this regress to ever-higher levels of analysis. But clearly boundaries still matter (cf. Argyres et al., 2012). Furthermore, it simply can't be assumed, as much of the literature does, that individuals in an organization or nodes of networks (at whatever level of analysis) are homogeneous (Felin & Hesterly, 2007). This is effectively what is done when prescribing that say, networks, rather than firms, are the central locus of capability.

Thus debates around the matter of hierarchical infinite regress mirror some of the discussions about the appropriate levels of analysis for studying organizational performance, for example, firm versus industry versus leadership/CEO effects (cf. Lieberson & O'Conner, 1972; McGahan & Porter, 1997; Rumelt, 1991).

ADDRESSING THE INFINITE REGRESS PROBLEM

We next outline three different ways through which infinite regress problems can be—and indeed, to a more limited extent, have been—addressed vis-à-vis understanding organizational capabilities: 1) a pragmatic approach, 2) an application domain approach, and 3) a real origin approach. To do this, we follow a stream of papers that build on philosophy of science to address theoretical problems in strategy (e.g., Durand, 2002; Foss & Hallberg, 2014; Powell, 2001, 2002, 2003; Tsang, 2006). We specifically build on existing research in the philosophy of science that addresses the role of assumptions in theory building (see Krajewski, 1977; Musgrave, 1981; Mäki, 2000; Nagel, 1961), which, as we will show, closely parallels central issues related to our discussion of infinite regress.

Any theory uses assumptions to delineate the boundaries and space of the phenomena that it seeks to explain (*explananda*), along with the relevant explanatory factors (*explanantia*) (Dubin, 1978; Krajewski, 1977; Poole & Van de Ven, 1989; Whetten, 1989; Lam, 2010; Mayer, 1999; Tsang, 2006). Theories and models in management also rely on *assumptions* to delineate the phenomena to be explained—the dependent variable(s) of interest: for example, competitive advantage—as well as the central explanatory factors—or independent variables: for example, capabilities—and the causal mechanisms that link the two together. According to Musgrave (1981), these underlying assumptions take one of three different forms depending on their function. First, theorists use assumptions to abstract from certain factors that they believe to have a negligible effect on the explained phenomenon. In constructing models of reality theorists engage in conjectures about the relative importance of different sets *explanantia* (or independent variables) in order to exclude those factors that are thought to be of less significance (negligibility assumptions). Second, assumptions may also be used to specify the domain of application for a theory. Theories are about and focused on

something—a unique domain—such as individual behavior, the behavior of objects in space, or in the case of strategy, the heterogeneity and performance of organizations. While attempts of course have been made to generate universal or general theories, nonetheless theories usually need to delineate a specific and contingent space of application. Theorists introduce assumptions that both specify and delimit the application of the theory to a domain (domain assumption). And third, assumptions may be used as heuristic devices to temporarily simplify the development of theory. For example, imagine that a theorist realizes that a particular assumption does not hold in any of the relevant domains (e.g., perfect information, in the case of economics). Despite this, the theorist might choose to keep the assumption in order to simplify the explanation, make it more tractable, and allow for a gradual approximation of the true causal pattern as the theory in question matures (heuristic assumption).

We argue that solutions to the infinite regress problem outlined above typically involve similar considerations as decisions of what type of assumptions to introduce when theorizing; that is, decisions about what aspects of the studied phenomena to abstract from, and those properties that can be treated in an idealized fashion. One can of course argue that theories should always, and without compromise, be realistic and provide a truthful account of origins and initial conditions of the explained phenomena (see Tsang, 2009). In the capability literature, as we will discuss, this is actually what we find to be dominant ambition. Although this line of reasoning has obvious merits as a long-term goal for theorizing, nonetheless when taken to its extreme it misses the crucial point that theory and models *always* and *inevitably* represent imperfect abstractions or idealizations of reality (Friedman, 1953; Musgrave, 1981; Mäki, 1994; Rasmusen, 1989). As aptly stated by Nelson and Winter,

> "theorists should aim to tell the truth in their theorizing, but they cannot aim to tell the whole truth. For to theorize is precisely to focus on those entities and relationships that are believed to be central to the phenomenon observed—and largely ignore the rest" (1982, p. 134).

