12-31-1995

A Cognitive-Motivational Model of Group Member Decision Satisfaction

Murafi Venkatesh
Syracuse University

Ruth Small
Syracuse University

Richard Southwick
Syracuse University

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Murali Venkatesh
Ruth V. Small
Richard M. Southwick
School of Information Studies
Syracuse University

Abstract

A theoretic model of group member decision satisfaction based on a cognitive-motivational view of information-processing in inferential contexts is presented. Unlike normative-rational theorists, we acknowledge that information-processing is biased by the decision-maker's motivations which are assumed to derive from situation-specific goals. Information processing is assumed to be more extensive when judgmental accuracy is the salient goal and less extensive when other goals (e.g., self-esteem) are relatively more salient. The model analyzes the implications of this view for the relationship between confidence and satisfaction. Research propositions are advanced.

1. OVERVIEW OF PAPER

Group member satisfaction is a critical variable in groupwork assessments (Collins and Guetzkow 1964) and is assumed to influence decision implementation (Maier 1970). Influential definitions of group effectiveness include member satisfaction (Hackman 1990; Gladstein 1984). Unlike the user information satisfaction construct (UIS), which has received considerable research attention, group member satisfaction has suffered relative neglect: "research has done little to adequately define, explain, or measure (satisfaction) in a group context" (Keyton 1991, p. 200). Hecht (1978) urged researchers to develop group satisfaction measures "from a zero base" in view of the lack of theoretically-grounded instrumentation. Satisfaction assessments in GSS (computer-aided group support systems) have lacked theory (George et al. 1990). Theory here has a two-fold value: satisfaction is an important construct in itself and in the evaluation of other constructs (Smith, Kendall and Hulin 1969); satisfaction research has direct implications for the practice of groupwork.

Our focus is on member satisfaction with the group decision — a task outcome, and a key variable in group research (Collins and Guetzkow 1964). Uncertainty and information processing are critical, related features of decision-making (Berlyne 1960). Uncertainty — inherent in choice — motivates information processing which is "the primary instrumental means for uncertainty reduction" (Lanzetta 1968, p. 479). We consider the implications of this view for information processing, confidence, and satisfaction in a testable, cognitive-motivational model presented below. The model specifies the differential implications for information processing stemming from different cognitive motivations (embodying different levels of uncertainty), which derive from situation-specific goals, and uses the resulting biased information processing view to analyze the relationship between confidence and satisfaction. The model's front-end uses, and extends, Kruglanski's (1989) need for closure theory, while its back-end uses the belief-attitude causal link from expectancy-value theory to model the confidence-satisfaction relationship. We provide operational definitions of model constructs, discuss posited links between constructs, and advance propositions for GSS research.

Our model has direct relevance for GSS research. Examining the linkage between information processing and outcome variables is consistent with GSS research emphases. GSS designs are geared to support information processing and reduce uncertainty (DeSanctis and Gallupe 1987). The need for well-defined dependent variables in IS research has been emphasized (DeLone and McLean 1992), as has the need for theory in GSS (McGrath and Hollingshead 1993). Cognitive-motivational accounts of GSS phenomena have begun to appear in the literature (Ghani, Supnick and Rooney 1991).

The value of a motivationally-based (as opposed to a purely behavioral) view of information processing has been emphasized in individual (Corbin 1980) and group decision-making research (Guzzo 1986). A cognitive-motivational perspective allows the study of emotion in the GSS context (see DeSanctis 1993). Decision-making is fundamentally influenced by emotion as decision-makers "cope with (uncertainty-induced) anxiety and

build confidence" (Eisenhardt 1989, p. 572). Uncertainty is a critical motivational element in our model. To the extent that GSS are designed to support information processing and augment human rationality, the model predicts conditions under which information processing may be more or less extensive and decision-making more or less rational. Such a perspective provides a powerful, theoretic base to model the relationship between uncertainty, information processing, confidence, and satisfaction.

While GSS designs assume groups favor a rational perspective on decision-making (see DeSanctis 1993), recent research argues that equivocal decision-making conditions influence group attitudes toward GSS features (Poole and DeSanctis 1990), which in turn influence their use (see Sambamurthy and Chin 1994). Our model's cognitive-motivational base would predict such effects: to the extent that certain conditions (described as need to delay closure conditions below) heighten uncertainty and increase the extent of information processing, they may also positively influence perceived usefulness of relevant GSS features and, in turn, their use. Thus, the model can contribute to an adaptive view of GSS use, with motivations mediating GSS use.

