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Field Experiments and Routine Dynamics

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Chapter 12 – Field Experiments and Routine Dynamics

Abstract

Experimental approaches are gaining in popularity across disciplines, ranging from behavioral sciences to economics. In this chapter, we discuss the advantages and disadvantages of field experiments and review their use by scholars to study routine dynamics. Based on these, we suggest that field experiments hold further promise to study routines given their potential to develop and test theory, while achieving internal and external validity. To further the adoption of field experiments to study routines, we outline a five-step procedure, including research questions and hypotheses, context and research setting, treatment and design, measurement and statistical tests, and managing field experiments. We conclude by discussing potential research questions and contexts suitable for field experiments.

Keywords: Routines, routine dynamics, field experiments, endogeneity, experimental design, internal validity, external validity, treatment group, control group

1 Introduction

Experiments are regarded as powerful techniques for establishing causal relationships and are considered a “gold standard” for scientific research. Experiments have been widely used in social sciences due to their ability to verify causal relationships and to assure high internal validity (Colquitt, 2008; Lonati, Quiroga, Zehnder, & Antonakis, 2018). Further, experiments have gained increasing popularity and wide acclaim as they can generate actionable insights for

practice and policy. For example, the Nobel Memorial Prize in Economic Sciences was awarded twice in recent years to economists that have pioneered experiments: to Richard Thaler in 2017 for his contributions to behavioral economics based on experiments and to Abhijit Banerjee, Esther Duflo, and Michael Kremer in 2019, for their experimental approaches to development economics. This stream of research is built upon the work of Daniel Kahneman and Amos Tversky, which challenged well-established rationality assumptions then prevailing in economic theory (Kahneman and Smith, 2002).

Experimental approaches can range from field experiments to laboratory experiments, and from natural experiments to quasi-experiments. Within business and management, experimental research has been increasing in recent years (Podsakoff & Podsakoff, 2019). However, some experimental designs, especially laboratory experiments, have been criticized for artificial manipulation of the research setting and their lack of generalizability, which severely limits practical implications that can be derived from experiments. To address this issue, experimenters started to run experiments in the *field* and rely on natural settings to test their hypotheses (Shadish & Cook, 2009). Unlike researchers using a laboratory experiment design, researchers in field experiments do not have full control over their research settings. As a consequence, the research settings are operated in a *natural* way such that the research findings are valid and practically relevant. Thus, field experiments can leverage the high internal validity of experimental design through manipulation and randomization and achieve high external validity of field research through grounding the tests in a real world setting.

While field experiments can potentially combine the advantages of internal and external validity, they are not easy to adopt to study organizational problems because of issues with access to organizations and control over participants and their roles. Further, field experiments

can be time and resource-intensive, which many researchers might not be able to afford. Despite these challenges, field experiments have been used to examine research topics related to routine dynamics, such as the emergence of routines (Bapuji, Hora, & Saeed, 2012), employee communication patterns after mergers (Schweiger & Denisi, 1991), knowledge sharing (Di Stefano, King, & Verona, 2014), process transparency between customers and service providers (Buell, Kim, & Tsay, 2017), and understanding-based routine re-design (Bapuji, Hora, Saeed, & Turner, 2019). These studies reveal that field experiments, if designed well and executed properly, can shed new light on the study of routine dynamics. Accordingly, to help routines scholars familiarize themselves with field experiments and use them in their studies, in this chapter, we will introduce field experiments and discuss their advantages and disadvantages. Further, we provide guidance on using field experiments to examine research questions related to routine dynamics.

2 Field experiments: Advantages and disadvantages

2.1 Field Studies, Experiments, and Field Experiments

Empirical methods broadly include field studies and experimental studies, both of which have advantages and disadvantages regarding internal and external validities. Empirical studies that are grounded in real organizational contexts and use interactions with practitioners (i.e., field studies) offer external validity but may lack internal validity because of lack of effective control groups. Examples of such field-based studies are case study, action research, survey, and archival data analysis. For example, action research is typically based on qualitative field data, and involves active and direct participation of researchers to help address organizational challenges. Action research studies often use an intervention and thus can generate insights relevant to practice. However, compared to field experiments, action research lacks rigor in

execution due to the absence of a control group, which makes the findings vulnerable to alternative explanations.

