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Special Issue Article

Methodologies for the study of organizational behavior processes: How to find your keys in the dark

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Summary The field of organizational behavior is very much concerned with process—the temporal sequence by which conditions, events, and states unfold. Such processes are implied in tests of mediation and more complex causal chains. The popular approach of analyzing data from cross-sectional designs with complex statistics is not particularly helpful in understanding process. The optimal way to investigate process involves the proper use of a combination of qualitative and quantitative, experimental and nonexperimental methods that allow us to assess variables in a temporal sequence with appropriate lags informed by how long it takes for one step to lead to the next. Two general approaches are possible: take observations before and after each step in a process to show how a variable changes from before to after an event, or continuously monitor a variable to see how it changes as events occur. A variety of nonexperimental approaches can be used including content analysis of archival materials, direct observation, panel designs, retrospective event histories, and sequence analysis. With the quantitative approach, daily diary and experience sampling approaches can be particularly useful in studying processes that occur within-person. Copyright © 2014 John Wiley & Sons, Ltd.

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Mr. X: What are you doing?
Mr. Y: Looking for my keys.
Mr. X: Did you lose them here?
Mr. Y: No, I lost them up the street, but the light is better here.

(Quote Investigator. Online http://quoteinvestigator.com/2013/04/11/better-light/#return-note-5967-9, Retrieved 17 July 2014.)

Although not always framed as such, the field of organizational behavior is very much concerned with the idea of process, that is, the sequence of events leading from some beginning condition or state to a final outcome. This can be seen in theories that suggest a series of steps, very often beginning with organizational and personal factors leading to internal states such as emotions or perceptions, and then to outcomes that could be behavior, the results of behavior (job performance), or some aspect of health/well-being. It can be seen in articles that test structural models that suggest an order from left to right of one variable leading to another. It can be seen in tests of mediator hypotheses that suggest a sequence of events from independent variable to dependent variable through one or more intervening mechanisms. It can even be seen in articles in which bi-variable relationships are studied as pieces of some larger process whereby the *X* variable is theoretically expected to lead to the *Y* variable, often referred to as antecedents and consequences. With all the concern about identifying process, it is remarkable how seldom efforts are made to explicitly assess processes as they unfold over time (Langley, Smallman, Tsoukas, & Van de Ven, 2013). Most often,

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variables are assessed cross-sectionally in an attempt to test hypotheses that are best addressed using more complex and ongoing assessments that can demonstrate the time sequence in which things occur. The rarity of studies designed to observe processes in real time is understandable, given the difficulty in conducting them (Ancona, Goodman, Lawrence, & Tushman, 2001), so our approaches to studying process are too often akin to the person in the old joke who searches for lost keys where there is light rather than in the dark where they were lost. In this paper, we will present some ideas about the nature of organizational behavior processes and then discuss available approaches that can be used to study them.

What Is Process

Process is simply a sequence of events that unfolds over time. Science can be said to focus on relationships among conditions, events, and states (Rosenberg, 2012), and processes describe the patterning and temporal ordering among them. In organizational behavior, we study environmental conditions that are considered chronic and relatively stable, such as the complexity of a job or the leadership style of a supervisor. Some individual factors, such as ability or personality, are also considered to be relatively fixed and trait-like, and might represent internal conditions. States, such as emotions or physiological responses, are aspects of the individual or situation that vary over time, sometimes moment to moment, and sometimes over hours or days. Of course, as temporal stability increases, states become more like chronic conditions or traits of the individual. Events are things that happen in episodic slices of time. An event could be something one experiences at work, such as being verbally attacked by a customer, or a behavior, such as helping a coworker with a difficult task. What distinguishes events is that they can be defined and recognized as a coherent whole and have a defined beginning and ending, although boundaries are not always clear-cut. Furthermore, events can involve multiple actors, and not everyone might experience the same aspects or the entire duration of an event.