Theories thus can be seen as maps of reality. Theories, like maps, don't represent the full reality itself. In fact, a "perfect" one-to-one map of reality, though very accurate, would be useless for practical purposes. Maps are only useful if they abstract away from reality and focus on central

aspects. Theorists are thus required to make tradeoffs between different elements of the theory being developed in order to further their explanatory aims, and to focus on the key elements and explanatory variables. Of course, some may argue that realism should have highest priority (Tsang, 2006), and others may point to the merits of predictive power (Friedman, 1953; Shugan, 2007), and yet others point to the importance of furthering creative thinking and ways of raising novel research questions (Kuhn, 1998; Weick, 1995). Regardless of these priorities, theories tend to only be useful if they—in map-like fashion—are simple and focus on a few key elements rather than trying to somehow capture reality itself.

Next we discuss three approaches to the infinite regress problem. We highlight first how infinite regress problems may be addressed pragmatically by simplifying, by developing heuristic assumptions about a theory's initial conditions. We then discuss how domain assumptions may be used for application domain approaches that form discipline-based boundary conditions for a theory. And finally we discuss how negligibility assumptions can provide a core motivation for the real origin approach.

The Pragmatic Approach to Infinite Regress

One approach to the infinite regress problem involves specifying particular initial conditions that are pragmatic in terms of simplicity and theoretical tractability. Factors such as the research-related costs and the practical aspects or reliability of going back to reconstruct the histories of organizations (including, say, past decisions, events, employee backgrounds) often lead to compromises that drive scholars to accept more proximate causal stopping points for understanding the origins of capability and to focus on more recent history and more readily-available data.[5] Theoretically the pragmatic approach to the infinite regress problem is perhaps most explicitly exemplified in transaction cost economics by the initial conditions stated by Oliver Williamson. Specifically, Williamson argues that for reasons of "expositional convenience," he begins his analysis with the initial condition that "in the

[5] For example, scholars may only have access to certain types of data or organizations, which then drives the decision of where to start the analysis of organizational capability. The availability of specific data of course isn't a very defensible approach to studying capabilities, though it undoubtedly plays some role in what strategy scholars have focused on (e.g., large public firms where financial performance data is readily available: Aldrich, 2006).

beginning there were markets" (1975, p. 20). While this initial condition and assumption is debatable (as criticized and discussed by Granovetter, 1985), it clearly constitutes an assumption that is made not necessarily to accurately depict the starting point of reality (or an actual historical chain of causally related events), but rather to provide the theory with an analytically clear and tractable initial condition and starting point that forms the foundation for further theorizing and prediction, specifically about the emergence of firms and organizational boundaries. In the words of Williamson, "the main reason for the statement of mine you quote ["in the beginning there were markets"] is that *you've got to start the analysis somewhere*. You could start with the neoclassical theory of markets and market failures and interpret hierarchies as a response to market failures. But a sociologist might start with hierarchies and hierarchical failures and interpret markets as a response to hierarchical failures" (Williamson in Hodgson & Gindis, 2007, p. 378).

An important point here is that the existence of the dependent variable—in the case of the theory of the firm this dependent variable is the firm itself (Coase, 1937)—cannot simply be assumed but must instead be explained. Thus Williamson starts with markets, a different organizational form, and then in turn seeks to explain the emergence of the firm (or hierarchy), another organizational form. Resource-based logic similarly cannot simply assume that a firm already possesses the resources that might confer a competitive advantage—the very resources it should seek to explain—as this doesn't solve the infinite regress problem but only raises questions about where those resources came from in the first place. Thus some resource-based approaches focus on the identification, purchase (in factor markets), accumulation, and development of resources and capabilities. This exemplifies another form of pragmatics where theorists are willing to sacrifice the realism of the theory in terms of depicting an actual historical chain of events in order to gain theoretical tractability, parsimony, or to economize on scarce research related resources.