Recent concerns on endogeneity issues have shown that quantitative field studies are prone to endogeneity issues caused by measurement error, selection bias, omitted variable bias, and simultaneous and dynamic relationship between dependent and independent variables (Ketokivi & McIntosh, 2017). In contrast, laboratory research studies that use randomized subject assignment and controlled research settings generally exhibit strong internal validity but lack external validity given that behavior in the laboratory might not be representative of that in the real-world, and that experiment participants might not be representative of the population of interest (Podsakoff & Podsakoff, 2019). Therefore, field experiments were created to minimize the issues of validity and to leverage the advantages of both field studies and experimental design.

Field experiments help establish causality within real organizational contexts and are defined as “Studies that induce a change in a randomly selected subset of individuals (or teams, or units) within their natural organizational context, and compare outcomes to a randomly selected group for which the change was not introduced” (Hauser, 2017: p.186). In field experiments, interventions are deliberately introduced to observe their effects. Experimenters establish a causal relationship between an independent variable x and a dependent variable y by manipulating x , and then observing the change in the dependent variable y at different levels of x . In experiments, researchers randomly assign participants to experimental conditions. To gauge the importance of the treatment effect, this random assignment of participants is one form to test the experimental conditions. The assignment is generally into two groups, a treatment group and a control group. The treatment group receives an intervention, e.g., changed lighting, redesigned

job, or changed instructions, while the control group operates as usual. The effects of the intervention are then measured by the difference in the outcome between treatment and control groups. Causality can also be established if there is a significant difference between the treatment group and control group regarding the outcome variable, provided: 1) the assignment of participants to the treatment group and control group is random such that each participant has an equal likelihood of being assigned to the treatment group or the control group; 2) the manipulation is clean such that the treatment group and the control group differ only on the manipulated dimensions and not on any other.

We present the advantages and disadvantages of field and experimental methods in Table 1 below and discuss in the following paragraphs.

Table 1. Advantages and Disadvantages of Field and Experimental Methods

Research Method	Advantages	Disadvantages
Field-based Methods	<ul style="list-style-type: none"> • High external validity • Practically relevant 	<ul style="list-style-type: none"> • Low internal validity
Lab Experiments	<ul style="list-style-type: none"> • High internal validity 	<ul style="list-style-type: none"> • Low external validity
Field Experiments	<ul style="list-style-type: none"> • Balance between internal and external validity • Practically relevant 	<ul style="list-style-type: none"> • Difficult to implement

2.2 Advantages of field experiments

2.2.1 Accounting for (some) sources of endogeneity

While building models to posit and verify causal relationships is desirable in academic research, establishing such relationships requires accounting for several methodological concerns. To identify causally interpretable results, at least three conditions need to be accounted for. First, the independent variable and dependent variable should be correlated. Second, the

occurrence of changes in the independent variable should precede the dependent variable. Third, alternative explanations should be ruled out such that changes in the dependent variable can be explained only by changes in the independent variable. In research methods such as survey and archival data analysis, researchers have been developing techniques to address endogeneity issues, but the most convincing solution for endogeneity remains randomized experiments (Lu, Ding, Peng, & Chuang, 2018).

In contrast to other research methods, such as survey studies and research based on secondary data, a field experiment design enables a *ceteris paribus* situation that helps researchers to isolate the effects of other variables. As participants are randomly assigned to treatment and control groups in a field experiment, the possibility of preexisting conditions of the participants causing the change in the outcome variable is minimized. At the same time, clean manipulation ensures that the only difference between the treatment group and the control group is the level of intervention. Therefore, researchers can confirm that the change in the outcome variable has only been caused by the intervention.

2.2.2 Control over measurement

Experiments enable researchers to eliminate alternative explanations, and thus increase the internal validity of the research. In contrast, in regression-based field research, the credibility of a causal test depends on the availability of control variables and the accuracy of measurements. However, many variables are not directly observable in routines research, and thus researchers have to rely on indirect measures to represent them. For example, performance is the dependent variable in many routine studies. However, performance itself is latent and thus researchers have to rely on indirect indicators to measure performance. In addition, performance is affected by multiple factors, many of which may not be observable and might vary

simultaneously with independent variables. Relying on indirect measures might induce measurement errors and selection biases that raise doubts on the credibility of the results. To account for endogeneity, some studies use instrumental variables in their analyses. However, the choice and quality of instrumental variables depend on the availability of data, and low-quality instrumental variables may create more bias than fixing the endogeneity issues (Semadeni, Withers, & Certo, 2014). Conversely, in field experiments, researchers can deliberately create an exogenous variable that captures the change in organizational practices. This allows researchers to design question-driven research instead of being constrained by existing observable variables. In addition, researchers can allow one factor to vary at a time and thus disentangle the forces that drive change in performance to eliminate alternative explanations (Chatterji, Findley, Jensen, Meier, & Nielson, 2016).