While confidence and satisfaction are among key task-related outcomes in GSS, the lack of a theoretic consideration of these constructs is surprising (see Connolly 1993; George et al. 1990). The literature suggests a consistent positive correlation between these constructs. Conceptualizing confidence as a belief and satisfaction as an attitude allows this observed positive relationship to be modeled using the belief-attitude linkage from expectancy-value theory, thereby furthering theory development. This in turn allows the study of downstream behavior such as decision implementation in terms of belief-attitude-intention-behavior models (Ajzen 1985; Fishbein and Ajzen 1975), thus completing the causal chain. The value of such group research has been emphasized (Sniezek 1992).

This paper is organized thus: section 2 presents the model; section 3 positions the model in terms of the satisfaction literature; and section 4 concludes the paper by summarizing specific research testing the model.

2. A COGNITIVE-MOTIVATIONAL MODEL OF SATISFACTION

While Kruglanski's need for closure formulation provides the impetus, our model's theoretic base is broader and draws on the larger body of motivationally-based research in information processing (see Pyszczynski and Greenberg 1987). We start with a brief overview of the need for closure formulation and related research. We then define model constructs and describe and discuss posited relationships between constructs.

Closure, or cognitive closure, refers to "a sense of psychological completeness or certainty" (*Random House Dictionary of the English Language* 1987). The education literature has addressed the completeness component of the definition (e.g., Dubelle 1986), while certainty has been the focus in social psychology; the latter focus is adopted here as it offers a body of research on closure effects. Kruglanski advances a motivational theory of cognition in which need for closure is assumed to motivate people to prefer certainty over ambiguity. Need for closure represents a "quest for assured knowledge that affords predictability and a base for action" (Kruglanski 1989, p. 14). Closure, as an end-state, is characterized by certainty or confidence (Kruglanski and Freund 1983).

Closure indicates "closed-mindedness": *after* (versus *before*) making a confident decision, a decision-maker is relatively less receptive to new information on the topic (Kruglanski, Peri and Zakai 1991). However, information processing is seldom completely stopped (but may attenuate or be halted temporarily) even in the post-decision phase (Festinger 1964). Kruglanski conceptualizes need for closure as a situationally-induced drive, not as a psychological trait. Other cognitive-motivational research is fully consistent with this situational emphasis (see Pyszczynski and Greenberg 1987).

Information processing is influenced, or biased, by the decision-maker's motivations, which range from a high need to a low need for closure (Kruglanski 1989). The former refers to a need to expedite closure where a quick, definite response is desired, while low need for closure represents a desire to "keep an open mind" and delay closure before committing to a course of action. Kruglanski offers a cost-benefit explanation for the differential effects on information processing stemming from these motivations. When a decision is consequential and the cost of erroneous judgment high (e.g., a courtroom trial), a desire to avoid error and increase the likelihood of accuracy may prompt a juror to process information extensively before rendering a decision. In a mock trial, the same juror may be ready to process information less extensively and render a quick decision motivated by the perceived benefits of closure (the ability to pursue other alternative interests) over costs of lacking it (the need to invest time and effort in further information processing). It is assumed that goals other than accuracy are relatively more salient under need to expedite closure conditions.

Need to delay closure conditions suggest the following implications, based on Lanzetta (1968). An emphasis on judgmental accuracy (hereafter accuracy), or fear of invalidity with reference to a "correct" response (Kruglanski 1989), appears to increase uncertainty and the subjective value (hereafter value) placed on confidence; information processing tends to be more extensive as well as prompted by a desire to reduce uncertainty and increase confidence. Uncertainty, the value placed on confidence, and the extent of information processing are all

assumed to be relatively less under need to expedite closure conditions. In brief, the motivating properties of uncertainty are assumed to be stronger under need to delay closure conditions.

Only an individual who currently lacked closure but perceived it as beneficial should experience a need to expedite closure (Kruglanski 1989). It is assumed that, even under need to delay closure, an individual is motivated eventually to attain it. Critiques of rational or subjective expected utility approaches have argued against characterizing the decision-maker as endlessly vigilant (March and Simon 1963). Need for closure reflects a desire for "as complete, stable, or closed a state as circumstances permit" (English and English 1958, p. 57). Closure is generally desirable as it affords predictability and "because of its (psychological) coherence and unitary nature" (Kruglanski 1989, p. 15). Decision-avoidance motivations are differentiated from those where the decision-maker delays making a decision until she is confident enough to decide. Our model does not consider decision-avoidance motivations. Constructs in the model (Figure 1) are defined below.

Motivation. Two cognitive, or epistemic, motivations are considered in the model: need to expedite closure and need to delay closure. These motives, which derive from situation-specific goals stemming from task demands (extrinsic) and/or subjective (internal) criteria or standards, are assumed to bias the extent of information processing.

