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The time has come to study dynamics at work

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Author note

We would like to dedicate this special issue to Robert A. Roe, who was co-guest editor of this special issue but passed away in 2016. As a leading scholar in the study of dynamic phenomena at the workplace, Robert was an inspiration for many researchers. Throughout his career, he adamantly pleaded for increased attention to studying workplace phenomena as dynamic processes. He received international recognition for his work and helped lay the foundation for European IO-psychology as a founder of the European Network of Organisational and Work Psychologists (ENOP) and the European Association of Work and Organizational Psychology (EAWOP). We hope that this special issue continues his legacy and inspires researchers for years to come.

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The time has come to study dynamics at work

Abstract

Most, if not all, workplace phenomena are dynamic, meaning that they emerge, evolve, and dissolve over time. Yet, the role of time is commonly overlooked in OB literature. This special issue showcases how a temporal process-oriented lens can be used to study dynamics of workplace phenomena. In this editorial, we define the term dynamics, arguing that research on workplace dynamics focuses on how within-person (or more broadly, within-unit) processes unfold over time. Moreover, we zoom in on the diverse roles of time, illustrating the rich diversity in research on workplace dynamics, and we highlight three specific challenges for scholars wanting to pursue this line of research. We conclude that the time has come to move from a differential to a temporal and process-oriented perspective, allowing us to understand *what* happens, *how* things happen, and *why* things happen at the workplace.

Keywords: workplace dynamics, time, within-person, processes

Word count: 2583 words (excluding references)

The time has come to study dynamics at work

Nearly all workplace phenomena are dynamic. Newcomers' commitment levels change as a function of their tenure to their new organization (Solinger, Olffen, Roe, & Hofmans, 2013), perceptions of psychological contract breach fluctuate on a weekly or daily basis (Achnak, Griep, & Vantilborgh, 2018; Vantilborgh, Bidee, Pepermans, Griep, & Hofmans, 2016), and even constructs that are believed to be largely stable across time, such as personality-related behaviors, affects, and cognitions, have recently been shown to vary roughly as much within as between individuals, with such within-person fluctuations happening over the course of years (Wille, Hofmans, Feys, & De Fruyt, 2014), months, and even over the course of a single day (Debusscher, Hofmans, & De Fruyt, 2017; Fleeson, 2001). As these examples demonstrate, most, if not all, workplace phenomena are dynamic, making time a salient factor when studying those workplace phenomena. Yet, in the organizational literature, the role of time is hardly ever explicated (Roe, 2008).

Part of the reason why research on dynamics of workplace phenomena is scarce is that for a long time the field has been dominated by cross-sectional studies (Roe, 2005, 2008). As a consequence of the differential perspective implied by those cross-sectional studies, scholars have typically investigated *which* variables relate to each other, rather than studying *how* those variables and their interrelationships unfold over time. This is unfortunate because studying how phenomena and relationships emerge, evolve, and change over time is crucial for a good understanding of those phenomena and their relationships (Sonnentag, 2012). During the last two decades, however, awareness on this issue has grown, resulting in the field shifting from a differential to a temporal and process-oriented perspective, with such a perspective enabling us to understand *what* happens, *how* things happen, and *why* things happen at the workplace.

Although a temporal and process-oriented perspective on workplace dynamics offers exciting new avenues for research, it also creates challenges that may discourage researchers from pursuing this line of research (Ancona & Goodman, 2001). With this special issue we aim to inspire academics to invest in studying the dynamics of workplace phenomena by showcasing the rich diversity in topics, methods, and analytical approaches that can be used to this end. Moreover, this issue demonstrates how the insights gained from dynamic research allow for a more realistic representation of what actually happens at work. In our editorial, we will briefly define what research on dynamics of phenomena entails, highlighting the important and diverse roles of time. We will close off by directing attention to specific challenges and opportunities that scholars interested in dynamic phenomena may encounter.