A process describes a temporal sequence of conditions, events, and states. Sequences can involve continuous variables that change, or discrete events that occur at some point in time (Abbott, 1990). Such sequences can represent cyclical patterns that recur, or they can represent a nonrepeating series of steps (Monge, 1990). The approach to the study of process can take two general forms: the variance approach and the process approach (Langley et al., 2013). The *variance approach*, which is typical of most quantitative studies, investigates relationships among variables. It typically is used to address questions about the antecedents or consequences of change on one or more variables (Van de Ven & Huber, 1990). The way the variance approach is typically applied, temporal sequencing is either just assumed (cross-sectional designs) or represented as lags, often arbitrarily chosen (longitudinal designs). Significant relationships between pairs of variables assumed to be adjacent steps in a process are taken as support for that process. Such evidence certainly demonstrates that a process is feasible, but it does not establish temporal sequence, as there can be many reasons that a given pattern of relationships is found. Furthermore, regardless of the nature of the phenomenon, most of our studies assume a recursive process, assuming the temporal order runs in one direction (Cronin, Weingart, & Todorova, 2011; Taris & Kompier, 2014). Although it is sometimes noted that many phenomena are nonrecursive, with reciprocal flows and feedback loops, most research studies are concerned with only investigating one direction, if directionality is built into the study design at all.

The *process approach* is concerned with the explicit mapping of events and change over time. It is typically used to answer questions about how change emerges and develops (Van de Ven & Huber, 1990). This approach is more characteristic of qualitative studies, where in-depth analysis and observation of individual cases allows for a more precise mapping of the steps of a process over time. Some have suggested that process studies require a qualitative approach (e.g., Hinings, 1997), and indeed, the literature on methods for explicitly studying process is more qualitative than quantitative. However, much of the reason is that quantitative researchers have been slower to fully utilize available methodologies to study process.

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Causal processes

Many of the processes we represent in our models and theories assume at least implicitly that the processes are causal; that is, the links from step to step indicate that conditions, events, and states at each step are the causal agents of the next. Although processes can reflect causal connections, causality is not a necessary element for a series of steps to be a process. It is possible to delineate a process in which steps occur in a precise order, yet none of them are the actual cause of the next, as a variable can be an antecedent that is merely related to the actual cause. As Rosenberg (2012) explains, the sound of thunder reliably follows the flash of lightning, but it is not the light we see that is the cause, but rather both lighting and thunder are effects of an electric discharge. Thus, we can distinguish prediction in which one variable reliably occurs prior to another (lightning flash predicts thunder), from causation in which one variable is the mechanism by which another occurs.

A causal case is often described as meeting three criteria (Shadish, Cook, & Campbell, 2002). *X* can be concluded to cause *Y* if (i) they are related, (ii) *X* precedes *Y* in time, and (iii) there are no feasible alternative explanations for the *X*–*Y* relationship. An observed process in organizational behavior meets the first two conditions but not necessarily the third. There are likely many processes that we study that are not in fact causal chains. Nevertheless, they are potentially valuable if it can be shown that manipulation of *X* can lead to *Y*, even if we are not certain about the underlying causal mechanisms. In medicine, for example, a variable can be classified as a correlate (something that is associated with an outcome, such as a disease), a proxy risk factor (something that precedes and predicts later occurrence of an outcome), or a causal risk factor (something that precedes an outcome and affects it when changed or manipulated) (Kraemer, Stice, Kazdin, Offord, & Kupfer, 2001). The second and third types can be considered processes, although the second does not have a necessary causal connection. Still, proxy risk factors can be valuable in medicine because they help indicate the subsequent development of disease even if they are mere concomitants of the real cause. The same is true in organizational behavior; while we might wish to know the causal risk factor, it can be quite useful to know that something can presage an important outcome. For example, empirically keyed biographical information blanks can predict future job performance, although typically, it is not clear why (Cucina, Caputo, Thibodeaux, & Maclane, 2012).

