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In search of missing time: A review of the study of time in leadership research

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ABSTRACT

Many studies describe leadership as a dynamic process. However, few examine the passage of time as a critical dimension of that dynamism. This article illuminates this knowledge gap by conducting a systematic review of empirical studies on temporal effects of leadership to identify if and how time has been considered as a factor. After synthesizing key findings from the review, the article discusses methodological implications. We propose that a computational science approach, particularly agent-based modeling, is a fruitful path for future leadership research. This article contributes to leadership scholarship by shedding light on a missing variable (time) and offering a novel way to investigate the temporal, dynamic, emergent, and recursive aspects of leadership. We demonstrate the usefulness of agent-based modeling with an example of leader-member exchange relationship development.

Introduction

As the scientific study of leadership evolves, the concept of time is increasingly discussed as a variable of interest. Scholars recognize that time plays a vital yet poorly studied role in the process of leadership. It takes time to become a leader, to enact leadership, and to be perceived by others as a leader (Day, 2014; Shamir, 2011). A number of leadership constructs (e.g., leader behavior, leader development, leader emergence, leader-follower relationships) involve temporal considerations. Examples include events (Ballinger & Rockmann, 2010), ordering (Casimir, 2001), time lags (Day, 2014), and proximal/distal outcomes (Day & Dragoni, 2015). Such temporal aspects reflect the processual nature of change and development associated with leadership (Gollub & Reichardt, 1987).

While many studies describe leadership as a dynamic process, few investigate with specificity the passage of time as a critical dimension of that dynamism (Bluedorn & Jaussi, 2008; Day, 2014; Shamir, 2011). This lack of consideration is reflected in both conceptual and methodological shortcomings of current leadership studies. In his theoretical paper, Shamir argued that "most empirical studies of leadership, including longitudinal field studies, [did] not contain much information about the effects of time on leadership phenomena" (2011, p. 307) and that leadership theories did not specify the time it would take for leader characteristics to have an effect on outcomes. Similarly, Kozlowski, Watola, Nowakowski, Kim, and Botero (2009) posited that even though current leadership theories captured process-like functions such as planning, organizing, monitoring, and acting, these functions were static in nature because the effects of leadership were not theorized to change over time. This gap is important because without addressing these temporal effects, we have few answers to questions such as when leader characteristics and behaviors can have an effect on follower attributes and organizational performance, whether perceptions of leaders are stable or how they change over time, how leader-member exchange relationships are developed and maintained, or how leaders themselves change and develop (Day, 2014).

Methodologically, the majority of leadership studies have been static, cross-sectional, and heavily rely on survey data (Dinh et al., 2014; Dulebohn, Bommer, Liden, Brouer, & Ferris, 2012; Kozlowski et al., 2009). In Dinh et al.'s (2014) content analysis, the authors found that among the 752 leadership articles published in core journals between 2000 and September 2012, the vast majority (74%) of theoretical research stressed compilation forms of emergence—"a fundamental change in qualities and functions of the sub-unit as aggregation from lower to higher levels occurs" (Dinh et al., 2014, p. 43). However, empirical studies utilizing compilational emergence only accounted for 27% of all quantitative research. They attributed this misalignment to researchers' failure to attend to important effects that time has on leadership and organizations, as well as failure to adopt research methods that better align with theory. However, even in longitudinal studies that do consider temporal effects, data are usually collected over two or three points in time to cover a time period of less than a year (Dulebohn et al., 2012). While longitudinal design helps to assess if and how much

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change has occurred, it does not contribute to theoretical advancement on the impact of time on leadership phenomena (Shamir, 2011). Longitudinal studies also fail to account for emergent phenomena that may arise through repeated interactions over time and risk type I and type II errors. Type I errors occur when too few (or insufficiently spaced) measures suggest a pattern that, when data are viewed over a longer time frame, reveal a much different pattern. Type II errors result when a study concludes no change occurred when in fact it did, however, a longer time scale was required to recognize it (Day, 2014).

