

## Beyond Cognitions: A Call for Greater Consideration of Emotion in Information Systems Decision Theories

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### Abstract

*Emotion has been identified as a salient dimension of organizational life and this has led to the emergence of a growing body of literature that suggests its importance to a wide range of behaviors. Salient among these behaviors is decision making and it is therefore argued that adequate consideration must be made for the role of emotion in the development of information systems (IS) theories related to decisions and decision behavior. Failure to consider emotion in such contexts can result in models that overlook important theoretical dimensions and can impose needless limits on our understanding of IS phenomena related to decision making. A review of the potential impact of emotion on decision making is offered to highlight some implications for IS theory. Suggestions for future research incorporating consideration for emotions are also offered<sup>1</sup>.*

### 1. Introduction

Recent years have witnessed a dramatic increase in the research attention given to the role of emotion in organizational life and this attention has yielded a growing body of literature within the fields of organizational behavior and organizational theory [1-3]. The opportunities identified by this literature suggest that research examining the role of emotions in organizations has the potential to make significant contributions to the development of management thought and practice over the coming years [4]. Recent research highlighting the powerful impact of emotions on decisions and decision processes further suggests that emotions may play a particularly important role in relation to decision making processes [5, 6]. This paper therefore seeks to draw greater attention to the potential importance of emotion to the development of theories related to decisions and

decision behavior within the field of information systems (IS).

The management and psychological literature generally recognize emotions, moods, and personality traits of an emotional nature (e.g. optimism) as the three broad affective states experienced by individuals [7]. Of these three states, emotions are the most intense, being short-lived and typically directed toward a specific target. In contrast, moods can persist for periods of time ranging from a few minutes to several weeks and are usually more diffuse in nature. Emotionally oriented personality traits such as optimism and pessimism reflect even greater stability, being characterized as broad tendencies to view situations in a particular manner. Such traits are subject to only limited variation over time.

Of the three affective states, it has been argued that emotions are most likely to impact behavior and performance [4]. A vast body of literature has identified emotions as impacting a wide range of organizational behaviors including employee performance, creativity, turnover intentions, leadership, and decision making [2]. Recent research indicates that the impact of emotions on organizational and individual decision behaviors may be particularly salient [3, 8, 9]. It has been suggested that even the most rational aspects of decision making are significantly impacted by emotions [3] and we therefore argue that failure to adequately account for emotions in IS theory related to these behaviors risks overlooking important theoretical dimensions. By excluding potentially important causal constructs, such oversights can impose needless limits on our ability to understand decision behavior. We therefore see adequate consideration for the role of emotion in decision making as essential to the development of full and adequate accounts of many important IS phenomena. Providing such accounts can be expected to not only improve the explanatory power of research in the field but also to yield valuable insights for practitioners.

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The importance of emotion to IS theories related to decision phenomena will be elaborated upon in the following discussion. This elaboration will commence with a discussion of decision making that identifies two research streams within the field that are closely linked to decision making. These streams will be used as examples in subsequent discussion that examines the three broad categories of impact that emotions can have on decision making and how the impacts identified in each category can influence theory development.

## 2. Decision making

Decisions can be defined as expressions of preference for one alternative over others and a vast body of research related to decisions and decision behavior has accumulated over the past several decades [10, 11]. This research has been influenced by work originating in a wide range of disciplines including economics, psychology, and marketing. Although an extensive array of constructs and processes related to decision making have been examined, Payne et al. [12] identify the decision maker, the decision problem, and the decision context as the three key dimensions of decisions. Given the focus of this paper on emotions, the decision maker is the dimension of particular interest in the following discussion.

Much of the judgment and decision making literature has relied primarily on cognitively-based theories and has generally assumed that decision makers make choices through processes of rational analysis [5, 13]. A great deal of the research that does incorporate emotions tends to view them as simple consequents of decisions [14]. Research is, however, increasingly reporting that emotions can significantly influence decision processes [1, 3, 15] with some recent work recognizing that even similar emotions can have distinct implications for decisions [16]. Our understanding can thus be seen as moving from a relatively simple understanding of emotions as by-products of decisions toward an increasingly sophisticated understanding of the causal and consequential implications that emotions have for decision making.