Defining dynamics at work

Despite the frequent use of the term “dynamics”, an agreed definition is lacking. Roe (2008) defined dynamics as the pattern of changes in phenomena over time. He argues that workplace phenomena have an onset and offset, between which fluctuations take place. For example, the experience of workplace stress has a clear onset (e.g., learning that there will be layoffs in your company), trajectory (e.g., a steep increase in stress followed by a stable period and a slow decrease), and an offset (e.g., concluding that you will not lose your job). According to Roe (2008), the goal for temporal research is thus to identify the dynamic features of phenomena (e.g., what is the duration of the stress experience), study temporal relations (e.g., how does the trajectory of stress relate to the trajectory of job performance), and long-term stability and change (e.g., are stress trajectories of current employees different from those of employees 40 years ago). Alternatively, Wang, Zhou, and Zhang (2016) view a dynamic phenomenon as one whose state changes from one point in time to the next according to certain

rules; a position which strongly aligns with a dynamic systems perspective (Westaby, Pfaff, & Redding, 2014). Whereas Wang et al.'s (2016) conceptualization is different from Roe's (2008) definition, it is clear that both conceptualizations share a strong emphasis on change over time.

In this editorial, we expand upon these definitions, arguing that dynamic research is characterized by three core elements. First, research on dynamic phenomena focuses on how *processes* unfold over time. A process can refer to a single variable, such as the trajectory of stress over time, or to multiple variables, such as a mediation process or a dynamic system. Second, in dynamic research *time* plays a key role, and, as we will explain further on, time can be taken into account in various ways. Third, research on dynamic phenomena pays particular attention to *within-person* (or more generally within-unit) processes, albeit the focus can also be on describing between-person differences in dynamic processes or on a mixture of within- and between-person differences. In sum, dynamic workplace phenomena can refer to temporal processes within a single individual (intraindividual process) as well as between individuals (interindividual process). Moreover, these temporal processes can involve a single variable (e.g., the trajectory of job performance over time) or multiple variables (e.g., the covariation between the trajectory of job performance and the trajectory of job satisfaction over time). Combining these two dimensions yields a two-by-two categorization of dynamic phenomena, showcasing the diversity of topics that falls within this line of research (see Figure 1).

INSERT FIGURE 1 ABOUT HERE

The role of time

As mentioned before, time plays a crucial role when studying dynamic phenomena. Sonnentag (2012) argued that time can factor in in different ways, including time-related constructs, time-sensitive processes, time lags, and temporal contexts. In what follows, we outline several ways to deal with the role of time, each time describing how time is treated by the papers in the special issue.

Temporal precedence. One way of taking time into account is to investigate temporal precedence. Determining how variables are causally ordered in time has typically been done at the between-person level, for example using cross-lagged panel studies (Roe, 2008). Such studies often adopt a longitudinal design with few measurement moments, modeling auto- and cross-correlations. In our special issue, Liang, Hanig, Evans, Brown, and Lian (2017) used this approach to examine how abusive supervision relates to employee physical health and show that this relationship is mediated by rumination. Advantages of this technique are that one can test whether the causal processes are stationary and in equilibrium, and whether reversed causal paths exist (Cole & Maxwell, 2003; Liang et al., 2017). However, it is important to note that with those designs, one still focuses on between-person effects. To investigate temporal precedence of within-person effects, one would need to collect repeated measures data and use multilevel modelling with time-lagged variables. An example of such an approach can be found in the paper by Vleugels, De Cooman, Verbruggen, and Solinger (2018), who examined the temporal precedence of within-person relationships between person-environment fit, affect, and performance. By comparing different temporal orderings in these relationships (normal causation, reversed causation, and reciprocal effects), they tested competing theoretical perspectives about person-environment fit dynamics.