Information processing. Hypotheses, embodying possible states of the world are generated and validated en route to an inference (Kruglanski 1989). During validation (involving hypothesis testing), the plausibility of hypotheses is evaluated with reference to some criterion and a degree of confidence attached to available options. The process is assumed to continue until "some plausible hypothesis [is] advanced and supported by extant evidence" (Kruglanski 1989, p. 14). This view of information processing applies to a variety of inferential contexts including decision-making (Gettys et al. 1987). Information search and acquisition, cognition, and knowledge formation, all associated with hypothesis generation/validation, are subsumed under "information processing." Hereafter, extent of information processing refers to the number of hypotheses generated and how thoroughly they are validated in face-to-face group decision-making.

Confidence. Confidence — the converse of uncertainty in choice — is a key variable in decision-making (Sniezek 1992). As a belief, confidence is defined as a cognitive response and represents a probability assessment that the decision has some (valued) attribute(s) (Fishbein 1966). Our focus is on judgmental accuracy (hereafter accuracy) as an attribute of the decision; accuracy is an important objective in decision-making (Swann 1984) and may be synonymous with decision quality (Todd and Benbasat 1992). Certainty, confidence, and subjective probability are used synonymously (Howell and Burnet 1978). Hereafter, confidence refers to (self-reported) member confidence in the accuracy of the group decision (see Lanzetta 1963). Our model is relevant to decision-making tasks involving choice (McGrath 1984) where group members have some degree of uncertainty about the relative quality of choice alternatives (Lanzetta and Driscoll 1968).

Closure is defined as an (cognitive) end-state characterized by confidence and is assumed to result from confidence. It is assumed that information processing will attenuate after (versus before) a confident decision is made, signifying closure.

Satisfaction. As an attitude, satisfaction is defined as a function of a decision-maker's belief that the decision has some (valued) attribute(s) and the value placed on the attribute(s) (Ajzen 1989). The literature emphasizes the overall evaluative focus of an attitude, reflecting how favorable or unfavorable a person is toward an attitude object (Fishbein 1966) and is consistent with Melone's (1990) UIS characterization. Affect may be the central element of an attitude (Breckler and Wiggins 1989). Hereafter, satisfaction refers to (self-reported) member satisfaction with the group decision. Note that both confidence and satisfaction focus on member (i.e., member-level) responses to the group decision.

Each posited pairwise relationship in the model is discussed sequentially below. The propositions (Pn) apply to GSS settings.

2.1 Need for Closure and Information Processing

Kruglanski provides extensive evidence indicating that need for closure motivations bias the extent of information processing. Specifically, need to delay closure subjects initiated information-search with shorter latencies (Kruglanski, Peri and Zakai 1991), generated a larger number of hypotheses (Mayseless and Kruglanski 1987), were less prone to freeze on an early hypothesis and were more sensitive to subsequent information (Kruglanski and Freund 1983), and were more prone, during hypothesis validation, to adopt a diagnostic strategy (information search on alternative hypotheses) rather than a confirmatory strategy (information-search to confirm a presently held hypothesis). Overall, need to delay (versus expedite) closure subjects were less closed-minded. In these studies, need to expedite closure was experimentally induced by emphasizing quick, unambiguous decisions and low fear of invalidity, while accuracy and high fear of invalidity were highlighted to induce need to delay closure.

Other researchers have independently reported results consistent with those cited above. Lanzetta (1968) found information processing to be more extensive when accuracy was emphasized. Eisenhardt found that processing more information helped decision-makers reduce anxiety stemming from uncertainty and increase confidence in high-stakes decision-making. While they have been observed mostly with individuals, such effects appear to apply to groups as well (Newcomb, Turner and Converse 1965). Accordingly,

P1. Group members under need to delay (versus expedite) closure conditions will process information more extensively.