The growing recognition of the significance of emotions to decision making has important implications for a notable portion of the research conducted within the field of IS since, as decisions and decision behavior can be seen to be at least loosely related to many research streams in the field. In this paper we focus on two of the more salient of these streams, namely the research surrounding IS adoption decisions [17] and research exploring the diverse set of decision aid technologies intended to enhance the effectiveness of user decisions [18]. We choose these two streams to demonstrate the

importance of emotions to IS research both because they are salient in our field and because they represent two different decision processes: one viewing technology as a decision object and the other viewing technology as a decision aid.

Understanding the potential impact of emotions on decision behavior in these two contexts can be expected to be of considerable utility to researchers and practitioners alike. As prominent research streams that have received considerable research attention, both streams provide useful contexts for demonstrating some of the implications that emotions can have for IS theories related to decision making phenomena.

## 3. Emotions and decision making

Emotions represent complex psychological and physiological states and are seen as indicating the extent to which an individual considers some object or outcome as more or less desirable [19]. Extensive research effort has been directed toward characterizing emotional experiences in terms of their underlying dimensions with this effort generally identifying pleasantness/unpleasantness and level of arousal as the two most reliable dimensions of emotions [20].

Despite the presence of some ambiguity in the literature, it has been suggested that substantial agreement exists surrounding the nature of emotions [21]. Hence, the distinctiveness of emotions from other mental states is thought to be based on their cognitive antecedents, intentional objects, level of physiological arousal, physiological expressions, valence, and action tendencies [21]. In other words, emotions are distinct from other mental states because they are triggered by cognitive beliefs rather than sensory signals, they are about a specific object, they are associated with a state of physiological arousal, they have characteristic expressions such as a smile or a frown, they are typically experienced as highly negative or highly positive, and they are generally associated with an action tendency such as the desire to flee or to destroy.

It is now widely accepted that emotions can exhibit sometimes powerful influences on decisions and these influences can either improve or diminish decision making effectiveness [5, 9, 21]. There is even some suggestion that effective decision making is not possible in the absence of emotions [3]. Emotions are thought to improve decisions in at least two ways [21]. First, they can encourage a decision maker to make a decision which is often preferable to making no decision. Second, emotions can guide decision makers to an optimal decision. It has, for instance, been found that under certain circumstances emotions can advantageously bias judgments [19]. Considerable research has, however, also

demonstrated the negative consequences that emotions can have upon decisions and decision making [3]. Emotions have, for example, been reported to delay apparently necessary decisions and to inhibit effective decision making processes [3].

Building on our review of the literature surrounding the role played by emotions in decision making, we suggest that the impact of emotions can be categorized using two dimensions. The first of these dimensions makes a distinction between research that examines the impact of emotions that are *directly related* to the decision and research that examines how *unrelated* emotions can impact decisions through their influence on such things as the decision process [16]. An example of an emotion that is directly related to a decision would be the enthusiasm that a decision maker has for a technology that he or she is contemplating purchasing. An example of an unrelated emotion would be the anger the decision maker feels as a result of being caught in traffic coming home on the day when he or she was planning to purchase the technology.

The second dimension of emotional impacts on decisions is based on a distinction between the actual emotions which precede a decision and the anticipated emotions that a decision maker expects to arise following a decision [5]. Building on the preceding example, the enthusiasm that a decision maker has for a technology would be considered an actual emotion while the frustration that he or she expects to feel when installing the technology would be considered an anticipated emotion.

Relationship of Emotion to Decision	Related	Anticipatory Emotions	Anticipated Emotions
	Unrelated	Emotional Context	Not Applicable
		Actual	Anticipated
		Nature of Emotion	

**Figure 1. Potential impact of emotions on decision making**

We combine these two dimensions in Figure 1 to create three categories of emotions. Since the literature gives little or no consideration for how unrelated, anticipated emotions impact decisions, this quadrant is marked as not applicable and will not be discussed further. The influences identified in the three salient quadrants of Figure 1 are emotional context, anticipated emotions, and anticipatory emotions. We elaborate on each of these three categories of influence in the following discussion which also seeks to identify some of

the expected implications for IS research that are associated with each.

