



Collecting Recollections: Methodological Considerations for Using Experience Sampling Methods in IS and Social Sciences Research

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Abstract:

Developed over 30 years ago, the experience sampling methodology (ESM) aims to measure people's actions, thoughts, and emotions as they occur, which is an appealing prospect for research in IS, organizational, behavioral, and management sciences. Although advances in IT have enhanced its feasibility and various study designs are possible, ESM is not well known in IS research. Although the IT platform and the attributes of the communication technology used to collect adjustment experiences are important considerations for designing ESM studies, successful ESM research ultimately depends upon study participants' acceptance and use of ESM tools, their relationship with the researcher, and their inherent ability to reflect on their experiences as they happen. A pilot study designed to collect individuals' subjective cultural adjustment experiences during global work assignments and preliminary findings are described, and the application of ESM to IS research is discussed.

Keywords:

experience sampling ; retrospective questionnaires ; cross-cultural adjustment ; technology-facilitated communication

1. The Experience Sampling Methodology (ESM)

Made possible by the introduction of beepers and personal digital assistants (PDAs), the Experience Sampling Methodology (ESM) was developed in the 1980s by Csikszentmihalyi and colleagues “to study the subjective experience of persons interacting in natural environments” (Csikszentmihalyi & Larson, 1987, p.526). The design of an ESM study essentially creates an *information system* (IS) that allows the researcher(s) to collect data as study participants go about their day, and technological advancements associated with web-based surveys and smartphone applications have enabled increasing attention and use of ESM in behavioral and social sciences research. Despite its obvious IT/IS dependencies, surprisingly, ESM is not well-known in IS research. We found only one recently published article in a mainstream IS journal that uses this methodology. D’Arcy and Lowry (2019) used an interval-contingent ESM design to test a model of employees’ affective states, attitudes, and compliance with their organizations’ information security policies. This paper describes this methodology and some of the issues associated with using ESM to collect individuals’ subjective experiences in longitudinal field research. A first-hand account of the design, procedures, and lessons learned from a ESM pilot study is described.

1.1 ESM in Social Sciences and IS Research

Information systems research shares many methodological traditions and paradigms with organizational and behavioral research, and researchers have acknowledged the need for field research methods, which enable context and culture to be taken into account (Kaplan & Duchon, 1988). Indeed, researchers in the social sciences have long expressed a preference for assessing and understanding people’s behavior, personality, motivations, etc. by studying people in their natural environment (e.g., Allport, 1937; Fiske, 1971). Qualitative field research methods include open-ended interviewing, observation, and analysis of responses to open-ended survey questions, and quantitative methods frequently involve collecting and analyzing survey data, sometimes before and/or after some sort of event or intervention (Kaplan & Duchon, 1998). All methods have limitations, however, with regard to studying people as they swim (or float) through their “stream of experience.” Direct observation can be intrusive, and investigators cannot observe every context throughout the day or even be present at all in some contexts where key behaviors and responses are likely to occur. Interviews and survey approaches remove subjects from their natural contexts and essentially measure cognitive outcomes rather than the cognitions themselves. “*Cognitive outcomes are the thoughts and feelings experienced before, during, or after social interaction, but always as a response to it*” (Fairhurst, 2001, p. 384). That is, whether they are “in-person” or “technology-facilitated,” interviews and surveys ask study participants to step out of the context of action to recall and summarize past experiences along with present cognitions, which means that the data collected may suffer from memory biases. Memory biases stem from the influence of recent events, salient events, biases of subjective experience, the frequency of events, and general biases based on one’s mood when responding to questions (Beal & Weiss, 2003).

Whether qualitative or quantitative approaches are employed, most scholars would agree that longitudinal study designs that collect data as events occur are preferable to cross-sectional study designs in order to understand whether and how changes occur (Kaplan & Duchon, 1988; Franz & Robey, 1984; Vitalari, 1985). ESM is an option for longitudinal field research that entails giving subjects a signaling device that sends random or interval signals to subjects

in order to understand their activities and their thoughts as they occur (Hurlburt, 1997). When participants receive the signal, they typically fill out a brief form (e.g., Hektner et al., 2007) that asks about activities, persons, thoughts, and emotions, e.g., Where were you and what were you doing when you were beeped? Who was with you? What was on your mind? Subjects might also respond to a short survey to assess how they felt about the activity. For example, in one study, Goetz et al. (2013, p.2081) measured trait anxiety at the beginning of the study by asking “How much anxiety do you generally experience during mathematics classes?” and they measured state anxiety once during each math class over a two-week period by asking “How much anxiety are you experiencing during this class?” Although short forms are most commonly used in ESM, subjects could possibly send an instant message/image (e.g., “Snapchat”) or respond to an automated call. to collect data.

