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Affect and acceptance: Examining the effects of positive mood on the technology acceptance model

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ABSTRACT

While the technology acceptance model (TAM) is generally robust it does not always adequately explain user behavior. Recent studies argue that including individual characteristics in TAM can improve our understanding of those conditions under which TAM is not adequate for explaining acceptance behavior. Using this argument, we examine the effects of positive mood, one individual characteristic that significantly affects an individual's cognition and behavior, on acceptance of a DSS that supports uncertain tasks. Our results show that positive mood has a significant influence on DSS acceptance and that its influence on users' behavior is not due to a halo effect.

1. Introduction

Decision support systems are among a class of systems used to support managerial decisions and actions [68] and thus their successful adoption is of great importance for organizational performance. Despite being useful decision making tools, these systems are not always readily accepted by their users [78]. Consequently, the technology acceptance model (TAM) [16], which is often a reliable predictor of user acceptance of a new technology, has been used in many DSS studies to examine adoption behavior [53]. TAM, however, has been recently criticized for focusing primarily on external factors (e.g., users' perceptions of ease of use and usefulness of a system) and not paying enough attention to internal factors that affect cognition and behavior, specifically users' individual characteristics [58–60]. For example, TAM loses its predictive power when certain individual characteristics, such as one's preference for unstructured situations are considered [60]. Such results underline the need for acceptance studies that examine individual characteristics, especially those characteristics that affect cognition and behavior.

To address this need, our DSS adoption study examines one individual characteristic that significantly affects cognition and behavior, namely users' affective state, i.e., their moods and emotions. While the acceptance literature acknowledges the role of affect in adoption behavior [56], it primarily focuses on the affective reactions (attitude) of users toward the use of IT, not their affective state (moods and emotions) when they are introduced to IT [56]. While "how people feel about a technology" is highly relevant to the acceptance literature, theoretical and empirical findings in various fields suggest that "how people feel in general" is also highly relevant to adoption of a new DSS. Our affective states provide an underlying framework for our thoughts and behavior [28]. They are a necessary component in rational decision making (for a review of this literature see [15,62]). Because of their essential role in how we make rational choices [36,62], affective states are likely to influence whether we choose to adopt a DSS. Examining the role affect plays in DSS acceptance can help to identify conditions under which ease of use and usefulness may not be enough to predict DSS adoption [e.g., 53,60]. Given the importance of DSS in organizations [12], such an examination is of both theoretical interest and practical value.

2. Background

This section provides a review of the theories used in this study. It starts with a short review of the technology acceptance model and

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explains briefly the importance and relevance of affect in the DSS acceptance literature.

2.1. Technology acceptance model (TAM)

TAM is one of the most influential Information Systems (IS) theories. It is solidly grounded in the Theory of Reasoned Action [2], a psychological theory that explains users' intention to perform a behavior. For TAM, the behavior being considered is using an IT. Thus, the outcome construct in TAM is users' behavioral intention (BI) to use an IT. In TAM, BI is influenced by Perceived Usefulness (PU), defined as the degree to which individuals believe using the system would improve their performance [17], and Perceived Ease of Use (PEU), defined as the degree to which individuals believe using a particular system would be effortless [17]. Furthermore, PEU influences PU [17].

While many TAM studies support both PU and PEU as significant direct effects on BI and the resulting usage, other studies have found that PEU has stronger effects through PU than as a direct effect on BI. Some researchers argue that the mixed results for the direct effect of PEU on BI in TAM are task related [53], and thus have suggested that careful task specifications could be a useful addition to TAM studies [19]. Although individual-level technology adoption research, e.g., TAM-related research, is one of the most widely studied areas of IS research, there are still a number of productive research avenues, including the role of individual characteristics that influence cognition [60], such as affect [56], which is the focus of our study.

2.2. Affect and rational decision making

There is substantial evidence supporting affect as a necessary and important component of rational decision making. As neuroscience studies show, making rational choices without affect is at best impractical, at worst impossible [15]. For patients who cannot process feelings due to brain injuries, rational decisions — as simple as setting up an appointment — become a continual process of evaluating all possible alternatives, ranging from different appointment times to possible fluctuations in weather conditions [15]. While a process that checks all possible alternatives provides an optimal solution, it is very lengthy, mentally taxing, and impractical. Consider the number of decisions or choices one makes in a day. Checking all possible alternatives of all decisions would not only be mentally exhausting, but would also be nearly impossible given the limited hours in a day.