Scientifically demonstrating a process is a straight-forward exercise in showing that conditions, events, and states occur in a reliable temporal sequence. Causation is an inference that can be difficult if not impossible to make without some degree of uncertainty as to its veracity. Demonstrating causation using the three rules of a causal case is quite challenging and ultimately is a goal that can never be reached, as one cannot know if there is some unexplored explanation that is the real cause. A causal risk factor approach is more attainable, as it merely demands a demonstration that manipulation of proposed causes reliably results in the expected effects, even though ultimately the true underlying mechanism might not be known. Note that the criterion for a causal risk factor is not necessarily that the researcher experimentally manipulated the proposed cause but merely that the proposed cause has changed. Thus, one can study naturally occurring change to build a causal risk factor case. For example, Beal and Ghandour (2011) were able to take advantage of an unplanned event, Hurricane Ike, to see the potential impact it had on workplace emotions.

Temporal issues

Processes are inextricably linked to time, as a process is a temporal sequence of conditions, events, and states. To understand processes, we must adopt what Ancona et al. (2001) referred to as the temporal lens; that is, time must be an explicit part of our studies and theories. Mitchell and James (2001) discussed two important temporal elements involved in processes. The equilibration period is the amount of time it takes for an antecedent to affect a consequent and reach a steady state. This is important in designing a research study because choosing a time lag that is too short will fail to fully capture the effects of the first variable on the second. The moderation by causal cycle (MCC) curve maps the form of the change in the consequent over time, at first rising (or falling), then reaching a plateau, and

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eventually decaying as it falls (rises) back to the initial state. The MCC curve is particularly relevant to processes that are cyclical Monge (1990).

Zaheer, Albert, and Zaheer (1999) described five types of time intervals that are important for our studies and theories. *Existence interval* (similar to the equilibration period) is the time for the process to unfold. *Validity interval* is the time over which the phenomenon occurs (e.g., only on working days). *Observation interval* is the elapsed time for each wave of observation (e.g., the length of each session during which observers watch employees). *Recording interval* is the lag between observation periods (e.g., length of time between assessments in a longitudinal survey study). *Aggregation interval* concerns how data are combined; for example, sales could be aggregated to the daily, weekly, or monthly level.

The Nature of Organizational Behavior Processes

Many of our theories are based on a work environment–outcome framework, noting how working conditions and events impinge on employees and lead to behavior and other outcomes, through a process that involves one or more internal states. We see this framework in popular theories, such as job characteristics (Hackman & Oldham, 1976), leadership (Graen & Uhl-Bien, 1995), and stress (Karasek, 1979; Perrewe & Zellars, 1999). Given that process implies a temporal sequence, there must be a beginning and end, and possibly intermediate steps. In order to study a process with a degree of certainty, we should start prior to the beginning of the process, so we can observe it unfolding. In other words, we need to determine the equilibration period, and with cyclical processes, the MCC curve, not only so we can understand the process but also so we can choose the appropriate recording intervals. To properly investigate the process, we must take measurements before and after each step in order to see if what happened at step i precedes what happens at step $i+1$. A process is best seen as a series of events and conditions that flow from one to another.

The study of process is very much concerned with patterns of change, both for single variables and for the relationships among variables (Monge, 1990). Although not all that common, it can be quite useful to study the change over time in single variables, particularly if the interest is in studying phenomena that change with time (e.g., stages of team development) or with exposure (e.g., development of stress-related illnesses). Not only can questions be asked about change over time but one can also determine if the trajectory of a variable is affected by another variable, perhaps with the use of latent growth modeling statistics (Chan, 1998). Likewise, one can study whether relationships among two or more variables remain constant over time, or if relationships change, for example, with increased tenure on a job.

Approaches to Studying Process

Two general approaches to studying process are to (i) take measurements before and after each process step, or (ii) take continuous observations as the process unfolds. A serious challenge to the first approach is to know the appropriate lags that will result in before and after assessment (Taris & Kompier, 2014). To best use this approach, it would be necessary to first determine the appropriate lag. The second approach requires less knowledge of the appropriate temporal spacing of observations. One must know when the process should begin and end so the observation interval can be chosen, and in cases where one cannot maintain continuous observation around the clock but will take samples of observations, one must choose the recording interval. Regardless of whether one is conducting experimental or nonexperimental research, both of these strategies can be applied.