### 3.1 Emotional context

Contextual emotional influences are those influences on a decision that result from the presence of emotions unrelated to the decision problem. Emerging research is beginning to identify some of the important influences that such emotions can have on decisions [e.g. 6, 22]. Among these are findings that subjects exhibit reduced cognitive processing and an increased tendency to punish others when they are angry even though the source of their anger is unrelated to the punishment decision [22]. Making subjects accountable for even unrelated decisions appeared, however, to reduce this punitive tendency. Such findings highlight the potential importance of the emotional state of a decision maker to the choices that he or she eventually makes. They also suggest that decision makers may not recognize or fully understand the extent to which their decisions are impacted by their emotions [22].

Negotiation research has found that, in addition to being influenced by personal emotions, decisions can also be influenced by the emotions of others. Van Kleef et al. [7] report, for example, that negotiation participants made greater concessions to angry negotiation counterparts. This tendency was, however, only observed when the situation was such that the participants were motivated to consider these emotions by such factors as low time pressure and the high power of their counterpart. The importance of motivation in this context suggests that, in contrast to personal emotions, the influence of the emotions of others on decisions is more likely to operate through cognitive evaluation processes.

Motivations have also been linked to the impact of emotions on decision making by dual-process models of information processing [7]. Such models make a distinction between the ability of an individual to process information and his or her motivation to do so, suggesting that decision makers tend to either process information quickly using heuristics or in a more deliberate and systematic manner depending on their level of motivation. Decision maker motivation to adopt one information processing strategy over the other has been shown to be influenced by the general emotional state of the decision maker [14]. Individuals experiencing positive emotions have been found to rely on heuristic decision processes [9] while the experience of negative emotions tends to encourage more systematic information processing and more realistic evaluations [4]. Since the decision making strategy that is selected can significantly influence decision outcomes, these findings further highlight the

relevance of emotional context to theories related to decisions and decision behavior.

The emotions of others have also been found to impact decision making processes through such mechanisms as emotional contagion [23]. Emotional contagion sees the emotions of teams and work groups as tending to converge over time and research suggests that positive contagion can lead to reduced conflict and greater cooperation in comparison to situations characterized by negative emotional contagion [23]. The salience of emotional contagion may, however, be greater for negative contagion given that negative emotions have been reported to be more “contagious” than positive emotions [3].

### 3.1.1 Implications of emotional context for IS theory.

The preceding discussion suggests a number of important implications for theories of IS adoption and theories accounting for the effectiveness of decision aid technologies. In broad terms, research related to emotional context suggests that the emotional state of a decision maker at the time of a decision can significantly impact decision processes and decision outcomes.

In the context of technologies intended to support decisions, the tendency of decision makers experiencing positive emotions to rely on heuristic decision making suggests that such individuals may be less likely to engage in the use of decision aids or to only superficially process the advice offered. In other words, those who do use these technologies may do so only casually. Hence, theories attempting to account for the effectiveness of decision aid technologies might benefit from greater consideration of such possibilities.

The significance of emotional context to decisions also suggests the importance of understanding the extent to which emotional context impacts the willingness of decision makers to act upon the advice or information provided by decision aid technologies. Emotional context research indicates that decision makers will process the same information differently depending on their emotions. This can result in different assessments of the significance of this information and, as a result, variable willingness to act upon it.

Another implication of emotional context research relates to the increasing ubiquity of technological mediation in decision processes. This prevalence indicates a need to better understand a number of aspects of how emotion is communicated via technologically mediated channels [2]. Research has found, for instance, that the use of technology mediated communication can require the development of new means for communicating emotions [24]. It has also been reported that individuals are not especially effective in accurately conveying their emotions when using text-based communication technologies [25]. Limitations of this kind can impact the

extent to which the process of emotional contagion can occur when using technology mediated communication. The link between emotional contagion and group conflict and cooperation suggests that this may result in more consistent group performance given that positive contagion has been found to reduce conflict while negative contagion apparently increases conflict.