In this review paper, we build on prior reviews (Bluedorn & Jaussi, 2008; Day, 2014; Fischer, Dietz, & Antonakis, 2017; George & Jones, 2000; Mitchell & James, 2001; Shamir, 2011; Shipp & Cole, 2015; Zaheer, Albert, & Zaheer, 1999) to systematically address the knowledge gap about the role of time in leadership. For example, we extend Shipp and Cole (2015) by considering methodological issues concerning the study of time in micro organizational research. We also build on Fischer et al.' (2017) discussion of leadership processes as a cause-mediator-effect logic, arguing that mediation studies represent only one way of studying temporal effects and that not every mediation study actually captures the flow of time (as supported by the authors' finding that only a third of quantitative-empirical studies included time lags). Our review also suggests that traditional statistical methods may constrain the field by imposing linear and variable-based ways of thinking, which are better suited for some kinds of research questions than others. As such, we review a smaller sample of leadership studies and address a methodological gap in the extant literature. Our review contributes to the leadership literature by drawing attention to the different areas of time that have been well- or not well-studied, as well as by shifting the focus of research design assumptions away from linear and to nonlinear, emergent thinking. We conclude by proposing a relatively new methodological approach (agent-based modeling) to overcome limitations of existing methodologies.

Systematic review and coding

Our review began with a search for original empirical leadership studies in the top management and psychology journals. Consulting Table 1 in Gardner, Lowe, Moss, Mahoney, and Cogliser' (2010) review, we selected *The Academy of Management Journal*, *Administrative Science Quarterly*, *Journal of Applied Psychology*, *Personnel Psychology*, *Journal of Leadership and Organizational Studies*, *Journal of Management*, *Journal of Management Studies*, *Journal of Organizational Behavior*, *Leadership*, *Leadership and Organization Development*, *Leadership Quarterly*, *Organization Science*, *Organization Studies*, *Organizational Behavior and Human Decision Processes*, and *Strategic Management Journal*. We excluded *The Academy of Management Review* because it does not publish articles with data. We also included the *Journal of Public Administration Review and Theory* to ensure that studies from all sectors (public, private, nonprofit) would be included. To identify studies that empirically capture the effects of time, we searched for *lead** as well as one of the following keywords in the title of the article: *chang**, *emerg**, *dynamic**, *time*, *temporal*, and *longitudinal*. To ensure that the studies contain data and analyses, we also searched if at least one of the following keywords was present anywhere in the article: *design*, *method**, *sample*, and *analy**. We limited our results to articles published in or before December 2016. This search yielded 122 results.

To further confirm that the articles we found were relevant to the purpose of this review, the two coauthors independently read the abstracts of the 122 articles and coded whether each article captured any kind of temporal effect of leadership. Expected agreement due to chance between the two coders was 52.58%; the authors agreed 96.72% of the time. Cohen's *Kappa* was higher than the commonly accepted threshold of 0.80 ($\kappa = 0.93$, $S.E. = 0.03$, $T = 10.31$, $p < 0.001$), suggesting that this agreement was substantially better than chance. The most common reasons for exclusion of articles were that they were either theoretical in nature or did not capture temporal effects. For example, many research studies on organizational change, transformational leadership, or the role of leadership during change initiatives contained the search keywords but did not examine the effects of time. Others measured independent variables, mediators, and dependent variables at the same time point. We then discussed and resolved differences in coding and proceeded to review the resulting 45 articles. Two of the papers each conducted two studies, bringing the total number of studies reviewed to 47. The reviewed articles are indicated with an asterisk in the References section.

We performed a content analysis following the process reported by Gardner et al. (2010) and Dinh et al. (2014). The first author and four undergraduate students independently coded these articles by journal

Table 1
Summary of content analysis.

Total number of studies	47	(45 articles, two of which each conducted two studies)				
(*some categories below add up to more or < 47, e.g., articles using multiple analytical methods, addressing multiple units of analysis, etc.*)						
Types of studies	Longitudinal	Longitudinal				
	Real time	Archival				
	43	4				
Time range	< =4 weeks	> 4 to < 12 weeks	12 to < 24 weeks	6–12 months	> 12–24 months	> 24 months
	7	8	8	3	6	15
Data collection						
Frequency	Two-wave	Three-wave	Four-wave	> 4		
	21	9	3	14		
Monge's typology	Continuity	Magnitude	Rate of change	Trend	Periodicity	Duration
Stated	1	1	0	2	0	0
Implied	6	0	1	20	0	0
Other temporal						
Dimensions	Pattern	Trajectory	Rhythm	Cycle	Oscillation	
	1	4	0	1	0	
Theory-based time lags	Yes	No				
	6	37				
Time conceptualized as	Focal Construct	Medium				
	1	46				
Analytical method	HLM	Growth curve	Other quantitative	Qualitative		
	21	3	19	14		
Stability assumptions						
Addressed	Yes	No				
	9	36				
Unit of analysis	Individual	Group	Organization			
	34	32	6			