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Qualitative and quantitative approaches

Both qualitative and quantitative methods can be utilized to study process. Qualitative approaches are particularly suited for the task because they allow for in-depth investigations over time (Hinings, 1997), often without an *a priori* restriction on the order or timing of conditions, events, or states. To investigate process, qualitative studies can utilize in-depth longitudinal approaches, often using a variety of methods, including content analysis of archival sources, interviews with key informants, and observations/ethnographies (see as an example Pettigrew, 1990). Such studies do not have to be limited to individual cases but can involve comparative case analysis where multiple organizations are contrasted to increase generalizability of results. The use of multiple methods allows for assessment before and after steps in a process (e.g., Glick, Huber, Miller, Doty, & Sutcliffe, 1990, conducted four waves of interviews 6 months apart), as well as continuously (e.g., Im, Yates, & Orlikowski, 2005, content analyzed 1 year's emails in order to track events over time). The strength of qualitative approaches is that they allow for the study of events as they unfold in time. Thus, the investigator does not have to know in advance what the important variables are that should be assessed or how often measurements need to be taken.

Quantitative studies can provide valuable information about the levels and distributions of variables, the probabilities that one event is linked to the next, and effect sizes of relationships between or among variables. They are able to introduce both design and statistical controls over biases and potentially confounding variables. However, the design of a quantitative study necessitates *a priori* information that might not be available concerning the specific variables to include and the temporal order and lags among those variables. A particularly useful strategy is to mix qualitative and quantitative approaches to more fully investigate a process. Exploratory qualitative approaches, for example, can be helpful as first stages of quantitative investigations in that they can provide insights into the nature of a process including the relevant conditions, events, and states. However, the qualitative approach does not have to be used solely as a first step but can be used to test theory-driven hypotheses in parallel with quantitative approaches that when combined will provide confirmation using different methodologies.

Experimental methods

The main objective of the experimental method is to demonstrate links in a process chain, showing that a hypothesized antecedent can lead to a proposed consequence. The typical experiment deals with two link chains and can be very helpful in showing individual connections, although this sheds little light on a longer sequence of events. One might show that A can lead to B and that B can lead to C, but that does not mean that when A leads to B, C will follow. Sometimes, longer chains of a process are tested experimentally, most notably the three link chain of mediation. In some experiments, the independent variable is assessed, followed by the mediator and dependent variable. Although these experimental designs can be helpful, as Bullock, Green, and Ha (2010) pointed out, it is not always clear that the assumed mediator is the underlying mechanism rather than something associated with that mechanism. They note as an example that the manipulation of self-efficacy via verbal messages might also affect mood, which could be the real mediator.

Two experimental approaches to dealing with the mediator are possible, one in which it is manipulated and the other in which it is merely observed. Stone-Romero and Rosopa (2008) presented a strategy that involves conducting two linked experiments. In the first, the independent variable is manipulated to see its effect on the mediator. In the second experiment, the mediator is manipulated to see its effect on the dependent variable. The second approach is to incorporate continuous observation into an experimental design by manipulating the independent variable and then observing both the mediator and dependent variable over time. This would allow the determination of the temporal order as well as lag. This is most feasible if the mediator and dependent variable are easily observable, such as behavior, facial expressions, or physiological responses. With behavior and with vocalizations, observers can be present to code in real time, or experimental sessions can be recorded for subsequent coding. This approach has been used in research on groups/teams (see review by Arrow, Poole, Henry, Wheelan,

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& Moreland, 2004). This sort of design is not limited to a quantitative approach. Verbalizations and other data can be content analyzed and dealt with qualitatively, which offers the possibility of in-depth analysis of events as they unfold during the experiment.