In general terms, there is a need for greater theoretical consideration of how emotional contagion is impacted by technological mediation and whether these impacts have positive, negative, or ambivalent implications for decision outcomes. Technological mediation may, for instance, prove to be particularly detrimental in decision contexts, such as the negotiation context noted previously, where emotions are highly salient.

Although some effort has been made to account for the impact of social norms on IS adoption decisions [e.g. 26], relatively limited attention has been given to the potential role played by emotional contagion. It might, for example, be important to understand the extent to which the willingness of members of a group or department to adopt a system is impacted by the emotional state of the group. At the level of the individual decision, it becomes important to develop a broader understanding of the specific emotions that are associated with increased willingness to adopt new technologies and those associated with increased reluctance. Although some work has begun to answer such questions [27, 28], further research is warranted in order to acquire of comprehensive understanding of the implications of emotions for technology adoption.

### 3.2 Anticipated emotions

Anticipated emotions are those emotions that one imagines one will feel as the result of a decision. It has been argued that expectation motivates almost all behavior [29] and considerable evidence suggests that decisions can be impacted by the emotions that a decision maker expects to feel. One approach to accounting for anticipated emotions has been to incorporate them into expected utility models of decision making [9, 30]. Expected utility models generally argue that decision makers assign value or utility to each decision outcome and then make the decision that maximizes the utility that they will receive. Under such models, anticipated emotions are characterized as additional outcomes to which utility values are assigned by the decision maker.

Although classic expected utility theory argues that decision makers will weight the utility of each outcome by the probability that it will occur, research suggests that they actually weight the utilities of each outcome according to their belief that each will occur [30]. In

addition, it has been found that decision makers are typically risk averse and therefore place higher utilities on losses than they do on equivalent gains [31]. Emotions play an important role in these risk assessments [30] which suggests that the influence of emotional context on decision making is at least somewhat related to anticipated emotions.

Positive emotions anticipated by a decision maker can fail to materialize for at least two reasons [32]. First, the outcomes associated with a decision may prove to be worse than the alternatives that were contemplated and second, resulting outcomes may prove to be worse than expected. The former possibility is important to regret theory [30] while the latter has been applied in the development of theories such as expectation-confirmation theory [33, 34]. Both perspectives are, however, considered useful in accounting for some of the explanatory difficulties associated with expected utility theory [30].

Considerable research attention has been directed toward understanding the impact of anticipated feelings of regret on decisions [30]. This research generally argues that decision makers incorporate assessments of any regret that may result following a decision into their utility assessments [32, 35]. Decision makers are thus seen as making decisions in a manner that minimizes expected future regret. Expectations of regret can be based on beliefs surrounding how others may judge a decision or on personal needs [35]. For instance, it has been reported that consumers will be more likely to buy a familiar product when, prior to making the purchase decision, they are asked to imagine purchasing an unfamiliar product and having it fail [36].

It is important to recognize that regret and risk aversion need not be related. Decision makers who are acting to avoid regret may act in either a risk averse or risk seeking manner depending on the feedback associated with a decision outcome [30]. A decision maker may, for example, opt for a risky option when expecting post-decision feedback on the value of that option and no such feedback on alternative options [32]. It is suggested that this tendency arises because decision makers hope to avoid the feeling of regret associated with learning that an option not selected yielded considerable value. Hence, anticipated emotions can result in decisions that are apparently contrary to long established theories of risk aversion [e.g. 31]. This highlights the potential importance of these emotions to research related to decisions and decision behavior.

Research related to anticipated emotions also highlights the need to separately consider the impact of each emotion on decision making. Even seemingly similar emotions such as regret and disappointment can uniquely impact the decision making process [16, 32]. Zeelenberg and Pieters [37] found, for example, that

disappointment generally led customers to complain while regret led them to switch service providers.