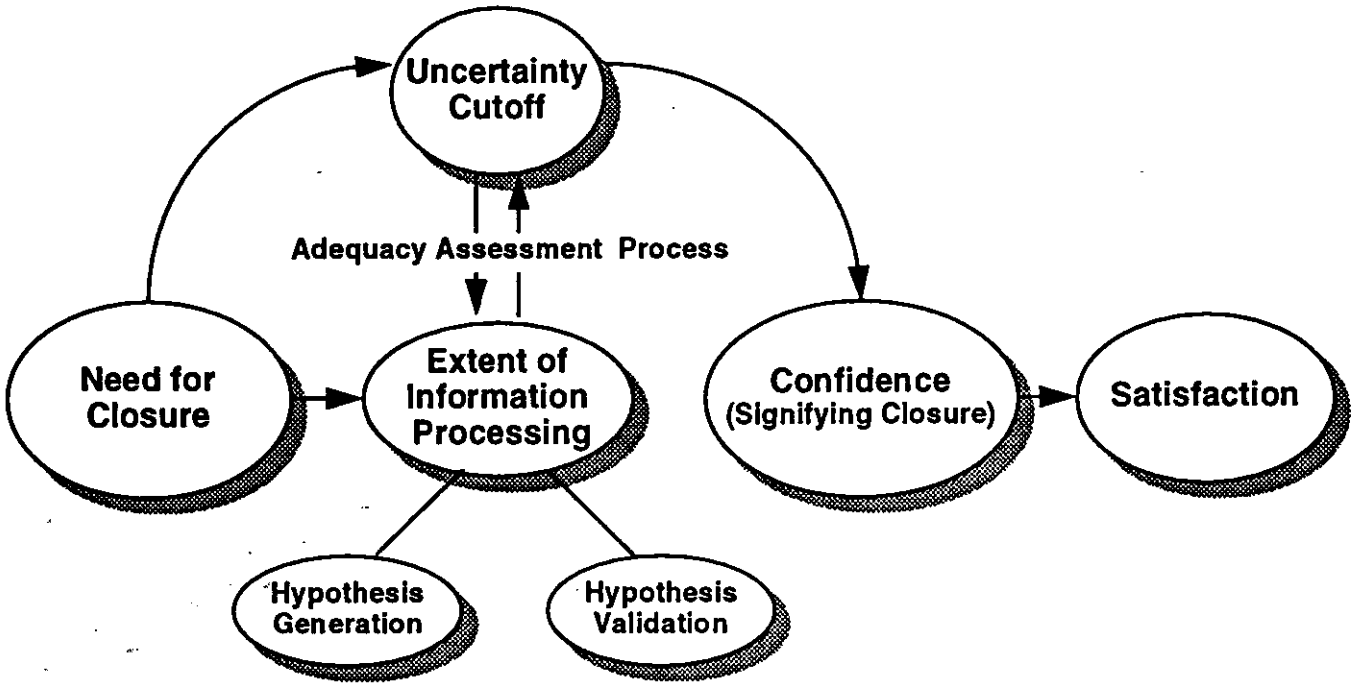

Figure 1. A Cognitive-Motivational Model of Group Member Decision Satisfaction

Need to delay closure should affect time-on-task. Validating a larger hypotheses-set should take longer. The stronger the accuracy motive, the more thorough hypothesis-testing will be (Pyszczynski and Greenberg 1987), resulting in delay. Uncertainty motivates delay, and expending more time-on-task is a means to decrease uncertainty and induce the readiness to decide (Corbin 1980); motivational factors' influence on confidence is discussed later. Therefore,

P2. Group members under need to delay (versus expedite) closure conditions will expend more time-on-task.

2.2 Information Processing, the Uncertainty Cutoff, and Confidence

The need for closure formulation assumes an adaptive decision-maker who actively assesses the adequacy of information processing in light of situation-specific goals; the observed effects of different motivations on the extent of information processing would be meaningless otherwise. However, a motivational perspective should spell out the "life cycle" of motives: the initiation, energization, and attenuation of the operative drive (Zedeck 1977). While it explains the first two in information processing terms, the need for closure formulation does not specify (1) the (subjective) standard of appraisal used by the decision-maker in assessing the adequacy of information processing, and (2) the motivation underlying the decision to halt information processing and make a decision (Corbin 1980).

Corbin's uncertainty cutoff is relevant to both issues. Information processing is undertaken to reduce uncertainty to an acceptable threshold or preferred confidence-level; choice may be delayed, and information processed, until this threshold or cutoff is reached. Lanzetta (1963) argues that "the probability of information processing should increase with increasing discrepancy between a preferred uncertainty level and the level of uncertainty induced by the choice task and should terminate when the preferred uncertainty level is reached" (p. 264). It thus appears that the extent of information processing, motivated by the need to reduce uncertainty and increase confidence, is regulated by the cutoff. Closure is attained when the cutoff is reached; at this point, information processing is halted and a decision made. Uncertainty may not cease to exist at the cutoff which only reflects an acceptable minimum confidence level. As the cutoff helps explain the motivation behind the decision to halt (versus continue) information processing, we reasoned that it would serve as the appraisal standard used by the decision-maker in assessing the adequacy of information processing. Figure 1 shows the reciprocal link between the cutoff and information processing.

But what constitutes an acceptable confidence level? With reference to what criterion does a decision-maker subjectively set the cutoff? The need for closure formulation does not specify such a criterion. As argued above, the uncertainty cutoff idea assumes an active, adaptive decision-maker. Information processing judged as inadequate under need to delay closure conditions may indeed be adequate under need to expedite closure conditions. Information processing is more extensive under the former condition arguably because the cutoff is set higher. In a study of individual decision-making, Lanzetta (1968) posited (and empirically confirmed) that the cutoff will be higher (i.e., less uncertainty tolerated) the more accuracy is emphasized. It thus appears that the cutoff may be set with reference to the need for closure (Figure 1) and is set higher under need to delay closure as such conditions tend to emphasize accuracy. From the above, it is assumed that the adequacy assessment process is conducted with reference to the cutoff.