Ecological Momentary Assessment (EMA; Stone et al., 2007; Stone & Schiffman, 1994) is a form of ESM designed to understand behaviors as moments in one’s stream of experience. EMA focuses on collecting real-time data as subjects behave in their natural environment and often includes passive measures that do not rely on subjects’ self-reports, e.g., blood pressure, pulse rate, number of steps, movement tracked by GPS, etc. Participants might also provide entries to a paper or electronic diary throughout the day according to preset schedules (Stone & Schiffman, 1994). ESM focuses on representative activities and subjective experiences, whereas EMA focuses on momentary activities and experiences. ESM may sample as many activities or experiences as possible in order to detect patterns, while EMA will sample activities according to expectations about how and when changes in the focal phenomena are likely to occur. EMA may be a useful IS research approach when, for example, passively obtained information (e.g., logged activities when using a computer or website) can be combined with information or feedback provided by study participants.

1.2 Study Design and Protocols for ESM

As Beal and Weiss (2003) explain, ESM (including EMA) samples a person’s daily experiences at various times throughout the day or when certain events occur; most ESM studies sample experiences over a 1-2 week period. Time-based sampling entails recording responses on a pre-defined “interval-contingent” basis or a random “signal-contingent” basis (Wheeler & Reis, 1991). Most ESM studies use interval contingent signals, and relatively few use event-contingent designs where participants choose when to take a survey based on their experience of an event. An “event-contingent” (Wheeler & Reis, 1991) approach may be more appropriate to study experiences that are not likely to occur on an interval basis. But as Beal and Weiss (2003, p.445) point out, “*event-contingent recording can only work correctly if participants accurately identify the events of interest each time they occur.*”

It is important to note that the rate at which events occur may be highly personalized as well as contextualized. Although ESM studies are often designed to signal participants several times per day over a 2 or 3 week data collection period, the time frame for some types of events can often be much longer. If a researcher does not know when, where, or how often focal events will occur, signal-contingent, time-contingent and context-contingent ESM prompts might not be good options. Despite the introduction of memory biases, in some studies event-contingent sampling may need to rely on individuals’ perceptions of and responses to “critical incidents.” Flanagan (1954, p.327) described the Critical Incident Technique (CIT) for “*collecting observed incidents having special significance and meeting systematically defined criteria.*” Although CIT is usually employed by an observer or

interviewer, it is possible to use ESM questionnaires to collect CIT data. The timing and/or the frequency of critical incidents cannot always be anticipated, however, and so individuals might not immediately recognize these events as they occur. As such, retrospective reporting, in which individuals recall and characterize their experiences, may be useful for collecting descriptions of events. It may be necessary to provide “bursts” that prompt participants to complete a very brief (2-3 minutes) retrospective survey of a recent critical incident.

Barker (1963; 1965) described a person’s overall experience as a series of thematic episodes. Like critical incidents, these episodes are units of activity organized around desired states. For example, Beal et al. (2005, p.1055) describe performance episodes in terms of “*time-bound, transient, and changing*” states organized around behaviors at work. They suggest that performance episodes are more like occasions than task cycles; a person can work on a task on multiple occasions, and each occasion indicates a separate performance episode. “Episode analysis” (Korolija & Linell, 1996; Rankin et al., 2013) entails asking participants to describe and reflect on episodes of their experience and their responses to these episodes. Although this approach may represent “reflection sampling” rather than experience sampling, how people remember events may be more important than how they actually experience them in the moment. When people remember and evaluate activities, they might not average the moments, but reflect on the experience as a whole (Diener & Tay, 2014). Hence, “Retrospective Episodic ESM” may be an option for event-contingent study designs.

1.3 Technology-facilitated Communication Considerations

ESM research is web-based and IT-dependent. Web-based information technology (IT) has had a tremendous impact on data collection techniques and assessment methods in IS, behavioral and social sciences research, especially with respect to collecting people’s experiences. Not only does the internet provide access to information, but it facilitates communication: “*The Internet as an information and entertainment technology would affect education, government, publishing, the retail industry, banking, broadcast services, and health care delivery. The Internet as a communications technology would probably have more subtle and personal effects—on people’s connections to friends, family, and their geographic communities, on the social system of informal support and help, and on the functioning of groups and teams*” (Kraut et al., 1999, p.288).

