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Does Affect Mediate Information Overload? A Dissertation in Progress

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Extended Abstract

The problem of information overload and ways to reduce it has been the focus of many researchers in the MIS literature (e.g. Yang et al. 2003, Farhoomand and Drury 2002, Lau et al. 2001, Chan 2001, Lin 2000, Grisé and Gallupe 1999, Tuttle and Burton 1999, Mendelson and Pillai 1998, Iselin 1989). The technological advances of the past few decades in the field of computer science and information technology have made it possible to make large volumes of data available anyplace anytime.[1] Although Information Technology (IT) has been instrumental in improving the flow of information it has been also instrumental in creating an overload of this same information for businesses and organizations (Farhoomand and Drury 2002, Mendelson and Pillai 1998). For example, the results of a recent survey of managers in a variety of industries shows that the majority of managers are faced with the problem of information overload on regular basis and complained that information overload has negative effects on their work (Farhoomand and Drury 2002). My dissertation is motivated by the ubiquitous nature and continually growing magnitude of the information overload problem. In this work, I intend to investigate the problem of information overload from a cognitive point of view.

A large body of the studies that examine the effects of information overload (Grisé and Gallupe 1999, Tuttle and Burton 1999, Schick and Gordon 1990, Chewning and Harrel 1990, Iselin 1989, Iselin 1988, Snowball 1980) are based on the work of Schroder and his colleagues (1967). In their work, Schroder et al. (1967) examined the relationship between an individual's level of information processing and environmental complexity and proposed a conceptual model presented as an inverted U shape that can predict the information processing pattern that people tend to use. According to this model (Schroder et al. 1967), which views the decision maker as a system that processes information inputs into decision outputs, one's ability to process information increases with increases in environmental complexity, but only up to a point. When the environmental complexity surpasses this optimal point, the decision maker begins to experience information overload and his or her level of information processing begins to decrease. In other words, this model suggests that a decision maker's level of information processing is constrained by his or her cognitive structure.

Recent research in psychology has shown that affective states such as positive mood can regularly and significantly influence one's cognitive structure, flexibility, and information processing style (Isen 2000, Isen 1993, Forgas 2000). For example, this literature reports that people in positive mood tend to have a rich and flexibly organized cognitive context (Isen 2000, Isen 1993, Murray et al. 1990, Isen et al. 1985, Isen and Daubman 1984) that enables them to be creative and efficient problem solvers (Isen et al. 1991, Isen et al. 1987, Isen and Means 1983). In the light of these psychological studies, it is reasonable to believe that mood may mediate the effects of information overload. That is, it is reasonable to expect that people in positive mood to perform better than their control counterparts under the conditions of information overload. Thus, my dissertation intends to extend prior work on information overload by establishing mood as a mediating variable in the existing model.

The first phase in investigating the mediating effects of mood on information overload is to establish that mood does indeed have an impact on judgments. This pretest of concept was the subject of my recent study (Djamasbi 2002) that investigated the effects of positive mood on a production scheduling managerial task. The scheduling decision used in the task was based on the Holt et al. (1960) model of a production-scheduling problem and was calibrated with real data from a glass manufacturing company. The

[1]The Total Information Awareness Program and the Computer Assisted Passenger Prescreening Systems that intend to link databases of personal information and scan them for signs of possible terrorist threats are two prime examples of our current Information Technology capacity and potentials.

subjects were expected to use five statistically independent informational cues and an outcome feedback, which were provided by a DSS, to estimate the production volume for a manufacturing company. Positive mood was successfully induced in the experimental group by giving the subjects a small surprise gift of chocolate and candy wrapped in colorful paper prior to performing the task. The analysis of subjects' judgments revealed that people in positive mood compared to their neutral mood control counterparts utilized more cues and made more accurate judgments.

It is important to note that the above study (Djamasbi 2002) investigated the effects of mood on a managerial judgment without considering the information load. Thus, the next phase of my investigation builds upon this pretest of concept (Djamasbi 2002) and extends the investigations of the effects of positive mood on cue utilization and judgmental accuracy to include information overload. To do so, however, the environmental complexity of the experimental setting must first be calibrated to represent the conditions of information overload. One way to calibrate the environmental complexity of an experimental setting is by manipulating its task predictability (Bonner 1994, Campbell 1988, Wood 1986). Through a simulation study, a set of task predictabilities (R_e) will be generated from which three task predictability levels R_{e1}, R_{e2}, and R_{e3} will be selected to represent information load levels LL_1, LL_2 and LL_3 where $LL_1 < LL_2 < LL_3$. A pretest will be used to verify that these loads levels LL_1, LL_2, and LL_3 are indeed representative of information overload levels (i.e. all reside on the second half of the bell-shaped curve).

Once the load levels LL_1, LL_2, and LL_3 are verified to represent the conditions of information overload, a second experiment will be conducted to examine the performance of subjects in positive and neutral mood under these information overload levels. It is important to note that to examine the impact of positive mood on judgments under the condition of information overload, not all three load levels are needed. Because each load level LL_i represents an information overload condition, only one of these load levels is needed to show the impact of positive mood on judgments. However, examining the effects of positive mood on judgments under all three load levels not only provides a more robust experimental design, it also provides the opportunity to examine whether decision behavior of people in positive under the conditions of information overload follow the same pattern as predicted by Schroder et al. (1967). Thus, the second experiment will be arranged in a 2 (treatment: positive vs. neutral mood) X 3 (load level: LL_1, LL_2, LL_3) fashion. Although I expect to observe a decrease in performance in all groups as a result in an increase in complexity, as the information processing theory predicts, I hypothesize that the performance of the positive mood group will be significantly better at each complexity level than their control counterparts. That is, I expect to observe that 1) the inverted U shape pattern of information processing extends to performance of people in positive mood under conditions of information overload, and 2) that at each load level LL_i people in positive mood utilize more information and make more accurate judgments compared to their neutral counterparts.

This study has important theoretical implications for existing theories of information overload. First, this study extends the existing theories of information overload by directly examining the role of affect as a mediator in these models. Second, the study has the potential to show a significant performance improvement in areas where the information load literature has reported to be problematic.

The results have also important implications for the design of a DSS. Isen (1984) argues that positive affect is very common: "compare the number of times that you laughed today, with the number of times you cried" (Isen 1984, p. 187). Thus, paying attention to how the system's interface may interact with users' feeling state (e.g. whether it diminishes or sustains a positive mood) can potentially lead to building more effective systems.

Similarly this study may have important practical implications as well. Since this study investigates the influence of affect on performance under conditions of information overload, it has the potential to provide managers and organizations with additional information to increase productivity by paying attention to their organizational climate and hence the feeling states of their employees.

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