Besides their effects on information processing, need for closure motivations influence a person's confidence in hypotheses. A paradoxical effect is that more information may result in reduced confidence. Due to the discounting tendency (Kelley 1971) a person who considers multiple competing hypotheses may have lower confidence than when fewer hypotheses are considered. As subjects under need to expedite closure conditions tend to consider fewer hypotheses, they would experience higher confidence; conversely, subjects under need to delay closure conditions would experience lower confidence (Mayseless and Kruglanski 1987). These studies, however, examined individual decision-making.

Group settings are different. Sniezek has called for more research on the link between information processing and confidence in group settings in light of the inconsistent results. Accordingly, the propositions below are in null form. Elements unique to group settings that impact confidence are grouped under motivational, information processing, and technology support factors.

Motivational factors. Confidence may be influenced by factors other than those relating to information processing; several motivational factors may play a role. Effort calculations, specifically effort minimization, are central to decision-making (Todd and Benbasat 1992). However, information processing is more effortful when accuracy is emphasized (Lanzetta 1968). Amount of time and effort expended on the task affect confidence, with evaluations being positive if people conclude they worked hard enough (Mayseless and Kruglanski 1987). Group members may be more confident about their group (versus their individual) decision to the extent that group products entail higher levels of time and effort (Sniezek 1992).

Information processing factors. Group interaction may increase member confidence in the group decision (Oskamp 1967). Others have argued that interaction, by surfacing divergent opinions and thereby increasing the amount of information processed by the group, may actually reduce member confidence (Sniezek 1992).

Interventions emphasizing consensus appear to increase confidence; conversely, member disagreement may reduce confidence. Kruglanski and Webster (1991) suggest that when information processing is cognitively taxing (e.g., under conditions of ambient noise), members may feel motivated to reach consensus so as to be free of the need for further processing. This explanation is consistent with findings that reduced information processing increases confidence (Sniezek 1992). Kruglanski and Webster provide a theoretic perspective on the consensus-confidence link by equating the drive for consensus with the need for collective closure.

The decision strategy adopted may impact confidence. Eisenhardt reports that time-efficient simultaneous consideration of multiple alternatives, versus sequential consideration of fewer alternatives, helped bolster confidence that "no stone was left unturned" en route to a decision in high-velocity, high-stakes environments. Zakay (1985) found that confidence was higher after non-compensatory (versus compensatory) decisions. He offers an information processing explanation for this finding: non-compensatory decision processes may boost confidence "since only attributes which support the feeling of confidence are included in the chosen alternative" (p. 79). Adopting a confirmatory (versus diagnostic) strategy during hypothesis validation may result in increased confidence for similar reasons.

Technology support factors. Pinnsonneault and Kraemer (1989) distinguish group communications support systems or GCSS (systems that support information capture, exchange, and display) from group decision support systems or GDSS (systems that provide decision modeling and analytic support aimed at reducing uncertainty). Reviewing the literature using this typology, the authors found GDSS use enhances confidence and satisfaction, while GCSS use actually lowers both. They attribute these effects at least partly to GDSS-provided task-performance support.

This distinction between support functions is useful, and suggests that GSS design must take into account task demands (DeSanctis and Gallupe 1987). To the extent that GSS use (versus no GSS use) fosters idea generation (Benbasat and Nault 1990), information overload may be a problem unless aids are provided to marshal and integrate information (Broome and Chen 1992). Task difficulty has been defined in information load terms as well, with greater load associated with high-difficulty tasks. Gallupe, DeSanctis and Dickson (1988) suggest that choice-induced post-decision apprehension may have been exacerbated by the more extensive information processing observed in GSS (versus non-GSS) groups, resulting in reduced confidence. Information overload may be a "serious and continuing potential problem" with GSS (McGrath and Hollingshead 1993, p. 87). GSS

computational and analytic aids may be more valuable under information-overload conditions (see Rao and Jarvenpaa 1991).

Weick and Meader (1993) argue the need for "triangulation" support in GSS to foster shared group understanding. Information-overload is a threat to triangulation. GSS support for the integration of divergent viewpoints and consensus formation facilitates higher confidence and satisfaction (Sambamurthy and DeSanctis 1990). Hypothesis validation in a group setting may entail cognitive or mixed-motive conflict resolution if members disagree on evaluating options (DeSanctis and Gallupe 1987). GSS support for validation could include aids for information integration and consensus formation (Sambamurthy and Chin 1994) and/or analytic aids that help decompose judgments for resolving conflict (Steeb and Johnston 1981). Both consensus formation and judgment decomposition appear to increase confidence. In terms of our model, the literature suggests the need to complement GSS hypothesis generation support with hypothesis validation support. The latter may be especially indicated under need to delay closure conditions given P1.