ESM studies have traditionally relied on paper-and-pencil surveys and beepers or Personal Digital Assistant (PDA) devices, and most ESM platforms today incorporate web-based surveys and smartphone apps. Little attention has been paid, however, to the attributes of the IT as a communication medium. Potosky (2008) proposed a conceptual framework that views assessment as an interpersonal exchange between the person describing experiences (i.e., providing the data) and the person listening to those experiences (i.e., collecting the data). Decisions about the IT platform should begin with expectations regarding the four attributes of the communication medium employed: *Social bandwidth* (the amount of information that can be shared), *transparency* (the degree to which a medium is salient during sharing), *interactivity* (the pace of information sharing), and *surveillance* (the security and privacy allowed by the medium) (Potosky, 2008).

The social bandwidth of the prompts (or signals) needs to be fairly high, and so personal email messages may be appropriate. The platform should be highly transparent such that when they receive a prompt, participants can use the most readily available device to complete the survey. This means that the online survey format (font size, response option

design) must be optimized for smartphone as well as laptop/tablet access. Interactivity may be difficult to optimize given varying internet and device processing speeds at participants' point of access. Because participants will use their own devices, they will likely have some control over the perceived surveillance of the communication technology used for data collection. Still, the security and privacy of ESM responses will need to be negotiated.

1.4 ESM Platform Considerations

Morelli et al. (2017, p.636) defined technology as “*the constellation of individual tools that assist a user with controlling or adapting to his or her environment.*” For example, ESM studies refer to the “platform” to indicate the constellation of IT tools and processes employed to implement the method. As Morelli et al. (2017, p.637) explain, technology-enabled methodologies leverage “*a suite of individual technologies*” that help researchers collect and process more data more quickly and more accessibly. When Csikzentmihalyi et al. (1977) first developed ESM to study adolescents' daily activities, motivation, and reactions, for example, they asked participants to respond to random beeps transmitted by an electronic paging device over a week-long period. Although technical concerns such as mobility, ease of use, and data storage receive a lot of attention, very few ESM studies comment on the communication and relational aspects of the platform that enable the experience-collecting process. The descriptions of the IT platforms for ESM/EMA (see Conner, 2015: <http://www.otago.ac.nz/psychology/otago047475.pdf>) are similarly silent about how researchers should use the IT “*constellation*” to establish and maintain a relationship with study participants.

There are a number of ESM/EMA platforms available, and most require some fairly sophisticated technical support to host a study. Survey Signal is a non-app platform that uses SMS technology to send links to online surveys, hosted by survey platforms such as Qualtrics or Survey Monkey. There are several app-based platforms as well, and these require participants to download an app to their smartphones. For example, PACO, the “Personal Analytics Companion” (<https://pacoapp.com/>), is an open source tool that offers free AppStore (IOS) and GooglePlay (Android) apps for ESM. Currently, Paco cannot be used in the EU or Switzerland, however, because of expectations for data handling in the international agreements. Expimetrics (www.Expimetrics.com) offers academic licenses and 2-week trials to an ESM platform with links to online survey platforms plus options to pay participants and collect location data. Regardless of the platform, researchers must design the study protocol and system of use.

2. Design, Procedures, and Lessons Learned from a Pilot Study

2.1 Theoretical framework and constructs

Scholars have observed the need for cross-cultural research in the IS field (Hunter & Beck, 2000), and in their review of IS-culture studies, Leidner and Kayworth (2006, p. 360) asserted that “*culture is a critical variable in explaining how social groups interact with IT.*” Although not an IS study per se, a field research project focused on cross-cultural adjustment can illustrate study design considerations for using ESM. Potosky (2016) proposed that cross-cultural adjustment is akin to individual adaptation to work (e.g., when changing jobs or employers), and argued that the choice between self and situated-other is made when people encounter unfamiliar, disorienting, “extra-cultural” situations. Adjusting to extra-cultural

events entails performing four psychological adaptation tasks: 1) interpreting or making sense of what happened (*Framing*), 2) acting in certain way (*Behaving*), 3) evaluating one's commitment to assigned goals (*Evaluating Goals*), and 4) managing stress (*Managing Stress*). Characteristics such as personality, self-monitoring, communication style, and cultural intelligence, prior cross-cultural experiences and training, and emotional states (e.g., feeling homesick or isolated) may influence the way a person performs these four psychological adjustment tasks. Overall, in this pilot study, individuals' four adjustment responses represent "critical adjustment incidents" to be sampled in an event-contingent, retrospective episodic ESM study design.