Temporal variables. A second way to take time into account is through temporal variables or time-related constructs (Sonnentag, 2012). An example of such a construct is future time perspective, which is one's subjective perception of the future as being limited or open-ended (Lang & Carstensen, 2002). In this special issue, Rousseau, Hansen, and Tomprou (2018) draw attention to a velocity feedback mechanism when describing a theoretical phase model of psychological contract processes, arguing that the comparison of perceived versus expected speed of inducement delivery determines how employees affectively respond to psychological contract fulfillment. An important benefit of incorporating a temporal variable such as perceived speed of inducement delivery is that it captures subjective elements of dynamic processes, going beyond clock time.

Temporal context. Another common way to factor in time is by treating it as a contextual variable. This means that time could be treated as a moderator, creating boundary conditions for relationships or defining qualitatively different processes depending on time (e.g., career phases). Examples in this special issue include the articles by Rousseau et al. (2018) and Burtscher, Meyer, Jonas, Feese, and Tröster (2018). The former delineates four distinct phases in psychological contracts over time: creation, maintenance, renegotiation, and repair (Rousseau et al., 2018). Each phase is characterized by a unique set of predictions concerning the role of employee and employer obligations. Hence, time serves as a contextual backdrop against which psychological contract processes are described. The latter paper distinguishes between performance episodes, showing that trust buffers the effects of physical activity on strain and that this buffering effect subsides in later performance episodes (Burtscher et al., 2018).

Temporal patterns. A more complex way of incorporating time is by looking for temporal patterns. This can be done by investigating how a variable changes over time, treating

time as an independent or predictor variable. The resulting trajectory then forms a pattern that offers information on the evolution of dynamic phenomena over time (e.g., growth or accumulation, decline, bifurcation) (Griep & Vantilborgh, 2018; Roe, 2008). New phenomena can emerge from these patterns (Kozlowski et al., 2013): as lower-level entities interact over time, phenomena may start to dynamically manifest at higher levels. Several articles in this special issue focus on temporal patterns and emergence. First, Uitdewilligen, Rico, and Waller (2018) used pattern detection algorithms to identify action patterns (i.e., recurrent sequences of actions) when team members collaborate on an assignment. They then examined how these action patterns dynamically emerged over time and how they related to overall team effectiveness. Second, Lopez-Kidwell, Niven, and Labianca (2018) present a theoretical model of workplace relational dynamics that seeks to predict changes in relationships between two actors over time. They focus on patterns in such changes by differentiating various relationship trajectories that may emerge, such as improving, static, and declining trajectories. Third, Lehmann-Willenbrock and Chiu (2018) used statistical discourse analysis to gain a better understanding of content disagreements during team interactions. They coded more than 30,000 turns of talk by team members during meetings, empirically showing, for example, that behavior patterns such as describing a solution helped to solve disagreements. Fourth, Schechter, Pilny, Leung, Poole, and Contractor (2017) used relational event modelling to analyze sequences of interactions between team members. They showed that certain patterns of interactions, as captured by network characteristics such as reciprocity and centralization, can be linked to emergence of team-level perceptions of process quality.

Dynamic systems. Finally, dynamic systems may arguably form the most complex way to integrate time when examining dynamic phenomena, as this approach can capture many of the

previously mentioned roles of time simultaneously, including temporal precedence, context, and patterns. A dynamic system consists of one or more variables and describes how these variables change from one point in time to the next (Wang et al., 2016). It is often described in terms of attractors that pull the system towards equilibria in which it remains relatively stable (Westaby et al., 2014). Various techniques exist to model dynamic systems, including latent change models (Grimm, Zhang, Hamagami, & Mazzocco, 2013), differential equations (Sosnowska, Hofmans, & de Fruyt, 2017), and vector auto-regressive models (Bringmann, Lemmens, Huibers, Borsboom, & Tuerlinckx, 2015). These dynamic system models are able to capture highly nonlinear patterns over time, due to their ability to take into account, amongst others, feedback mechanisms and reciprocal effects. Two articles in this special issue rely on dynamic systems thinking. First, Vander Elst, Notelaers, and Skogstad (2017) used latent transition analysis to demonstrate the existence of reciprocal relationship between latent states of job insecurity and depression. Although they mainly focus on temporal precedence, their model could be seen as a dynamic system. Second, van de Brake, Walter, Rink, Essens, and Vegt (2018) used a latent change score model to explore the dynamic reciprocal association between membership of multiple teams and individual job performance over time.