In some cases, it would be possible to run an experiment that consists of a number of discrete trials with each consisting of manipulation of the independent variable and assessment of the dependent variable. This could be carried out, for example, in a study of fatigue, with a trial consisting of the completion of a task followed by assessment of fatigue and other variables of interest. Assuming some variables were affected before others, it would be possible to trace the temporal order and lag over the experimental session. A similar approach could be carried out in the field if job performance occurs in a sequence of discrete trials or tasks, such as waiting on individual customers for customer service employees.

Nonexperimental methods

Nonexperimental methods involve observation without manipulation. We will discuss four approaches noted by Glick et al. (1990): archival designs, direct observation, panel designs, and retrospective event histories, to which we will add daily diary studies and sequence analysis.

Archival designs

Archival records and data sources that are longitudinal can be used to address process. Such studies can be qualitative (e.g., Wright & Zammuto, 2013) or quantitative (e.g., Klarner & Raisch, 2013), depending on the nature of the archival data (text/verbalizations vs. numerical observations). Text can be content analyzed to determine the temporal order of events. For example, Wright and Zammuto (2013) content analyzed 949 documents from a 68-year span that were acquired from an organization's private library. These included meeting minutes, agendas, reports, and memoranda. An advantage of archival sources is that these data are free of the researcher's bias, and if different variables can be gathered from independent sources, concerns about common method variance would be minimized. A limitation is that archival data do not exist for all research questions, and because they were not designed to address the researcher's questions, often the measures do not precisely assess the variables of interest or are in some way deficient.

Direct observation

Direct observation over time can involve a number of techniques that allow for continuous assessment. This can include instruments to assess physical properties (e.g., heart rate), observers who are embedded in the work environment, or audio/video recording devices. An advantage of direct observation is that the process of interest can be assessed in real time. As with archival designs, both qualitative and quantitative approaches are possible depending on the nature of the data. Observers can be members of the organization who are asked to record data, or they can be researchers who are allowed access to the organization. Observers can record the phenomenon of interest as it occurs (e.g., record each time a particular behavior is exhibited), or they can make ratings at the end of the observation period. The use of observers is limited by some practical issues. First, direct observation is time consuming, and access to employees in the workplace can be difficult. Second, at least with ratings, it is not clear that observers are necessarily accurate (Frese & Zapf, 1988).

Not all variables of interest lend themselves to continuous monitoring, but many do. For example, it is possible to electronically monitor physiological reactions, such as blood pressure, with devices that take the measurements and record the results. Devices are available that can record activity levels and sleep quality. Behavior can be recorded with video equipment (Campos, Graesch, Repetti, Bradbury, & Ochs, 2009) or *in vivo* observations (Held & Manser, 2005), and verbalizations can be recorded with audio devices (Holleran, Whitehead, Schmader, & Mehl, 2011). Such approaches have been underutilized in organizational behavior research but could serve as supplements to diary studies. Of course, continuous monitoring can produce large volumes of data that will require considerable resources to analyze, but such data sets can provide important insights into organizational behavior processes.

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Panel designs

By far, the most popular quantitative approach to the study of process is the panel design in which employees are surveyed at two or more time periods. Such studies have been described as a series of cross-sectional snapshots (Glick et al., 1990), which makes it difficult to directly capture the steps of the process of interest. To draw conclusions about process requires at least one more observation point as the number of events or steps in a chain and assumes that the proper time sequence was chosen so that measurements could be taken before and after each step has occurred. In the simplest case, one would assess the level of a dependent variable before and after some event, or the person became exposed to a condition. To accomplish this, one must know the critical links in the process and the appropriate temporal lags. Of course, it is possible to take extra assessments so that there might be two or more measurements between steps in the process. The best scenario is one in which there are lagged effects and the possibility of frequent assessments so that the change in one variable following another can be temporally pinpointed. To do this can require frequent repeated assessments.