2.2.3 Practically relevant

In contrast to lab experiments, field experiments produce results that are more practically relevant. In laboratory experiments, the research settings are completely controlled by researchers, which also introduces artificiality and thus results may not be applicable to management practices. In contrast, in field experiments, participants are less aware of the research as field experiments are generally implemented by managers or employees within the organization; thus, subjects are less likely to change their behavior due to observation by researchers. In addition, field experiments can capture factors that cannot be captured in lab experiments, such as the multifarious interactions between employees and managers, and changes in them. These factors make the results more applicable to practice. Further, field experiments examine the outcomes of actual responses rather than intended or imagined responses that might be captured by surveys and interviews. For example, to examine the effect

of a redesigned bin on recycling behavior of individuals, researchers can use a survey method that can capture either intentions to recycle (for a given redesigned bin presented to them in the survey) or recycling behavior (after giving them a redesigned bin prior to the survey). Both these approaches are less accurate compared to observing their actual behavior and comparing it to the behavior of those who did not receive a redesigned bin (i.e., those who retained the old recycling bin). This is because intentions to recycle might not translate into actual action and reported recycling behavior might be influenced by social desirability biases. Therefore, results based on field experiments can be more confidently used to provide actionable suggestions to change practices.

2.3 Disadvantages of field experiments

2.3.1 Internal validity concerns

Internal validity refers to the confidence that a researcher can have about the extent to which a change in the independent variable caused the change in the dependent variable (Podsakoff & Podsakoff, 2019). In experimental studies, internal validity issues arise when the treatment group and the control group differ on more than the intervened dimension. Further, internal validity of field experiments can be compromised by demand effects, unaccounted factors, and lack of incentives.

Demand effect refers to “change in behavior by experimental subjects due to cues about what constitutes appropriate behavior” (Zizzo, 2010, p.75). These effects may arise when participants change their behaviors due to cues related to what constitutes proper behaviors and what behaviors are expected by experimenters (Zizzo, 2010). As the intervention differs between treatment and control groups, the cues for expected behaviors are also different. Therefore, the groups may differ not only on the intervention but also on the behavioral expectations that were

cued to them; these demand effects might contribute differently to the outcomes in the two groups.

Controls are less precise in field experiments relative to laboratory experiments, as researchers in field experiments do not have control over the research setting, such as physical, psychological, and social characteristics of the participants. These unaccounted factors might interact with the intervention to affect the outcome variable. As a result, the reported effects might not solely be caused by the treatment variable but by a combination of both the intervention and background factors (i.e., participant characteristics, physical setting and any unknown factors in the setting). Consequently, results based on field experiments may be prone to alternative explanations. For example, Gossling, Arana, and Aguiar-Quintana (2019) found that other than the intervention, towel exchange behaviors in hotels are also affected by guest characteristics, such as nationality, age, length of stay, and location of the hotel. In field experiments, it is difficult to have participants of similar profiles in both control and treatment groups. Thus, it is possible that participants in the treatment and control groups might differ in some unknown characteristics that might affect the outcome variable.

Finally, participants might not take the experiment seriously if there is no link between participant actions and consequences to them (Lonati et al., 2018). In other words, participant incentives – both extrinsic and intrinsic – might affect the effectiveness of an intervention. In routines research, a change in a routine might affect participant incentives, which might introduce covariates that might interact with the intervention. Therefore, researchers should pay attention to factors that might affect participant incentives in field experiments.

2.3.2 External validity concerns

External validity refers to the extent to which research findings in one research setting can be generalized across populations or contexts. Although external validity concerns are fewer for field experiments conducted in organizational settings, they are not completely absent because of the selection of research setting and participant interactions among themselves.

First, organizations that agreed to participate in a field experiment might be different in some dimensions from other organizations that did not participate. This issue is more salient when the selection of organizations is not random. Due to the difficulty in getting access to the research settings, many researchers rely on convenience (rather than random) criteria to select research setting. This might introduce extra variables that might affect the outcome variable, e.g., top management interest or other such signals that the research question is important to the organization. Second, within the research setting, social interactions among participants might interact with the interventions. This effect is particularly stronger for routines research as routines emerge as a consequence of interactions between actors (Bapuji et al., 2012).