It is worth noting that a significant part of the capability literature arguably breaks with the pattern found in transaction cost economics and the RBV (i.e., of initially assuming the opposite, or something distinctively different, of what the theory explains) by positing repetitive behavior, heterogeneity and capabilities all the way through the causal chain (cf. Jacobides & Winter, 2012).

The example of initial conditions in transaction cost economics raises questions about whether there are similar reasons for some of the formulations of initial conditions in capability theory (Argyres & Zenger, 2012). Statements, similar to that of Williamson (1975, p. 20), can in fact be found in seminal contributions to this literature. For example, Nelson and Winter state that "the idea that the immediate determinant of business behavior is 'habitual reaction' provides a *useful starting point* for evolutionary modeling" (1982, p. 142; also see Levitt & March, 1988). The focus on pragmatics and usefulness then provides one way to state initial conditions and start the analysis and theory development.

Pragmatic approaches to addressing infinite regress-related problems can thus, as in transaction cost economics and evolutionary economics, be seen as operational in the literature on capabilities where, for example, hierarchies of n^{th} order capabilities may provide a feasible (albeit abstract) answer to the question of where change originates from (see Collis, 1994; Helfat & Peteraf, 2011). Similarly, as highlighted by Collis (1994), a lexicographical ordering of capabilities at different levels provides an effective heuristic by which regress problems in n^{th} levels of capability can be made tractable. But, the notion of levels of n^{th} order capabilities can be too abstract for firms to readily invest in, though this intuition might broadly offer an interesting way of thinking about capability. The pragmatic approach is not only visible in the n^{th} order regress problem but also in experiential and hierarchical regress. For example, theories of dynamic capability have been defended against accusations of being unclear—about the nature of key concepts and causal relationships—by pointing out that the theory is still "in its infancy" and thus should be given extra leeway as it matures (Helfat & Winter, 2009, p. 92). According to this approach, regress problems arising from unclear specification of the origin of capability may thus be dismissed until the theory is considered mature enough.

The problem with pragmatics. The problems faced by the pragmatically oriented approach to infinite regress relate to the potential arbitrariness of initial conditions that this approach can give rise to. The selection of certain initial conditions for the sole purpose of "providing a starting point" (as suggested by Williamson above) or that particular initial conditions are "useful" for a given purpose,

of course does not guarantee that these conditions are in fact well suited for explaining phenomena beyond the narrow ones that the theorist had in mind when beginning the construction of the theory. Furthermore, it is not clear if the pragmatic solution to infinite regress and associated explanations will provide a satisfactory causal story that in a credible way accounts for the explained phenomenon. A good example is Friedman's (1953) "as if" defense of rationality assumptions in economics, that is, the assumption that economic actors behave "as if" they are maximizing profits by equating marginal cost with marginal revenue. While such an assumption might be well suited for the practical purposes Friedman had in mind, for example predicting long-run market equilibria, it may be poorly suited for addressing many other phenomena, such as micro-level decision making processes or firm behavior. And, as discussed by others (e.g., Hayek, 1945), the strong god-like rationality assumption and focus of equilibrium of course tells us very little, if anything, about the underlying processes and dynamics associated with markets, such as the creation of value and the emergence of potential equilibria. Hence, adopting causal starting points based solely on apparent pragmatics, while useful in some instances, can also prove to have a substantial downside when theories seek to include new concepts and address new empirical phenomena that were not originally addressed by the theory.

The Application Domain Approach to Infinite Regress

A second approach to the infinite regress problem involves "cutting off" the chain of explanatory factors at a commonly accepted disciplinary boundary or empirical domain. By convention, theories and disciplines are often specifically developed to explain phenomena within some domain or boundary, for example at a certain level of analysis (e.g., individual or organization), while leaving phenomena within other domains and levels to be explained by other disciplines (Mäki, 2009). A traditional example of this is the division of labor that might exist between more micro disciplines such as psychology, focused on individuals, versus more macro disciplines, such as sociology, focused on social systems and collectives. More generally, this reflects the tendency among scholars to focus on the explanatory factors and initial conditions that by convention are considered appropriate within the particular discipline (Foss & Hallberg, 2016).