To the extent that the uncertainty-cutoff is set with reference to the need for closure, it should be set higher under need to delay closure, resulting in higher confidence. Although this may be true of individual decision-making (Lanzetta 1963), its application to groups is considerably more complicated. Certain aspects of the group setting (consensus) may increase confidence, while others (member interaction) may reduce it. Under need to delay closure conditions, the negative impact on confidence stemming from information overload may neutralize increased confidence stemming from the time and effort expended in validating a large number of hypotheses. As clear cut results on the effects of information processing on confidence are unavailable (Sniezek 1992), P4 must be stated in null form:

P3. Confidence levels under need to delay, versus expedite, closure conditions will not be significantly different.

GSS support for hypotheses generation and validation should help increase confidence under need to delay closure conditions by helping groups deal better with information overload, by aiding conflict resolution and consensus formation, and by improving accuracy via analytic aids. Need to delay closure conditions emphasize accuracy; interventions that facilitate accuracy also increase confidence (Sniezek 1992). However, as group research has generally neglected motivation (Guzzo 1986), the interaction effects of cognitive motivations and technology support on confidence are unknown. Therefore, P4 must be stated in null form and applies to both need for closure conditions.

P4. Confidence levels when both hypotheses generation and validation are supported, versus hypothesis generation support alone, will not be significantly different.

2.3 Confidence and Satisfaction

The need for closure formulation does not address satisfaction; we extend it to include satisfaction. To the extent that closure is a desirable end-state resulting from confidence, we reasoned that its attainment would be satisfying and that confidence would be a predictor of satisfaction. Under conditions that highlight the benefits of expedited closure, attaining closure quickly should be satisfying. Conversely, conditions emphasizing accuracy also tend to highlight the benefits of keeping options open. Under such conditions, delayed closure should be seen as desirable and, when attained, satisfying. The value placed on confidence should also be higher, and confidence a stronger predictor of satisfaction, under such conditions. We discuss the posited confidence-satisfaction relationship based on supportive indications in the literature and on expectancy-value theory.

The positive relationship between confidence and satisfaction has been widely noted. For example, Sniezek argues that "it seems odd to imagine that a group whose confidence is low (relative to a meaningful criterion) could be satisfied with its decision" (1992, p. 130). The numerous references in the literature to uncertainty as an aversive element in decision-making (Corbin 1980) suggest negative implications for satisfaction from uncertainty. In the GSS literature, confidence and satisfaction are consistently positively correlated (e.g., Pinnsonneault and Kraemer 1989). However, the two constructs are conceptually distinct: Sniezek notes that confidence is a belief, while satisfaction is an attitude.

The posited direction of the confidence — satisfaction link in the model is consistent with arguments in the literature. Expectancy-value theory has been used to model the belief-attitude causal link in the context of satisfaction (Oliver 1980). Per expectancy-value theory, salient beliefs have a ***causal*** effect on attitudes (Ajzen 1989). Indeed, the belief-attitude causal link is a well established central tenet of expectancy-value theory (Pratkanis 1989) and is explicit in definitions exemplified by Fishbein: "a person's attitude toward any object can be seen as a function of his beliefs about the object, and the evaluative aspects of those beliefs" (1966, p. 205). Other, related conceptualizations of satisfaction posit a similar directional relationship. For example, Collins and Guetzkow model satisfaction — defined as "a judgment of a subjective state of feeling or evaluation" (1964, p. 189) — as an evaluative response to some type of cognitive appraisal (e.g., group task success).

In decision-making, the need for accuracy is one of many possible motivations, although a very important one (Swann 1984). The value placed on accuracy is assumed to vary situationally. Sometimes it is extremely important to arrive at an accurate decision (e.g., a courtroom trial), while at others (a mock trial) accuracy may be less salient relative to other goals. Accordingly, the value placed on confidence in the accuracy of the decision is also assumed to vary situationally. To the extent that need to

delay closure conditions emphasize accuracy, they would also tend to emphasize confidence. Uncertainty would be tolerated less under such conditions. To the extent that goals other than accuracy are relatively more salient under need to expedite closure conditions, the value placed on confidence in the accuracy of the decision should also be correspondingly lower relative to that placed on other, presumably more salient outcomes (such as, "Did I make the right impression on the boss?").

However, accuracy is seldom ignored even when other goals are relatively more salient (Pyszczynski and Greenberg 1987). As such, confidence should be a significant predictor of satisfaction under both need for closure conditions. Therefore

P5. Confidence will be a significant predictor of satisfaction.