2.3.3 Implementation challenges

The implementation challenges in field experiments include difficulties in gaining access to and control over the organizational settings. Gaining access to appropriate research settings is difficult because organizations might be reluctant to participate in field experiments. This is understandable because the interventions might disrupt the daily operation of the organization and hinder the achievement of their performance goals. At the minimum, field experiments cause inconvenience to organizational members who participate in the treatment group and have to perform their roles in ways that are different than they have been accustomed to doing. Not surprisingly, field experiments occupy only a small portion of research articles in major

management journals (Eden, 2017; Podsakoff & Podsakoff, 2019). Moreover, even when researchers gain access to a site, they cannot gain full control over it. Therefore, it is difficult to implement full factorial designs in field experiments that manipulate firms in multiple ways, just as researchers can do in laboratory experiments. Consequently, field experiments become more suitable for examining more simple and direct research questions rather than complex ones.

3 Field experiments to study routine dynamics

3.1 Field experiments in routines research

To understand how past research has used field experiments to study organizational routines, we conducted a topic search in the *Web of Science* for “field experiments” in business and management categories. This resulted in several research studies that have referred to their studies as field experiments, but they did not follow the protocols of field experiments. For example, a study examining the effect of a new store display on consumer behavior was presented as a field experiment, but it did not involve a control group. As such, it was difficult to identify true field experiments, particularly those that were conducted to study organizational routines. Therefore, we expanded our coverage to include studies that involved an intervention related to what can be considered a routine (e.g., changed instructions to perform a task) and included a treatment and control group. In other words, we focused on any field experiments that involved what one can identify as an organizational routine, irrespective of whether routines theory was used in the study.

As presented in Table 2, scholars have used field experiments to study organizational routines of various types, ranging from dining routines to towel changing routines. Also, field experiments were used to study job and office redesign and their consequences to employees. More broadly, field experiments have been predominantly conducted in service settings, such as

hotels and restaurants. This is understandable because service sector organizations rely on routines to efficiently and effectively deliver services. It is also possible that these organizations were more willing to give access to their sites because any performance benefits due to interventions would be immediately visible to them.

Researchers have used field experiments for both theory development and theory testing in routines research. For example, Bapuji et al. (2012) used field experiments to examine how routines emerge within an organization. Specifically, by manipulating the towel exchange routine in a hotel, they found that routines emerge when interactions between routine participants are facilitated by intermediaries. Goldstein et al. (2008) examined effective communication strategies to consumers through field experiments in hotels. Their study shows that normative appeals (appeals employing descriptive norms), particularly those that describe how most people behave in a proximate setting, are more effective in evoking consumers' identities as environmentally concerned individuals, thus leading to the increase of towel reuse in hotels.

As field experiments have strong internal validity, they can also be used to test the causal relationships predicted by theories. For example, Buell et al. (2017) examined how visual transparency between service providers and consumers influences job satisfaction of service providers and quality perceptions of customers. Specifically, through two field experiments in food halls in two universities, they found that when customers observed the preparation of food by chefs and the chefs observed the customers, customer satisfaction with food was higher and so was the chefs' job satisfaction. In another study, Gössling et al. (2019) found that comprehensive messages that contain normative description of common identities and moral rewards were more effective in evoking resource conservation awareness in customers, leading to the increase of towel and linen reuse in hotels.

In short, even if field experiments have been few in number, they have made valuable contributions to routines research. Given that field experiments afford both internal and external validity and that they can be used to both develop theory and to test it, field experiments hold promise to further study routine dynamics. Accordingly, to help routines scholars use field experiments in their research, we present some guidelines in the following section.