The notion that disciplinary domains play an important role for delineating explanations—and thus function as a means of dealing with the infinite regress problem—has manifest itself in various ways in strategy research. For example, Priem and Butler's (2001) critique of the RBV highlights how the theory does not include a theory of value creation (i.e., consumer utility). Makadok and Coff (2002), in turn, defend the RBV by arguing that a theory of consumer utility could not reasonably be viewed as part of the explanatory domain of the RBV (or, more broadly, strategic management), but rather as the explanatory domain of marketing and consumer behavior. The question in this case then concerns whether a certain theory should be extended to include factors that have traditionally been viewed as part of neighboring fields or disciplines. As Makadok and Coff point out, "if we were to expand the RBV to encompass marketing, why stop there? Even in such an expanded version of RBV, there would still be important parameters and constructs that would be defined exogenously and taken as given" (2002, p. 12). The application domain oriented approach to infinite regress, then, prescribes a division of labor among researchers and theories based on dividing lines between different academic disciplines or fields where each theory is given "causal stopping points" and boundaries by academic convention. It may of course be argued that disciplinary stopping points are merely artificial and historical, and thus they perhaps should be questioned as they stand in the way of identifying the true cause or origin of something. However, there is arguably also value in having a multitude of fundamentally different and potentially irreconcilable explanatory perspectives (e.g., the perspective of the focal firm, the perspective of the industry, the perspective of the consumer). In addition to reducing the possibility for specialization among researchers, much of this richness might be lost if the aim was to always maximize reduction and unification to arrive at explanations at a supposedly more fundamental level of analysis (Mäki, 2009).

But, instances of what we term the application domain approach to solving the infinite regress problem relate to our previous discussion of n^{th} levels of (dynamic) capabilities. For example, Collis argues that it may be possible to sidestep problems of infinite regress by denying "the importance of capabilities by arguing that competitive advantage resides only in current possession of preferential product market positions" (1994, p. 149). In other words, perceived problems of infinite regress are

dependent on the particular theoretical perspective that is adopted and how disciplinary boundaries are formed in relation to theoretical perspectives. This "division of labor" among researchers suggests disciplinary-based stopping points that play an important role in addressing regress problems. For example, according to Winter, theoretical concepts in the capability literature, such as "routines," are effective as long as they allow for particular forms of empirical prediction. This may be despite the inability of the "routine" concept to capture phenomena such as "the inner workings of a creative mind, or the subtleties of organizational politics at the highest level" (2011, p. 260). Such phenomena are then, in essence, said to be outside the application domain of capability theory and may instead be included in the application domain of other theories or disciplines.

The problem with a focus on application domain. The problem faced by proponents of the application domain oriented approach to the infinite regress problem is related to the loss of explanatory power from not including potentially relevant "outside" (though perhaps highly important) factors in discipline-specific theories. After all, true, real, or even pragmatically useful causal stopping points do not necessarily correspond to conventional disciplinary boundaries. Hence, in situations where there are real and significant factors that are left unaccounted for because of perceived disciplinary boundaries, this might affect the precision and robustness of models. For example, related to the abovementioned debate on whether the RBV should include a theory of consumer utility, it has been argued that heterogeneous consumer preferences in fact do affect resource value and thus competitive advantage (Priem, 2007). Of course, this has led others to develop "demand"-based theories of strategy (e.g., Adner, 2002). Indeed, many of the extant debates about the nature of capabilities hinge on the issue of disciplinary boundaries (cf. Felin & Foss, 2011; Winter, 2012).

The Real Origin Approach to Infinite Regress

A third approach to the infinite regress problem associated with different conceptions of capabilities involves identifying what might be termed the true, fundamental or "real" origins of the phenomenon to be explained. There is of course likely to be much debate about what we can in fact call a real origin—why one thing rather than another constitutes a real origin (or why one thing, rather than

another, has a disproportionate affect on the development of capabilities). For example, in the social sciences, methodological individualists commonly argue that social phenomena should largely be explained at the level of the individual since social phenomena emerge through—or are constituted by—the aggregation and interaction of individual choices and behavior (Elster, 1989; Udehn, 2001). On the other hand, methodological collectivists typically argue that individual choice and behavior should be explained at the social, cultural or environmental level, since individual action, in most cases, is embedded in social structures, cultures and contexts that pre-date the individual's existence, choice and behavior (cf. Barney & Felin, 2013). These types of a priori, theoretical commitments are especially pertinent since the standard scientific method does not test the realism of the assumptions that a theory relies on (Lam, 2010; Tsang, 2006).