**3.2.1 Implications of anticipated emotions for IS theory.** Anticipated emotions clearly impact decision processes and recent research provides some indication that anticipated emotions are relevant to IS adoption decisions [38]. Given that users have been reported to express considerable frustration with the use of new technologies [39], expected frustration may be one important antecedent of these decisions. Perhaps the most apparent means for incorporating such emotions into IS adoption theory is by including expectations of frustration, disappointment, regret, and other relevant emotions into existing theories of expectation such as expectation disconfirmation theory [e.g. 34].

Anticipated emotions research does, however, highlight some challenges associated with direct incorporation of anticipated emotions into existing theories of adoption. The tendency to place higher utility on losses than on gains suggests, for instance, that individuals might perceive high risk situations as yielding disproportionately low benefits [5]. This tendency would thus seem to indicate that the relationship between IS adoption and anticipated emotions may not always be linear.

Decision makers have also been found to delay decisions in order to avoid regret [32] which helps to explain why apparently rational adoption decisions might not be made. It might also help to explain why individuals who claimed that they would adopt a technology within a specified period were less likely to exhibit behavior consistent with their stated intentions than those who claimed that they would not adopt the technology [40]. The importance of regret to this observation is supported by findings that concern for possible future regret is greater when the regret is associated with outcomes requiring explicit action on the part of the decision maker [30, 32].

Anticipated emotions research has found that it is possible to manipulate expected emotions. Hence, an important question in relation to IS adoption decisions is the extent to which theoretically relevant anticipated emotions can be manipulated to encourage IS adoption. The ethical implications of such research also serve to highlight the significant ethical considerations surrounding some emotions research.

In the context of the use of IS decision aids, the notion of anticipated emotions may be less relevant given that decision makers can discount anticipated negative feelings such as regret by blaming the technology for poor outcomes. Thus, it might be theoretically important to consider the extent to which anticipated emotions continue to impact decisions that are made using decision aids. Anticipated emotions research would appear to

indicate that the extent of this impact will vary with the extent to which the decision maker can assert that the decision aid was “responsible” for the decision. Since research demonstrates that decision making effectiveness is impacted by anticipated emotions, this possibility can have significant implications for the effectiveness of decisions that are made using decision aid technology.

### 3.3 Anticipatory emotions

An important distinction in research related to emotions and decision making is that made between emotions as cognitive input and emotions as direct antecedents of decisions [5]. Emotions that lead directly to decisions are referred to as anticipatory emotions and the existence of such emotions establishes a clear distinction between the impact of cognitions and the impact of emotions on decisions.

Mounting evidence suggests that emotions can lead directly to decisions and there is even some evidence that emotions might mediate the impact of certain cognitions on behavior [5]. Research has also found that the decision implied by decision makers’ emotions and that implied by cognitions can diverge and that when such divergence occurs, decisions are often more strongly determined by emotions than by cognitions [5]. Numerous studies have thus begun to explore the nature of anticipatory emotions and the role that they play in decisions. Negative anticipatory emotions have, for instance, been linked to delayed decisions [3] while a much larger stream of research is exploring the processes by which emotions lead to decisions.

The somatic marker hypothesis is among the more salient of theories positing emotion as a direct cause of decisions. This theory argues that the decision making process depends on emotional signals which provide decision makers with guidance, independent of cognitions, on the best course of action [41]. Research in this stream has found that “normal” individuals can make advantageous decisions prior to attaining cognitive understanding of a task while individuals with damage to key emotional centers in the brain do not make advantageous decisions even after attaining cognitive understanding [42]. This inability to make advantageous decisions can be observed despite these individuals possessing normal levels of cognitive intelligence [43]. Individuals with such damage have also been observed to make moral judgments uncharacteristic of “normal” individuals [44]. Although such findings would appear to indicate that emotions are necessary for effective decision making, some research has found that subjects with impaired emotional center functioning can perform better in circumstances where natural emotions must be inhibited to permit effective decision making [45].

However, in general terms these individuals exhibit poor decision making performance in comparison to “normal” individuals [5, 43].

There have been some reports that effective decision makers can recognize when emotions are relevant and incorporate them into their behavior [46]. These findings indicate that somatic markers may be related to the notion of emotional intelligence [43], defined as the “ability to read emotions in one’s self and in others, and to be able to use this information to guide decision-making” [4]. Support for this assertion is provided by reports that the previously discussed subjects with impaired emotional centers were also found to have reduced emotional intelligence scores [43]. Thus, the literature increasingly supports the notion that emotions can function as independent drivers of decisions and that, in some case, these emotions can lead to more effective decisions than those resulting from cognitive processes.