Table 2. Field experiments on organizational routines

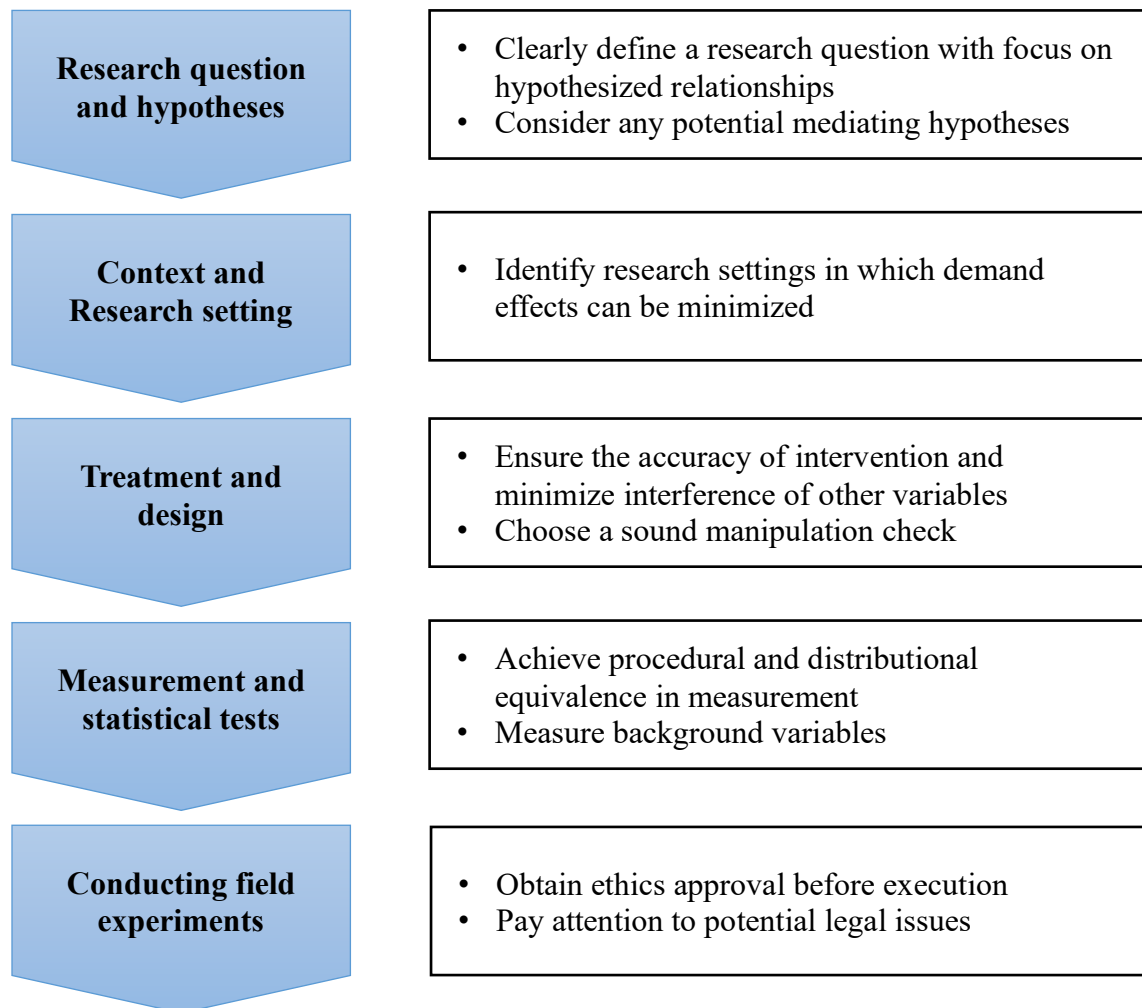
Authors (year)	Research Question	Research Setting and Intervention	Findings
Workman and Bommer (2004)	Effect of job redesign on job satisfaction, organizational commitment, and performance	<i>Setting:</i> A computer technology call center <i>Intervention:</i> Different types of work processes	High-involvement work processes increase job satisfaction, organizational commitment, and job performance. Such increase is stronger in teams that have high preference for group work.
Goldstein, Cialdini, and Griskevicius (2008)	Effect of message and social identity on towel reuse in hotels	<i>Setting:</i> Mid-sized, mid-priced hotel (190 rooms). <i>Intervention:</i> Different types of instructions.	Normative appeals (appeals employing descriptive norms) are more effective to evoke consumers' identities as environmentally concerned individuals, leading to increased reuse of towel in hotels.
McElroy and Morrow (2010)	Effect of office redesign on employee perceptions of culture and work-related attitudes	<i>Setting:</i> Financial services organization <i>Intervention:</i> treatment group assigned to smaller redesigned offices	Employees assigned to redesigned office have more favorable perceptions of culture and work-related attitudes.
Holman, Axtell, Sprigg, Totterdell, and Wall (2010)	Effect of job characteristics on job redesign	<i>Setting:</i> Large UK healthcare company. <i>Intervention:</i> Job redesign with variations in job characteristics, such as job control, participation, skill utilization, and feedback	The effect of job redesign intervention on employee wellbeing is mediated by the changes in job characteristics, such as job control, participation, skill utilization, and feedback.
Bapuji et al. (2012)	Intermediaries and routine emergence	<i>Setting:</i> Small, independently-operated hotel <i>Intervention:</i> Different procedures for towel changing	Routines emerge when interactions between routine participants are facilitated by intermediaries.
Buell et al. (2017)	Effect of visual transparency of service on customer perception and employee satisfaction.	<i>Setting:</i> A university food court <i>Intervention:</i> Treatment group with visual transparency of food preparation.	Visual transparency in service procedure increases both customer perceived service quality and service providers' job satisfaction.
Gössling, Araña, and Aguiar-Quintana (2019)	Effect of message on towel reuse in hotels	<i>Setting:</i> Seven hotels in a large hotel chain <i>Intervention:</i> Different types of instructions for towel reuse.	Comprehensive messages that contain normative description of common identities and moral rewards are more effective to increase towel and linen reuse in hotels. This effect is contingent on guest demographics, such as nationality, age, length of stay, and repeated visits.

