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A pragmatic multi-method investigation of discrepant technological events: Coping, attributions, and 'accidental' learning

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ABSTRACT

Discrepant technological events or situations that entail a problem, a misunderstanding or a difficulty with the Information Technology (IT) being employed, are common in the workplace, and can lead to frustration and avoidance behaviors. Little is known, however, about how individuals cope with these events. This paper examines these events by using a multi-method pragmatic approach informed by coping theory. The results of two studies – a critical incident study and an experiment – serve to build and test, respectively, a theoretical model that posits that individuals use a variety of strategies when dealing with these events: they experience negative emotions, make external attributions, and adopt engagement coping strategies directed at solving the event, eventually switching to a disengagement coping strategy when they feel they have no control over the situation. Furthermore, users' efforts may result in 'accidental' learning as they try to overcome the discrepant IT events through engagement coping. The paper ends with a discussion of the results in light of existing literature, future opportunities for research, and implications for practice.

1. Introduction

When computers are used daily by almost every employee in an organisation, even a minor technical problem can cost thousands of dollars in lost productivity unless dealt with quickly [57,p. 100].

Magazines provide tips to deal with technological interruptions [Professional Manager,1], information technology (IT) managers describe instances of shattered monitors and other broken technologies as a result of "technology rage" [62], and employees report that many of their IT interactions are wasted on frustrating experiences [46]. Studying such experiences is important not only due to productivity losses but because they add up over time and influence future IT continuance decisions [11,15,17], extended IT use [72], and well-being through technostress [83].

Difficulties with IT can arise from discrepant IT events, that is, those occurring when an IT interaction does not match one's expectations [8,39,67]. A discrepant IT event occurs when a technology does not behave according to plan or when a user cannot make use of the application while working on a work-related task [10,67]. Despite their prevalence [e.g.,46], little is known about the processes by which people deal with discrepant IT events.

As a result, this study investigates the following research question: how do users cope with discrepant IT events? In order to address this question, we take a pragmatic approach using both deductive and inductive theorizing [77]. First, we review literature that informs our research in a deductive way, using coping theory to draw conclusions about how users deal with discrepant IT events. Second, we refine these conclusions with the inductive analysis of data from a critical incident study. Drawing on study findings, as well as other theoretical perspectives (attributions and accidental learning), we develop theoretical propositions. Finally, the resulting model is validated with an experiment.

This study contributes to the literature in several ways. It shows how certain processes that are believed to occur before the coping responses start, such as deciding if a situation is changeable, actually take place after individuals have engaged in coping responses aimed at overcoming the situation. Furthermore, the results show that learning is not the exclusive outcome of formal

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intentional effort as most of the literature implies, but can result "accidentally" as a by-product of the coping process [e.g.,63]. Finally, by studying discrepant IT events, this study addresses recent calls for studies concerning the direct effects of technology on triggering users' behaviors [65].

The rest of the paper is organized as follows. First, we present a review of coping theory as it applies to users' adaptational responses to discrepant IT events. Second, we report on a critical incident study, together with the development of theoretical propositions that draw on not only study findings but also coping, attributional, and learning theories. Third, we describe an experiment, which serves to corroborate the temporal sequence implied in the developed propositions. Finally, the article ends with a discussion of this study's contributions to theory and practice, as well as future opportunities for research.

2. Theoretical development

Using a behavioral approach, IT use has been defined as a person's interaction behaviors, including the activities performed to adapt and modify the technological context, in which the task takes place [5]. Therefore, this perspective on IT use includes adaptations to discrepant IT events. Interestingly, it overlaps with the notion of adaptational responses to the environment found in coping theory, which represents an adaptational cognitive and behavioral effort to manage relations with the environment [49]. More specifically, coping can be defined as individuals' cognitive and behavioral efforts to adapt to and deal with specific environmental demands that generate emotional discomfort (e.g., stress) [31]. As a result, coping theory appears to be a good fit from which to start analyzing the process by which users adapt and deal with discrepant IT events.