The real origins approach to the infinite regress problem consists of pointing to certain factors as being more foundational, reflecting a *real* initial condition and stopping point in the causal history of the explained phenomenon. For example, in response to scholars arguing that capability originates in evolutionary experience and repetition (Nelson & Winter, 1982), Felin and Foss (2011) argue that capability must have endogenous origins (i.e., residing, perhaps in latent form, within individuals) since experience and repetition cannot provide real initial conditions for capability without including some notion of the nature and heterogeneity of the individuals that are experiencing and repeating (cf. Anand et al., 2015). This argument may in turn be contrasted with the directly opposed argument that the real origin of capability must reside at the interfirm level since individual firms are too small to house all the necessary knowledge (e.g., Dyer & Singh, 1998), thus making networks, for example, the locus of knowledge (Kogut, 2000).

The real origin approach is the most common way of addressing the infinite regress problem—though often rhetorically—when explaining capabilities. While many papers do not address infinite regress problems *per se*, at least head-on, the real origin approach is typically invoked by focusing on a particular origin of capability—sometimes with associated control variables to account for alternative explanations. Proposed origins may involve historical antecedents, experiences, serendipity, idiosyncratic resources, luck, information, and managerial cognition (e.g., Ahuja &

Katila, 2004; Arend, 2015; Barney, 1986; Denrell, Fang, & Winter, 2003; Cockburn, Henderson, & Stern, 2000; Helfat & Lieberman, 2002; Maritan & Peteraf, 2011). But real origins also relate to the aforementioned issue of n^{th} level regress. For example, both Winter (2003) and Arend (2015) propose that there are real stopping points in the n^{th} level regress of (dynamic) capabilities based on the time and resources needed to build dynamic capabilities relative the number of times the capability can be used in a given time period. Others, such as Collis (1994) and Peteraf et al. (2013), have suggested that real stopping point in the n^{th} order regress can be identified based on a contingency framework where the value of different (n^{th} level) capabilities is dependent on the specific context (time and industry) in which the capability is deployed. For example, the real origin of capability might have to do with where one's competitors are (relatively) in terms of a learning curve or the lifecycle or stage of a technology (Helfat & Peteraf, 2003).

The problem with real origins. The problem of the real origins approach is related to *time* and *levels of analysis*. Simply put, most social phenomena have antecedents, causal or not, which can be cumulative or composite in nature. Hence, claiming to have identified *the* real initial conditions for explaining a capability (or any phenomenon) is susceptible to the criticism that there undoubtedly are additional, unaccounted explanatory factors involved, specifically factors that pre-date the suggested explanation itself. In philosophy of science, this reflects the general notion that scientific knowledge is fallible and subject to revision upon further investigation (Lakatos, 1970; Popper, 1959). It is of course difficult—if not impossible—to exclude the possibility that more refined explanations, including a wholly different set of explanatory variables, might be identified. For example, while individuals might constitute an appealing causal stopping point for some in the social sciences, individuals can also be seen as products of social interaction and their environments.

RESEARCH IMPLICATIONS

The true or real origin of capability (and other phenomena) may indeed be traced back historically to the big bang or some other, early cosmological event. While the identification of such ultimate origins could be interesting, we do not believe that this is a helpful place to start if the purpose is to address infinite regress problems in strategy management theory. In other words, we do not think it is

helpful to address infinite regress problems solely based on a notion that theories should be realistic and determinant (see Musgrave, 1981), or that they should cover the complete causal history of the studied phenomena (at all levels of analysis).[6] That being said, we also believe that realism is an important *long-term* objective for management theorizing that needs to be balanced against other pragmatic and domain related considerations when defining the initial conditions and causal stopping points of theory. Thus, based on our discussion of infinite regress in the organizational capability literature, we next outline three research heuristics that summarize our main insights, particularly in terms of specific implications for future theory development related to organizational capabilities and strategy. These research heuristics suggest different pragmatic and domain related aspects of theorizing in management that we believe should be considered together with realism in order to avoid infinite regress problems.