Although determining the appropriate assessment intervals can be difficult, there are two strategies that can be helpful. First, one can study discrete changes or events, with assessments taken before and after the change. This might involve cases where an individual changes jobs, gets promoted, has his or her first child, gets a new supervisor, or is injured on the job. Some of these incidents do not occur very frequently, so either one needs a large sample to find enough cases who changed, or one needs a long time frame for the study. Second, for many questions, it can be helpful to study individuals before and after entering the workforce. For example, Spector and O'Connell (1994) took baseline measures of graduating college seniors in school and followed them up at work about a year after graduation (for a similar design with a longer time frame, see Kälin, Keller, Tschan, Elfering, & Semmer, 2014). With this design, one can see if exposure to an environmental condition or event has an effect on a dependent variable of interest. A limitation to this approach is that many variables that might be of interest would not exist prior to entering the workforce (e.g., job performance or job satisfaction). Nevertheless, when possible, both of these approaches can provide evidence for temporal order.

Retrospective event history

This method utilizes key informants to report the sequence and time frame of events that occurred in the past (Glick et al., 1990). It can be used in an open-ended manner, allowing informants to generate their own events, or it can be used with a predetermined list of events that informants check as having occurred. Glick et al. (1990) described a longitudinal study in which key informants were interviewed on four occasions at 6-month intervals. Each time they reported on the prior 6 months, and for the latter three interviews, they reported on consequences of events that had occurred during the prior time period. They noted two particular weakness of this method. First, that there were communication gaps between the key informants and researchers in that sometimes terminology was imprecise and inconsistent. Second, there were likely errors of recall when reporting the order and timing of events. Nevertheless, the use of event histories has some advantage over panel designs in that the key informants can directly report about a process and the timing of events rather than having to assume that what was assessed at a later wave in a study must have occurred after what was assessed at an earlier wave.

Daily diary studies

Daily diary or experience sampling studies allow for periodic assessments of individuals over fairly short periods of time. Generally, assessments are taken over consecutive work days, often with multiple assessments per day (e.g., before work, at meal break, after work, and before bedtime). The typical use of this approach is to show that within person, days that are characterized by a particular type of event will result in a higher level of a state than will days in which such events did not occur. In general, diary studies focus on changes within an individual. This stands in contrast to the cross-sectional survey and most panel designs that examine between-person differences of chronic conditions. Importantly, various scholars have noted that most psychological processes reflect within-person variability of states (such as affect, behavior, and cognition) and not traits (for a detailed discussion, see Hamaker, 2012); hence, diary studies that focus on changes within an individual

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are particularly well suited to test such processes. The repeated assessments of a daily diary study could allow for the investigation of process, as assessments of variables for all steps could be repeated to show that after an event occurs, a sequence of events or states follows. This requires that the time sequence is chosen so that assessments can be taken before and after each step of the process to show change (Taris & Kompier, 2014).

An issue with the daily diary study is nailing down the precise time at which events and states occurred relative to one another. Often, an outcome variable, say mood, would be taken before work and at the end of the day. A measure of whether the event of interest occurred that day would also be taken at the end of the day, as well. Because there are two mood measures, one could see if mood changed on days of the event. From this design, one could reasonably conclude that the event was associated with the outcome, but if both the report of the event and mood were collected at the same time, it would not be certain which occurred first, that is, if the change in mood occurred prior to or following the event. Let us say the event was an argument with the supervisor. It is conceivable that something other than the argument led to the mood change, and it was the mood change that led to the argument. Therefore, it has been suggested to separate measures of the predictor and the outcome (Ohly, Sonnentag, Niessen, & Zapf, 2010), but even in cases where they have been assessed at different time points [e.g., predictors in the afternoon and outcome at the end of work (e.g., Meier, Semmer, & Gross, 2014, Study 2)], it cannot be ruled out that the outcome actually changed before the event happened. To know which came first, one would have to ascertain the time at which the argument occurred, and the time at which the mood changed. This could be carried out using methods that allowed more continual monitoring or using an event sampling approach. With event sampling, participants could be asked to complete a diary when a certain event occurred, and the diary would also include the outcome. A combination of event sampling with daily diary at the beginning and end of the work day could be helpful if it can pinpoint when events and changes occurred. Assuming there is a lag between the event and the outcome, one could show that the outcome (e.g., mood change) did not occur immediately after the event when the event sample was taken, but mood change occurred later, for example, the end of the work day. To use this approach, of course, one needs to study states that do not occur too rapidly. If the outcome occurs immediately, it would be difficult to disentangle which occurred first unless the outcome is something that can be continuously monitored.