Challenges and opportunities

In closing, we would like to look beyond the current issue and focus on three specific challenges for researchers who want to start studying dynamic phenomena at the workplace, hoping that these issues get more attention in the (near) future.

A first issue is that existing theories often fail to adequately account for the role of time (Sonnentag, 2012). Many theories address temporal precedence but overlook elements such as timing of effects, temporal patterns, feedback loops, and so forth. As a result, it can be

challenging for researchers to derive theoretical propositions. In such cases, exploratory empirical studies or computational modeling studies (Weinhardt & Vancouver, 2012) are needed to facilitate future empirical research on dynamic phenomena and to extend current theories. In addition, we would like to point out that many theories discuss within-person dynamic processes (e.g., mediation processes). Yet, these have mostly been tested using a between-person differential lens. It is important to realize that translating results from a between- to a within-person perspective can only be done when stringent assumptions are met, namely the within-person process needs to be stationary and the process should be homogeneous across subjects (Molenaar, 2004). Therefore, we believe that retesting theories with the appropriate design may be warranted in some cases.

Second, collecting data that allow studying how phenomena dynamically unfold over time can be challenging. In many cases, a large number of repeated observations is required, and this may lead to respondent fatigue and dropout, while at the same time decreasing the likelihood that participants opt-in to the study. Luckily, the increased availability of ambulatory assessment techniques, such as experience sampling and diary studies, facilitate the collection of high-density temporal data (Fisher & To, 2012; Hofmans, De Clerq, Kuppens, Verbeke, & Widiger, 2018; Ohly, Sonnentag, Niessen, & Zapf, 2010). In addition, many smartphones and -watches now contain sensors that can be used to capture information on movement, location, heartrate, and other indicators that could be used to infer psychological processes (e.g., activity or stress levels) (Burtscher et al., 2018). Alternatively, researchers can record interactions at the workplace (Lehmann-Willenbrock & Chiu, 2018). We therefore believe that, while challenging, rapid developments in measurement offer opportunities for researchers to collect high-density repeated measurements data on workplace dynamics.

Finally, analyzing dynamic phenomena can be challenging. One of the reasons for the increasing popularity of this line of research is the rapid improvements in analytical techniques and in computational power (Morin, Bujacz, & Gagné, 2018; Wang et al., 2016). The downside of this is that the sheer amount of available analytical techniques can be overwhelming. Learning to apply techniques such as functional data analysis (Hofmans, Vantilborgh, & Solinger, 2017), latent change models (Grimm et al., 2013), or vector autoregressive models (Bringmann et al., 2015) can be daunting and requires a substantial investment of time and effort. We therefore believe that collaboration between researchers with a substantive interest in testing theories and with strong methodological and analytical skills will become increasingly important.

Conclusion

Almost two decades ago, Ancona and Goodman (2001) wrote that several factors hampered research from adopting a temporal lens and focusing on dynamic phenomena: it is not convenient, it requires a long-term focus, and it can be a difficult and complex endeavor. We believe that recent advances in theory, methods and analyses, and in the mindset of researchers are helping to overcome these factors. As we highlight in our discussion on the diverse roles of time, there are myriad research questions left unexplored. Now is the time for researchers to adopt a temporal dynamic perspective on workplace phenomena. Doing so will unquestionably advance our field as we gain a more accurate understanding of *what* happens, *how* things happen, and *why* things happen at the workplace.

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	Intraindividual processes	Interindividual processes
Single variable	e.g., trajectory of job performance over time within individuals	e.g., pattern of conflicts between two coworkers
Multiple variables	e.g., covariation between trajectories of job performance and job satisfaction over time within individuals	e.g., covariation between pattern of conflicts and pattern of helping behavior between two coworkers

Figure 1. Categories of dynamic workplace phenomena.