Initial conditions in management research should represent proximate and decision-oriented punctuating points. A natural starting point for addressing the pervasive infinite regress problem in management research is to focus on the decision-making associated with designing or building capabilities. A practical or pragmatic focus on how managers in fact might design and build capabilities represents a form of more proximate and "forward-looking" theorizing that attempts to offer actionable predictions of how capabilities are built—without placing the sole explanatory burden on long-run historical factors (e.g., serendipity, experience, history, path-dependence, structural inertia, etc.). Several contributions to capability theory that build strongly on evolutionary economic theory offer illustrative examples of this heuristic, particularly approaches that focus on luck (e.g., Denrell et al., 2003). That is, luck or serendipity-oriented approaches to capability, almost by definition, offer no forward-looking guidance about how organizations might develop a capability. Such theories are by their very design unable to generate predictions and in a meaningful way guide managerial decision-making, other than in the crudest of terms (e.g., suggesting that planning is useless given pervasive uncertainty). But such theories ultimately lead to an experiential regress, as

[6] According to Kuhn (1998, p. 103), a good theory not only involves an accurate reflection of reality, but also predictive accuracy, logical consistency, broad scope, simplicity, and fruitfulness for new research findings.

somehow the "arrival" of the lucky needs to be addressed (Andriani & Cattani, 2016). These considerations are particularly important in a discipline such as strategic management that aims to provide practical implications for entrepreneurs, managers and policy makers. Certain forms of equilibrium analysis and game theory may provide one important tool towards this end (see Gans & Ryall, 2017). Another is the behavioral approach to management and strategic decision-making (see Gavetti, 2012; Powell et al., 2012). Of course, our call here isn't for any kind of "rules for riches" (Rumelt, Schendel, & Teece, 1994). But theories of capability can nonetheless feature practical advice for how to organize and design capabilities (see Adner & Helfat, 2003; Argyres et al., 2012; Castanias & Helfat, 2001).

This shift is already happening in the literature, though it hasn't explicitly been linked to the above issues related to infinite regress. For example, scholars have looked at the appropriate structures and designs that maximize decision-making, capability building and performance in organizations (e.g., Gulati, Puranam & Tushman, 2012; Knudsen & Levinthal, 2007; Zenger et al., 2011). The opportunities to link decision-making and structure with the domain of capabilities provides a significant opportunity for future work, which naturally deals with some of the infinite regress issues outlined in this paper. Past studies on organizational structure (e.g., Foss, 2003) might indeed be reinterpreted as precisely the type of studies that explicate how managerial interventions in organization structure impact the emergence and development of capabilities.

Another promising way for the field to address the infinite regress problem is to pay more attention to how economic decision-making or agency and history interact (Hallberg, 2015). For example, the "learning to contract" literature touches on both historical and decision-oriented aspects of capabilities (Argyres *et al*., 2012; Mayer & Argyres, 2004), where past contractual interactions provide a template or capability for future-oriented behavior. Thus the agentic and intentional aspects of capability can be brought to the fore. This has also been center stage in the literature on human capital and strategy (e.g., Campbell et al., 2012; Nickerson & Zenger, 2008). That is, capabilities can be closely linked to who is in the organization (cf. Felin & Foss, 2005), with special attention on the aggregate and emergent interactions of human capital in the realization of organizational capabilities.

Human capital of course might be seen as an instance of a more general opportunity where managers "purposefully create or modify a firm's resource base" (Helfat et al., 2007, p. 1), by making choices about the divestment or acquisition of particular individuals (Moliterno & Wiersema, 2007). Others have studied how capabilities involve the interplay between individuals who both create *and* capture value (Coff, 2010; Hallberg, 2017). These findings show that individuals matter for organizational capabilities (Campbell, Ganco, Franco, & Agarwal, 2010), though some settings appear to be more resilient to the mobility of individuals, even star performers (Groysberg, Lee, & Nanda, 2008).