2.2 Participants

Participants in this study were either French nationals selected by the U.S. Fulbright program to work and study in the U.S. for one academic year as foreign language teaching assistants (FLTAs), or U.S. Fulbright Grantees (USFGs) who were awarded a Fulbright grant to work or study in France. All participants in this study were likely to experience extra-cultural episodes in the host country environment. Twenty-seven French FLTAs, (aged 21-29) were selected to come to colleges and universities located across the U.S. during one academic year to teach French and to take classes in English and American history, and 19 FLTAs completed background questionnaires, 13 completed an adjustment outcomes survey, and 10 completed event-contingent adjustment episode questionnaires designed for this study. Fifty-two U.S. Fulbright Grantees (USFGs) visited France during the 2017-2018 academic year, and 35 of these scholars completed one or more background questionnaires, 12 completed one or more event-contingent adjustment episode questionnaires, and 15 completed one or more of an adjustment response rating measure.

2.3 Measures

Several questionnaires were developed for this study. Participants were asked to complete background questionnaires that asked about their demographic characteristics and background experiences as well as psychological characteristics relevant to working abroad. They were also asked to indicate their preferred or ideal way of adjusting in terms of the four tasks. Questionnaires that asked participants to recall and describe episodes and rate their adjustment responses to each of the four adjustment tasks were developed. A survey that asked participants to evaluate their academic, social, and work adjustment was also included.

2.4 Data Collection Process

FLTAs participated in a training and orientation program prior to their arrival in the U.S., and the researcher conducted a brief workshop to invite participation in the study, to explain the extra-cultural adjustment model, to teach participants how to use the questionnaires, and to distribute and collect the background demographics questionnaire. FLTAs were then asked to complete an online questionnaire (using the Qualtrics online survey platform) that measured their personality, communication style, and cultural orientation. Two types of short online surveys were made available to FLTAs: An open-ended form that allowed them to describe specific events during their assignments that prompted them to adjust and to report how they responded using brief web-based surveys, and a short survey that simply asked them to give an event a title, answer a few questions about the context, and indicate how they responded using a quick response survey format. Specifically, for each event participants chose to describe, they were asked to indicate how they learned and made sense of the event, how they

behaved, how they felt about their assigned goals, and how they managed stress. These online surveys took three minutes or less to complete, and could be completed using a laptop, tablet, or smartphone. Throughout their academic year living and working in the U.S., FLTAs received reminders via e-mail to complete these brief online surveys. They were also invited to complete a homesickness measure and an adjustment outcomes survey.

The study protocol for USFGs in France was similar to that of the FLTAs, except that USFGs pursued different types of Fulbright awards for periods of time ranging from two weeks to one year. There was an orientation program held in Paris in September, and a mid-year meeting in Paris in February. Because not all USFGs arrived in France at the same time, not all USFGs attended one or both meetings. A recorded video was used to extend the invitation and training for participating in this study to all USFGs at the September orientation program, and the researcher presented a training workshop in person to USFGs who attended the mid-year meeting. The questionnaires for USFGs were similar to those administered to the FLTAs, with the addition of a special, even shorter version of the adjustment episode form distributed at the mid-year meeting. Participants were invited to complete this short adjustment response survey 9 more times within a 3 week “burst” following the meeting. USFGs were also invited to complete a follow up questionnaire, which included adjustment outcomes questions, within 6-12 months following their return to the U.S.

2.6 Findings

Analysis of the data collected is currently in progress. As with many other longitudinal studies, it was difficult to keep study participants actively engaged in responding to prompts to complete even the briefest questionnaires. Also, the inherent ambiguity associated with what constitutes an extra-cultural episode paired with in situ demands impacted response rates. Neither the frequency nor the format of the questionnaires seemed to make a great difference with respect to these challenges. Participants were encouraged to complete a short survey immediately following each episode, and several reminders were sent via e-mail to prompt participants to take a moment to reflect on their experiences. Asking participants to reflect on past episodes after some interval of time undoubtedly introduced the memory biases that ESM is designed to eliminate. Although there were no technical problems associated with the IT used in this study, the *social bandwidth*, *interactivity*, *transparency*, and *perceived surveillance* aspects of the online survey process could have been better. Perhaps more importantly, more careful consideration of the the design and use of the IS developed for this project might have helped increase the participation rate, frequency, and commitment over time.

3. Conclusion

The pilot field study collected participants’ retrospective, critical incidents and responses to episodes of extra-cultural of adjustment over an extended, varying time period. The web-based technology and ESM platform worked beautifully, but ultimately the study depended on participants’ acceptance and use of the data collection system and their commitment to engaging in the reflection necessary to share their experiences. ESM and its variants offer viable options for IS research, but there is much to consider regarding study design and participants’ ongoing active engagement with the ESM platform.

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