Affect works in conjunction with our rational calculations to stop us from exhaustive exploration of every imaginable alternative [15,62]. Rather than evaluating all possible alternatives, affect helps us eliminate those that do not “look right” or “feel right” so that we explore only a manageable subset of possibilities. Thus, a rational actor when making decisions is executing a combined sequence of cognitive and affective processes [15,62].

2.3. Affect: moods vs. emotions

Affect refers to one's feeling state or how one feels when performing some task or activity [33]. Thus, affect is defined as one's moods and emotions [30,32]. While moods and emotions are both affective states they differ in intensity, specificity, and pervasiveness. Moods are less intense affective states than emotions [30,32]. Unlike emotions, moods do not necessarily have a specific cause (e.g., a provocative act) or a target (e.g., target of anger) [28]. Unlike volatile emotions, moods are pervasive and enduring. Because of these characteristics, moods provide a suitable affective framework for studying cognitive processes, particularly in an organizational context [28]. Hence, our study of affect and DSS acceptance behaviors focuses on moods, not emotions. While affect refers to both moods and emotions, when we use the term “affect” in this paper, we are focusing on moods rather than emotions.

2.4. General mood categories: positive, negative, and neutral

While there are many specific moods, e.g., sadness, joy, fear, happiness and frustration, mood states in research studies are typically grouped into more general categories such as positive, neutral, and negative mood based on theoretical and empirical arguments [10]. Furthermore, the theoretical foundation for positive mood differs from that for negative mood [30]. Thus, focusing on a single mood category and its theoretical foundation facilitates making sound theoretical and empirical contributions [30,43].

In this study, we focus on the effects of positive mood on acceptance of a DSS. The effects of positive mood on cognition are robust across tasks, including solving anagrams, doing word associations, choosing among items, and diagnosing cancer [e.g., 25,26,44,49,52], across contexts ranging from traditional laboratory settings to hospital settings [e.g., 26,51,63], and across populations ranging from undergraduate students to senior medical students to practicing physicians [e.g., 25,26,49]. Thus, positive mood effects are likely to extend to the DSS acceptance context as well.

2.5. Positive mood theory

This study is grounded in the positive mood theory [43] a prominent psychology theory. According to the positive mood theory, being in a positive mood influences how our thoughts are organized and accessed. The organization and accessibility of our thoughts, in turn, influence what comes to mind first or most easily, which shape our decisions [43]. When individuals are in a positive mood, they have access to a network of positive material in their cognitive system which is diverse, elaborately connected, and flexible. Because positive material in one's memory is rich and elaborate, when in a positive mood one has access to an abundant quality and quantity of positive thoughts to aid in one's cognitive processes [30,43]. For example, an elaborate network of positive thoughts can facilitate careful, elaborate, and systematic evaluations ([for reviews of this literature see 43]). Because adopting a new DSS often calls for careful evaluation, users' positive mood may play a role in whether or not they choose to adopt a DSS. Moreover, because mood effects hold in an organizational context [28], examining positive mood effects on DSS adoption can have important practical implications for managers.

2.6. Task characteristics and positive mood effects

Task characteristics play a crucial role in studies of positive mood effects [43]. According to positive mood theory [43], being in a positive mood state can significantly improve an individual's cognitive processing. Such improvements, however, do not always yield better performance; they depend on the task, i.e., whether the task requires the enhanced cognitive capability of people in positive mood [40]. For example, people in a positive mood outperform their control counterparts in complex tasks such as diagnosing cancer (in which their ability to see more varied aspects of stimuli and to integrate those aspects into decisions more efficiently is beneficial), but not for simple tasks such as searching for a specific sequence of letters in text (in which such cognitive abilities are not needed). Deciding whether or not to adopt a new technology, such as a DSS, requires cognitive abilities beyond those needed for simple tasks. As a result, being in a positive mood is likely to affect DSS adoption behavior.

In this study we examine the effects of positive mood on adoption of a DSS that supports a complex planning task [66].[3] Planning

[3] “Campbell (1988) developed a topology of task complexity that incorporated earlier work in the area (Payne 1976, Wood, 1986). In his topology, the production scheduling task would be assigned high ratings on three of his four complexity measures (presence of uncertainty, conflicting interdependence, and multiple paths to the desired end states). Thus it is a reasonably complex real decision task and should avoid the criticism of simplistic task used in some studies.” [66, p. 96].