Initial conditions in management research should be distinctively different from the explanandum. In addition to the emphasis placed on realism and logical consistency in previous research on initial conditions (see Arend, 2015; Winter, 2003), we argue that addressing infinite regress problems also involves important tradeoffs where pragmatic and domain-related questions should play a major role. Specifically, in some cases it can be worth sacrificing descriptive realism (or even predictive accuracy) to gain a more useful specification of initial conditions. This can be done by stating initial conditions that are different or opposite from that which is to be explained (as discussed above: how *hierarchies* emerge out of *markets* in transaction cost economics). This allows the theory to more clearly specify how the dependent variable or outcome of interest emerges under a defined set of conditions, rather than simply assuming the prior existence of the variable of interest. This also provides clear implications concerning how managers can go about designing or building capabilities since the causal mechanism is clearly exposed. The opposite practice of simply predicting "more of the same" or "status quo" along a path-dependent trajectory does very little to highlight the specific ingredients (or recipe) that decision-makers need to pay attention to in order to take actions that may change the course of events in a deliberately chosen direction (cf. Winter, 2012). Our case study of regress problems in the capability literature provides several examples of this tendency in capability theory to focus on the history of organizations rather than on the *choices* that originated that history (e.g., Denrell, Fang, & Winter, 2003; Winter, 2003, etc.). Instead, to clearly explain the origins of something—like a capability—theorists need to ensure that the explanation actually tells us how, or under what conditions, capability emerges out of something else. In other words, it is

advisable for scholars to try to avoid "turtles-all-the-way-down"-type explanations where the actual reasons for the chosen behavior are left out of the explanation or their prior existence is simply assumed rather than explained (also see Vergne & Durand, 2010, 2011 for related discussion). While this requirement seems to be met, for example, in theories such as transaction cost economics (where hierarchy emerges out of non-hierarchy when asset specificity and additional conditions are present) and the RBV (heterogeneity emerges out of non-heterogeneity when causal ambiguity/asymmetric information and additional conditions are present), the capability literature continues to assume the very thing that needs to be explained by focusing on the historical and experiential origins of capability.

One way to solve the infinite regress problem of simply assuming the pre-existence of explanatory variables (such as capabilities) is to think about how these variables can somehow be "grown" through theoretical and empirical analysis. This intuition comes from those who have called for a "generative" approach to social science (cf. Cederman, 2005), which readily can be applied to explaining capabilities as well. The central insight is that explanation ought to be equivalent to trying to grow something. This is aptly captured by Epstein's quip: "if you didn't grow it, you didn't explain it" (2007, p. 8). In other words, if we don't understand the underlying initial conditions, constituent elements, their interactions, enabling mechanisms and structures, then we are unlikely to be able to offer an account of how to grow or build something. This admittedly is a modeling-oriented conception of the scientific enterprise, conducive to theory building through, for example, agent-based simulation. However, we think it provides a helpful way of solving some of the sticky quandaries associated with infinite regress, and can serve as the basis for developing more forward-looking and decision-oriented theories of capability, strategy and management.

Initial conditions in management research should match the unique explanatory aim of the theory in question. The explanatory aim of theories should be given greater weight in the specification of initial conditions. Naturally, when explaining firms' long-term survival and adaptation (e.g., Nelson & Winter, 1982; Hannan & Freeman, 1977, etc.) theorists face a different type of challenge than when the explanatory aim is to predict sustained performance variation and

competitive advantage (e.g., Wernerfelt, 1984; Lippman & Rumelt, 1982, etc.). This domain-related difference between theories in terms of explanatory aims and *explanandum* should be carefully considered when specifying initial conditions. Differences in explanatory aims are of specific importance in management research because the discipline draws heavily on a number of very different source disciplines (e.g., economics, sociology, psychology, etc.), which themselves have very different explanatory aims and assumptions (Foss & Hallberg, 2016). For example, typical assumptions from evolutionary economics related to path-dependence and structural inertia—which might be effective for modeling how a population of organizations develops over an extended time period—may not be suitable for the quite different explanatory aim of understanding the choices of entrepreneurs and managers as they develop and seek to grow organizational capabilities in the short term.[7] Hence, in the case of capability theory, there is presently a mismatch between the initial conditions derived from evolutionary economics (which in turn is inspired by evolutionary theory in biology, and focused on variation-selection-retention at the level of populations) and the explanatory aim of management scholars and practitioners to arrive at explanatory factors that are economically relevant (for particular organizations, rather than populations) and at least in principle under managerial control.