**3.3.1 Implications of anticipatory emotions for IS theory.** Emerging research demonstrating the existence and effectiveness of anticipatory emotions in relation to decision making serves to highlight the presence of a causal process underlying decision behavior that is distinct from cognitions. The existence of cognitions and anticipatory emotions as two distinct drivers of decision behavior provides some significant opportunities for IS theory development. These opportunities include the potential to increase the explanatory power of IS adoption theories that consider only cognitive drivers of adoption decisions or have posited that emotional factors are fully mediated through cognitions.

For example, although some research has posited emotions such as computer anxiety as antecedents to IS adoption decisions [e.g. 28], theoretical models typically posit the impact of these emotions as being mediated through cognitions such as perceived usefulness. In contrast, anticipatory emotions research suggests that while cognitions can drive behavior, it is also possible that emotions such as excitement and fear can drive information systems adoption without being mediated through cognitions. Since many of the behavioral models of adoption used in IS research are based on cognitively-oriented decision making theories like the Theory of Reasoned Action [5], adoption research could benefit significantly from extensions that incorporate consideration for direct emotional antecedents of behavior. Extensions of this kind might help researchers to account for the considerable unexplained variance in behavior that has been observed when existing models are tested [26].

The possibility that emotional and cognitive causal processes may be at odds offers theorists a potentially important explanation for conflicting results. It also suggests some challenges for researchers examining the

use and effectiveness of decision aid technologies. For example, anticipatory emotions research suggests that decision makers will make assessments using non-cognitive appraisal processes even when presented with the evaluations of credible experts [5]. Such suggestions have clear implications for research related to the use of decision aid technologies. Emotional decision processes within the decision maker may be at odds with the course of action suggested by supporting technologies. This may result in decision maker reluctance to accept a suggested decision, thereby impeding the effectiveness of these systems. In effect, emotions provide decision makers with a powerful, intrinsic mechanism for making decisions that they must override if they are to follow the prescriptions suggested by decision aid technologies. Research related to anticipatory emotions suggests that successfully overriding this mechanism is not an easy task.

#### 4. Conclusion

Emotions have been identified in the preceding discussion as playing three potentially important roles in IS theory development. First, they serve as important contextual factors surrounding the decision process. Second, anticipated emotions have been identified as impacting the likelihood that a particular decision will be made. Finally, the distinction between cognitive and emotional antecedents of decisions that is established by the existence of anticipatory emotions serves to highlight the potentially unique causal role of emotions in driving behavior. Although research attention to the impact of emotion on the outcomes of interest to IS researchers extends to the early years of the discipline [e.g. 47], the salience of emotions in a great deal of IS theory development has been relatively limited. The preceding discussion suggests, however, that emotions can be incorporated into IS theory in many ways that could significantly enhance the richness and explanatory power of these theories.

The discussion thus far has discounted the role of emotional consequents of behavior and it should therefore be noted that these outcomes remain significant to subsequent decisions through their impact on subsequent emotional context, anticipated emotions, and anticipatory emotions. For instance, prior experiences of frustration with the use of a new technology can be reasonably expected to result in anticipated frustration when a decision maker contemplates the adoption of technology in the future. Such considerations are clearly important to researchers attempting to provide process-oriented accounts of decision behaviors.

Calls are increasingly being made for a broader, more integrated perspective on the role of emotions in

organizations [4] and we suggest here that a similar need exists within IS research. This paper has argued that emotions are causally distinct from cognitions and, as a result, their incorporation into IS theory introduces an important dimension to theories within the discipline. There is, however, still much work to be done in understanding how emotions influence and are influenced by behavior [21]. This need, in conjunction with the prevalence of IS in organizations, suggests the need for IS researchers to work toward greater understanding of how emotions relate to the IT artifact and its proximal nomological network [48].

#### 5. References

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