In general, IT research on coping is quite scarce. A notable exception is the work by Beaudry and Pinsonneault [8,p. 496], who conceptualized coping as user adaptation, or "the cognitive and behavioral efforts exerted by users to manage specific consequences associated with a significant IT event that occurs in their work environment." Although there are many IS studies that cite coping theory, an examination of them shows that most of them refer to coping in the discussion section [e.g.,44], or to justify a relationship between variables without actually examining coping [e.g.,51]. The few studies that apply coping theory have been aimed at studying employees' coping processes when a new IT is introduced in the work setting [e.g.,7,8,22,37]; users avoid malicious IT [e.g.,52,55]; or users from different countries deal with rapid technological change [e.g.,26]. By contrast, little research has been directed at ways in which users cope with the technology once it has been adopted and is being used [see 67 for an exception]. This is somewhat surprising because a considerable amount of research in IS has been directed toward negative reactions [e.g.,computer anxiety,16] to technology and coping provides an appropriate theory from which to examine them.

2.1. Coping theory and discrepant IT events

During interactions between individuals with their environments, there are two appraisals that occur concurrently when an event takes place: primary and secondary appraisals [49]. During primary appraisals, individuals map an event with its potential consequences for their well-being: (1) negative, if the event is perceived as threatening; (2) positive, if the event is seen as improving well-being; and (3) irrelevant, if the event is perceived as neutral [49]. Negative events generate stress, or the emotional state resulting from an imbalance between demands by the environment and individuals' resources [49]. Stress is seen as a precondition for coping responses to take place. That is, the coping process starts when an event is perceived as "negative" for well-being and thus generates stress [49]. Because discrepant IT events correspond to difficulties, problems, and misunderstandings with the IT being used [85], they can be seen as a particular case of the negative events that trigger the coping process.

During secondary appraisals, individuals assess the resources available to alter the negative event or situation [49]. These resources refer to what is at one's disposal for dealing with the situation rather than to the actual way in which individuals deal with the event [69]. The two concurrent appraisals prepare individuals for action in the form of different coping responses [49,74].

The literature on coping has identified a wide variety of coping responses [78][see 78]. For example, Skinner et al. [78] reviewed over 100 assessments of coping and found over 400 labels used to describe categories of coping. Among the most widely recognized categories of coping are those of engagement/disengagement [14,36] and problem- or emotion-focused coping [47,49,69]. In this study, we will use the former approach rather than the later for two main reasons. First, the engagement/disengagement categories are exclusive distinctions, whereas the problem- or emotion-focused are not [12,48], and thus predictions about the latter are often unclear. Second, it has been argued that the problem- or emotion-focused categories are hard to evaluate and some factor analysis studies were unable to support them [56,78]. Finally, the engagement/disengagement categories represent the coping process well in real life [12].

In general, if users appraise the discrepant IT event as changeable (they feel they have the necessary resources to change it), they are more likely to adopt engagement coping [29,50]. Engagement strategies encompass what has traditionally been labeled as problem-focused and some instances of emotion-focused coping: they are coping mechanisms directed to managing the event that is the source of the discomfort, or the negative emotions that result from the event [12]. They entail a wide range of activities, such as trial-and-error, gathering information, and help-seeking activities [36]. Overall, engagement coping encompasses responses directed toward the modification of the negative situation through the elimination or alteration of the very source of negative discomfort [14,69] (Fig. 1).

By contrast, when individuals think they cannot do anything to change a situation (i.e., they do not have the necessary resources), they will use escape coping (disengagement strategies) [29,50]. Disengagement coping encompasses strategies that are directed toward escaping from the negative situation or the negative feelings that the situation generates [12]. That is, during disengagement coping, behavioral and cognitive efforts are no longer aimed at overcoming the situation; rather, they are concerned with some other activity that provides distraction from the negative emotion [36]. In the case of discrepant IT events, disengagement coping may entail users resuming the task they were addressing before the discrepant IT event occurred, or if the event is fatal and prevents them from doing so, engaging in other tasks unrelated to the event.

There are two fundamental characteristics of coping. First, coping is a dynamic process, indicating that its focus is on the explanation of the person's behaviors and thoughts as well as on how these change as the situation unfolds over time [31]. Second, coping is contextual: each person subjectively evaluates the encounter with the environment and the available resources to manage it [31]. In summary, coping entails a dynamic interaction between a person and the event, including attention to how circumstances and behaviors change as the situation develops [13]. As a result, coping is modified and adjusted as the potentially harmful encounter unfolds: after the coping mechanism has been executed, there is a reappraisal of the person–environment