Here we might apply the evolutionary biologist Ernst Mayr's (1961) simple framework of proximate versus ultimate causes of explanation. Naturally there are many long-run, population-level explanations of the survival of species, perhaps providing the "ultimate" explanation—and it is this intuition that in fact has shaped capabilities research as well (Winter, 2012). But the more proximate, developmental and organization-specific factors (cf. Felin, 2012)—a kin to our idea of the "growth" of capabilities, discussed above—are perhaps more important to management scholars. It is these proximate causes that are more actionable for managers, and they also don't lead to the type of

[7] Another example concerns how the RBV has drawn extensively from economics despite having quite different explanatory aims (Rumelt, Schendel, & Teece, 1991). Theories that explain the emergence of market equilibria may benefit from a different specification of initial conditions than theories that aim to explain the dynamics and emergence of organizational novelty, heterogeneity, and competitive advantage. This may explain why strategy scholars have gradually distanced themselves from core economics concepts such opportunity cost and equilibrium (e.g., Lippman & Rumelt, 2003).

reductio ad absurdum suggested by the infinite regress problem. In sum, taking disciplinary divides into account when defining initial conditions might be an important vehicle for making the reasons behind these tradeoffs clearer, as illustrated by the widespread application of evolutionary economic theory to the context of capability theory. And this in turn might influence how academic debates develop, what gets priority in those debates, and ultimately what direction theory development takes.

CONCLUSION

In this essay we have highlighted how various forms of the infinite regress problem manifest themselves in strategy and management research. We have used the capability literature as our example. Past work has primarily focused on the n^{th} order regress problem (e.g., Collis, 1994; Winter, 2003). But we also outline two additional forms of infinite regress: experiential regress and hierarchical regress. Based on the case of infinite regress in organizational capabilities, we identify three different approaches that can be used by researchers to address these problems: a pragmatic approach, an application domain approach, and a real origin approach. We find that a more detailed evaluation of the different forms that infinite regress can take (n^{th} level, experiential, hierarchical) and the possible approaches to dealing with them can be useful for highlighting less acknowledged, but desirable, properties of theory in strategy research. First, scholars should to a greater extent seek to balance the pursuit of realism in explanation against other desirable theoretical properties that allow for testable, novel and counterintuitive predictions that may serve as a foundation for explaining organizational decision-making and behavior. Second, management scholars should build theories with clearly stated initial conditions that are distinctly different from what the theory seeks to explain, rather than merely assuming the pre-existence of these concepts. As we have discussed above, this property of theorizing might raise productive, future-oriented questions, particularly in the case of some contemporary theories that suffer from an overreliance on underspecified causal mechanisms such as structural inertia and path-dependence (see Vergne & Durand, 2010, 2011). Third, the particular explanatory aim and practical relevance of theories should be given greater weight in the specification of initial conditions and the matching of a particular type of infinite regress problems to its relevant solution.

In sum, we make three related contributions: First, we identify the problematic properties of the initial conditions stated in capability theory (path-dependence, serendipity, experience, history) and show how these properties may lead to different forms of infinite regress. Second, we develop a more nuanced understanding of the infinite regress problem in strategy by arguing that this problem should not, as assumed in much of the previous literature, only be addressed in terms of identifying the real origins of capability, but that it should also take into account pragmatic considerations and the intended application domain of the theory. And finally, we contribute with concrete research heuristics or steps for avoiding infinite regress problems in the specification of initial conditions. Our hope is that this essay leads scholars to more carefully consider the problem of infinite regress in their own theoretical and empirical work. And more importantly, we hope that this essay offers productive ways for dealing with the infinite regress issue—not just in the context of understanding organizational capabilities, but also more broadly in the context of strategy and management research.

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