Authors (year)	Research Question	Research Setting and Intervention	Findings
Bapuji et al. (2019)	Effect of routine redesign on routine effectiveness	<i>Setting:</i> Small, independently-operated hotel <i>Intervention:</i> Different procedures for towel changing	Understanding-based redesign that aligns with participants' understanding regarding how to perform their roles in a routine can improve the effectiveness of that routine.

3.2 Using field experiments

We present a few guidelines to design and conduct field experiments in Figure 1 below and elaborate on them in the following paragraphs.

Figure 1: Designing and conducting field experiments



3.1.1 Research question and hypotheses

The first step in designing a field experiment is to clearly identify a research question and formulate hypotheses about relationships among the study variables. Field experiments can be used for different types of research questions. For example, Chatterji et al. (2016) categorized field experiments into two types: *strategy field experiments* that uncover a directional

relationship between two variables; *process field experiments* that examine the mechanisms and mediators that link the independent and dependent variables. Similarly, Hauser, Linos, and Rogers (2017) categorized field experiments into audit field experiments, procedural field experiments, and innovation experiments. *Audit field experiments* aim to test the performance implications of existing processes, while *procedural field* experiments deal with how a changed process would affect outcomes, and *innovation field experiments* explore new processes to solve an organizational problem. Contextualizing these to routines research, we suggest that field experiments can be used by routine researchers to examine: the emergence of and changes in routines; theoretical mechanisms driving the emergence of and changes in routines; performance consequences of changes in a routine; theoretical mechanisms driving the performance consequences of changes in a routine.

Although field experiments attempt to address both the external and internal validity concerns, these concerns are not completely eliminated. Therefore, to overcome the external validity challenges, it is suggested that researchers: combine field experiments with other research methods; examine the mechanisms through which independent variables affect dependent variables; use appropriate theoretical perspectives to speculate how background factors might affect the outcome variable (Podsakoff & Podsakoff, 2019).

To enhance the internal validity of the results, it is suggested to include mediating variables that examine the mechanism through which the independent variable affects the dependent variable. For example, following the use of field experiments to establish the relationship between process transparency and customer satisfaction, Buell et al. (2017) also used lab experiments to establish that “process transparency increases the degree to which customers perceive employee effort, which in turn increases their appreciation of the employee,

leading to increased perceived value of the service” (p.1688). Efforts like this can help researchers to unravel the mechanisms driving the change and generalize the findings to other contexts. Similarly, Bapuji et al., (2019) used photo-elicitation interviews to identify the processes through which their redesigned routine worked through participant actions to enhance routine effectiveness: understanding of expected actions (through the processes of *interpreting* and *relating*); understanding of action outcomes (through *functioning* and *rendering* processes); understanding of implications for interactions (through *communicating* and *facilitating* processes). In short, by clarifying the research question and hypotheses, researchers can choose an appropriate experiment design and also complement it with additional methods to improve both the internal and external validity of their findings.

3.1.2 Context and research setting

Choosing a proper research setting to test the hypotheses is a critical factor to ensure both internal and external validity. In routines research, a proper research setting is one where routines are widely prevalent, and the hypothesized variables can be easily and most frequently observed. For example, for the study of process transparency, Buell et al. (2017) chose the food preparation process as the research setting because process transparency is relevant and can also be manipulated in that setting.