Daily diary studies, and other survey techniques, can be intrusive, requiring the participant to stop what he or she is doing to complete an assessment. This can interfere with work tasks, and when significant events occur, often there is no time for the participant to stop work to do an assessment, for example, if one wishes to study stress under crisis conditions in an emergency room setting. There also can be measurement bias and reactivity when frequent assessments are taken, as participants will recall their responses from assessment period to assessment period, and might try to remain consistent in a way that distorts results (Gunthert & Wenze, 2012). Thus, there are severe limits on how often one can reasonably expect participants to complete assessments and provide accurate reports.

Sequence analysis

Sequence analysis is a technique used to track the order of events over time (Abbott, 1990). This method is particularly useful when the events in question are discrete (occurred or not), and one can track the incidence of events over time, as well as the lags between events. The data for events can be placed into a bit map, which is a matrix in which rows represented ordered time periods (e.g., days) and columns represented specific events (Van de Ven & Poole, 1990). Each element in the matrix is coded 1 if the column event occurred during the row time period.

There are several different statistical methods for analyzing sequence data (for a summary, see Abbott, 1990). Results might show one or more recurring patterns, suggesting that with a given phenomenon, not all cases arrive at the same end state through the same steps and not every case arrives at the same final state. For example, Abbott presented as an example the career progression for 18th century musicians, finding six distinct patterns. It is also possible to see if additional variables might predict specific sequences. For example, there could be individual or situational differences that predict sequences of events over time for individuals or organizations.

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Conclusions

Although the field of organizational behavior is implicitly concerned with process, and process is inextricably linked to time, the element of time in our methods and theories has been largely ignored (Sonnentag, 2012). Whereas the testing of process theories and hypotheses, such as mediation involving variable triplets and more complex models involving four or more steps, is common, explicit discussion of the temporal unfolding process is not. Too often, time is not even part of an investigation, as patterns of relationships from cross-sectional studies are taken as support for process hypotheses. Furthermore, it is typically assumed that processes are unidirectional, with little attention given to alternative causal orders, such as reciprocal relationships of work conditions with well-being (Ford et al., 2014) and behavior (Meier & Spector, 2013).

It is time for organizational behavior researchers to pay more attention to temporal issues in the design of research studies and theories that address process. Our theories should not just state that one thing leads to another, but they should note the time sequencing that we should expect (Mitchell & James, 2001). Our methods should go beyond cross-sectional designs, and the use of arbitrary points in time for longitudinal studies, but base our choice of time frame on knowledge and theory about how long it takes for phenomena to occur (Mitchell & James, 2001; Taris & Kompier, 2014). Of course, this assumes that we have nailed down the temporal order of variables and have included the right variables in our studies. A combination of qualitative and quantitative methods can be helpful in answering these sorts of questions. Many of those studies will adopt an inductive approach, the goal of which is to merely track the order and lag of conditions, events, and states. These would not test an *a priori* theory and might not plow new theoretical ground at all. However, journal editors and reviewers should recognize the valuable contribution of studies that merely describe the order and timing of conditions, events, and states, as such knowledge can provide essential building blocks for new and better theories.

Ultimately, a deeper understanding of organizational process, both temporal order and temporal lag, would go a long way to advance our science. It would inform our theories and our practice. Methodological and statistical tools are available to help us attain this goal, although they can be costly to use in terms of effort and money. Despite the difficulties, if we are serious about understanding process, it is time to stop searching for our keys in the light, and start looking in the dark where we can find the answers.

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