Given that an attitude is a function of ***salient*** beliefs (Ajzen 1989), the strength of the confidence-satisfaction causal link should vary depending on the salience of the former. To the extent that conditions emphasizing accuracy also emphasize confidence, confidence should be a stronger predictor of satisfaction under such conditions. In theoretic terms, an attribute's value "contributes to the attitude in direct proportion to the strength of the belief that the object has the attribute in question" (Ajzen 1989, p. 247). Therefore,

P6. Confidence will be a stronger predictor of satisfaction under need to delay (versus expedite) closure conditions.

Feather (1982) suggests that attaining a highly valued goal should result in more positive affect than attaining a goal with relatively lower value. While this suggests, for example, that under need to delay closure conditions the rendering of an accurate decision would result in higher satisfaction relative to the attainment of some other, less salient goal for that decision-maker, it does not imply that the decision-maker would be any more satisfied relative to another decision-maker who desired, and attained, a goal that is salient for her. If, for example, a decision-maker values decisiveness, attaining this goal should contribute significantly to her satisfaction. Under such circumstances, rendering an accurate decision would not necessarily lead to higher satisfaction (Collins and Guetzkow 1964). Therefore, P7 predicts no significant difference in satisfaction levels:

P7. Satisfaction levels under need to delay, versus expedite, closure conditions will not be significantly different.

3. POSITIONING THE MODEL

In this section, we position our model within the satisfaction literature. We start with the influential expectancy-value theory, and focus on the theory's coverage of the two critical, related features of decision-making discussed earlier: uncertainty and information processing.

A review of the substantial literature on expectancy-value theory — also known as valence-instrumentality-expectancy, expectancy-valence (Feather 1982) — is beyond the scope of this paper. The theory's basic tenet is that an individual chooses to perform certain acts on the basis of the strength of an expectancy (or expectation) that the act will be followed by a given outcome and on the value or attractiveness of that outcome (Vroom 1964). Expectations are assumed to create a frame of reference about which one makes a comparative judgment. Discrepant outcomes poorer than expected (negative confirmation) are evaluated below this reference point, whereas those better than expected (positive confirmation) are evaluated above its base (Oliver 1980). Outcomes in a valued (versus disvalued) direction are evaluated more positively (Locke 1976). Prototypical approaches that predate expectancy-value theory have been used to study group member satisfaction (Thibaut and Kelley 1959).

Expectancy-value theory centers on uncertainty (Beach and Beach 1982) as it is concerned with conscious judgments of subjective probabilities associated with alternative outcomes. However, it assumes that the only important information processing involved in decision-making is limited to the comparison of the expected values of alternative courses of action and neglects important pre-decisional processes such as hypothesis generation and information search (Mann and Janis 1982). As such, the theory leaves unspecified the important motivational link between uncertainty and pre-decisional information processing. Decision-making research cannot ignore the process of "alerting, exploring, and analyzing" that precede choice and form the basis of choice itself (Simon 1959, p. 272). As it ignores the process view, expectancy-value theory has been described as "a model of choice (based upon a prescriptive or normative rule) rather than a comprehensive descriptive theory of decision-making" (Mann and Janis 1982, p. 348).

Although described as a cognitive-motivational theory (Feather 1982), expectancy-value theory does not specify the conditions under which information processing may be more or less extensive (Mann and Janis 1982). The theory assumes a hyper-rational decision-maker. The decision-maker is assumed to be a vigilant information processor motivated to maximize subjective expected utilities in the choice situation; all choice alternatives are assumed to be given and their consequences known. This is unrealistic in the light of bounded rationality assumptions (March and Simon 1963) and provides no theoretic account of adaptive information processing strategies that may diverge from rational-utilitarian assumptions; under such conditions, the theory may be less appropriate (Feather 1982). As the theory does not provide for such contingencies, the implications of less-than-rational information processing strategies for confidence and satisfaction are not considered.

Per Weick (1969), understandable situations that facilitate prediction are satisfying; as such, equivocality-reduction is

assumed to yield satisfaction. There are several problems with this approach. First, Weick appears to assume a monotonic link between equivocality-reduction and satisfaction: the less the equivocality, the greater the satisfaction. This assumption is mechanistic and cannot explain situations where ambiguity may be reduced to such low levels as to negatively affect satisfaction (Abualsamh, Carlin and McDaniel 1990). That is, some level of ambiguity may actually be desirable under certain conditions (Kruglanski 1989). Second, while "knowledge" as a basis of prediction and control is posited to reduce equivocality, Weick does not describe how different levels of equivocality bias knowledge-acquisition and utilization. Third, Weick's approach lacks the specificity required of a testable model.