Once a research setting is selected, the next step is to find an organization that provides access to that setting. Getting access to organizations for field experiments has become less difficult in recent years as managers are now more interested in evidence-based management and development of information technologies (Hauser et al., 2017). In recent years, both researchers and practitioners have become more interested in evidence-based interventions. In routines research, this is an advantage as managers are more interested in evidence of the outcomes of

routines. In addition, when negotiating with managers for access to the organizational setting, researchers can specify the potential positive effects of field experiments on employee attitudes, perceptions, and behaviors about the firm's commitment to the issue under question and to evidence-based management. Such positive effects can potentially increase employee commitment and improve their performance. In our own experience of conducting a field experiment on a towel-changing routine in a hotel, we highlighted reduced workload and improved efficiency due to the reuse of towels as potential benefits to the organization. In turn, the general manager of the hotel commented that it can also reduce the strain on the backs of housekeepers, which was enough incentive to find out, by allowing us to conduct the experiment, whether the intervention would work.

The development of information technology also offers new opportunities for field experiments. In recent years, firms have been focusing on data-driven decisions and thus track data regarding daily operations and performance. This can help researchers to minimize measurement errors and overcome the inference of other background factors as objective measures can induce less bias than subjective measurements (Hauser et al., 2017).

3.1.3 Treatment and design

Once the research setting has been chosen, participants are then randomly assigned to treatment and control groups. However, randomization is hard to achieve sometimes, especially when the unit of analysis is employees in organizations. This is mainly because experimenters might not have the luxury to assign subjects to groups that they do not naturally reside in. For example, in organizations, tasks are completed by participants that are well fitted into organizational structures rather than randomly assigned by researchers. In such a situation,

experimenters might have to adjust their research design or convince managers about the importance of random assignment.

The design of intervention is at the core of field experiments. To eliminate alternative explanations, it is important to make sure that the intervention is precise, and interferences are minimal. In an ideal situation, the control group and treatment group should differ only in one dimension (i.e., the intervention). In designing an intervention, a fair comparison is important. A widely used example of unfair comparison in medical experiments is comparing the survival of a treatment group that takes a pill to cure a condition with a control group that takes a pill that may worsen the condition (rather than a placebo). This comparison is unfair because the treatment group and control group differed in more than one dimension, i.e., they took two different medicines, which makes it difficult to know what caused the observed difference.

To determine whether the intervention worked, experimenters use manipulation checks. However, manipulation checks can enhance the demand effect by cuing participants to expected behaviors. Therefore, experimenters should choose an appropriate timing for a manipulation check. Conducting a manipulation check before measuring the outcome variable might reveal the nature of the study and enhance the demand effect. However, conducting manipulation checks after the outcome measurement might incur bias as the effect might have dissipated. Therefore, manipulation checks can be done in the pilot test stage if the researchers include such a stage. If the manipulation check found that the intervention affected only the dependent variable without affecting other confounds, the intervention is effective (Perdue & Summers, 1986). In manipulation checks, researchers can also account for individual-level variables, such as age, gender, and education to exclude alternative explanations.

3.1.4 Measurement and statistical tests

Depending on the research question, routines researchers should devise measures to capture (i) change in routine and (ii) routine outcomes. When measuring the outcome variable, it is important to achieve both procedural equivalence (different variables should be operationalized in an equivalent way) and distributional equivalence (variance should be equivalent within the population). Also, to mitigate external validity concerns, it is suggested to replicate the manipulation in different contexts and capture outcome variables using alternative measures. If the effect is robust across different research settings and measurements, then the generalizability of findings can be established. To eliminate alternative explanations for the change in a dependent variable, it is important to discuss how background factors might affect or interact with) the treatment effect and measure some background factors and use them as control variables in analyses.

3.1.5 Conducting field experiments

Field experiments involve manipulating participants in a real world and thus, researchers should pay attention to potential ethical and legal issues. First, in field experiments, researchers directly manipulate human subjects, and therefore, experimenters should pay attention to risks that might pose to participation. For example, through changing the organizational processes, researchers might indirectly influence issues of importance to employees, such as performance, compensation, and relationships with others. As a result, field experiments might affect employee wellbeing. Therefore, researchers designing and conducting field experiments should comply with the rules and regulations related to human ethics. Second, in many field experiments, participants are not aware that they are in an experiment. In other words, their participation is not voluntary but imposed, even if it is part of their job description. As

researchers do not take consent from the participants, they should attempt to honor and follow ethics protocols to minimize any concerns. Further, researchers should also pay attention to potential legal issues arising out of experiment conduct or implications of experiment findings, when conducting field experiments.

In sum, to make an effective use of field experiments for research, routines scholars can take a number of steps to clarify the relationships, choose the research setting, design the experiment, select measures, and conduct the field experiment. By taking these steps, routines scholars can study a range of important phenomena.

3.2 Potential research questions suitable for field experiments

Although field experiments are challenging to implement, they also provide an exciting avenue to generate new insights on routine dynamics, i.e., the study of internal dynamics of routines (Feldman, Pentland, D'Adderio, & Lazaric, 2016). According to Feldman et al., (2016), three core observations are intrinsic to research on routine dynamics: action in routines is situated; actors are knowledgeable and often reflective; routines exhibit both stability and change. Therefore, field studies are useful to study routines so that the actions of actual participants can be observed to identify the action patterns that show both stability and change; surveys or interviews are less useful for the phenomenon. Similarly, laboratory experiments cannot reproduce routines because routines emerge from the actions of knowledgeable and reflective actors, not participants who respond to a stimulus. Field studies (e.g., ethnography or case studies) are, however, more prone to researcher biases and preferences, thus making it difficult to verify the explanations or replicate the findings.

Given the above, field experiments are particularly suitable to study routine dynamics because they involve actual participants (i.e., both knowledgeable and reflective) who perform

actions in their natural settings, which generate the pattern of interactions that exhibit both stability and variation. A number of questions related to routines can be empirically studied by using field experiments. However, we would like to discuss the potential of three types of contexts where field experiments are more amenable: fewer participant roles, prominence of artifacts, and online or indirect settings.

First, to study routine dynamics that capture the richness of the effortful and emergent accomplishment, it is important to identify routines where participant roles are fewer. Please note that we are referring to participant roles (e.g., receptionist, customer service representative, waiter, nurse, doctor) rather than participant numbers. By limiting the participant roles, researchers can focus more on the interactions among the participants. Further, background factors that might interfere with the routine can also be minimized by limiting the participant roles. The importance of limiting participant roles for an effective field experiment is also evidenced by past field experiments. For example, the towel changing routine used only two participant roles: housekeepers and hotel guests (Bapuji et al., 2012; 2019; Goldstein et al., 2008; Gössling et al., 2019). Similarly, the dining routine involved only two roles, chef and diner (Buell et al., 2017).

Second, routines in which artifacts play a prominent role appear to be more suitable for field experiments. This is because implementing an intervention using artifacts is easy compared to using individuals, which might introduce idiosyncratic variation in the intervention. Further, managers are more likely to provide access to settings if the intervention involves mundane objects as opposed to intervening in the way knowledgeable and reflective employees act. Additionally, examining the interactions of “lifeless” artifacts with lively actors is theoretically exciting, and can generate novel insights about participant actions in routines. Not surprisingly,

field experiments in past research have used changes in artifacts such as signs and baskets (Bapuji et al., 2012; 2019; Goldstein et al., 2008; Gössling et al., 2019).

Third, given the increasing intertwining of the physical and virtual lives of individuals, online spaces provide a suitable avenue to conduct field experiments with limited interruptions to the natural functioning of organizations. By splitting participants into control and treatment groups and exposing them to different online content (e.g., a changed signature, an inspirational quote, a different webpage layout, a different image, a different duration of exposure), routines researchers can examine recipient actions and the subsequent emergence of action patterns.

In sum, field experiments are a fruitful research method to study routine dynamics and generate novel insights on the emergence and effectiveness of routines. While they are difficult to implement, field experiments can be particularly easy to do in settings that involve fewer participant roles, have prominent presence of artifacts, and intertwine with online spaces.

4 Conclusion

In this chapter, we discussed the advantages and disadvantages of field experiments as well as how field experiments can be used in routine dynamics research. Although field experiments can address endogeneity issues, control measurement, and generate practically relevant and actionable insights for practitioners, researchers relying on field experiments have to deal with internal and external validity challenges and implementation challenges. We recommend researchers to consider field experiments as an option for research questions related to routine dynamics in future research.

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