Goal-setting theory reports a positive correlation between goal attainment and satisfaction (Latham and Locke 1991), but does not explicitly consider information processing or the effects of underlying motivations on cognition. Both goal-setting and equivocality-reduction are broadly consistent with expectancy-value theory. Other conceptualizations, such as need gratification (Wolf 1970) and constraint-reinforcement theories (Shelly 1972), and the two-factor theory of Herzberg, Mausner and Snyderman (1959) either focus on job satisfaction exclusively or provide no theoretic perspective on uncertainty and information processing and are therefore less useful in decision-making settings. Furthermore, none of these conceptualizations has been applied to groups.

The term *closure* has been used in group research to denote a desirable cognitive end-point. Van de Ven and Delbecq (1974) found that NGT groups attained closure relative to delphi and interacting groups and were also more satisfied. This suggests a positive link between closure and satisfaction. Hagen and Burch (1985) found that member perception of task closure was positively related to satisfaction. Eisenhardt identifies confidence and anxiety (stemming from uncertainty) as "key factors influencing the pace of decision closure" (1989, p. 573). Lack of closure may characterize unproductive meetings (Bostrom, Anson and Clawson 1993). While closure appears consistently to have positive connotations and lack of closure negative connotations, the term is not defined adequately or explicitly in the group literature.

Our model addresses these lacunae. First, it is descriptive and process-focused not normative, and specifically covers the relationship between uncertainty and pre-decision information processing. The life cycle of cognitive motives is described with respect to the initiation, energization, and attenuation of information processing, with the uncertainty cutoff denoting a logical halting point. Second, using a cognitive-motivational view, we assume that the decision-maker is more or less rational and information processing more or less extensive in light of salient goals. Unlike expectancy-value theory, our model specifies the differential implications for information processing stemming from different motivations and uses the resulting biased information processing view to analyze the relationship between confidence and satisfaction.

Third, unlike the equivocality-reduction approach, our model explicitly covers conditions where judgmental noncommitment is valued (need to delay closure conditions). Delaying closure (i.e., living with uncertainty) may be entirely satisfying under such conditions. Fourth, consistent with the literature, we define closure as resulting from confidence and advance a testable model of satisfaction with confidence as an antecedent. Our model provides a situation-specific perspective on satisfaction (Heslin and Dunphy 1964) and describes conditions under which the strength of the confidence-satisfaction relationship will vary, thereby helping improve understanding of the components of satisfaction. Nonetheless, our model builds on prior theories. The belief-attitude link from expectancy-value theory is used to model the confidence-satisfaction link; defining satisfaction as an attitude brings it in line with the UIS construct. Need for closure motivations may be functionally similar to expectation-type standards and may be a positive analog of equivocality-reduction motives. Our model is broadly consistent with goal-setting explanations of satisfaction as well.

We have presented but the outlines of a closure theory of satisfaction. As a first description, the model has several limitations. Satisfaction is a complex, multi-dimensional construct (Cummings, O'Connell and Huber 1976); we only consider decision satisfaction. However, the model would suggest that determinants of process satisfaction, another widely studied variable, will vary situationally as well: structured processes that emphasize deliberation and analysis may be evaluated more positively when accuracy is emphasized. We only consider conditions under which information processing is more or less extensive. When the emphasis on accuracy is extremely low or extremely high, information processing may cease altogether from overconfidence or panic respectively (Mann and Janis 1982). We do not consider such extreme conditions.

4. RESEARCH DIRECTIONS

Specific research projects based on the model are briefly discussed in this section. Two laboratory experimental studies (one a pilot) testing parts of the model have been completed. Both studies involved groups (with three students per group) who used a GSS (VisionQuest) at the Interface Research Laboratory at Syracuse University. Need to delay closure groups were informed that their prioritized solutions to the stimulus problem (a business case) would be evaluated specifically for quality (accuracy) by a panel of professionals (high fear of invalidity), while need to expedite closure groups were informed that their prioritized solutions would be reviewed but specifically not evaluated for quality (low fear of invalidity). These operationalizations are based on Kruglanski and Freund (1983).

Results from the pilot provide generally supportive ***correlational*** evidence; confidence and satisfaction (both self-reported) were significantly correlated under both need for closure conditions, but the correlation was considerably stronger under need to delay closure conditions. Data from the follow-up study are currently being analyzed to assess the predicted ***causal linkages*** in the model.

Both studies used a version of a group member satisfaction instrument (Venkatesh, Small and Verville 1993) based on the model which had been validated in two pilot field administrations in business settings. The instrument is currently being refined for further field testing. The authors are exploring the model's implications in two other contexts besides managerial decision-making: learner satisfaction in education and user perceptions in computer-based information retrieval environments.

It is interesting to speculate on the interaction effects of need to delay closure and GSS support on the confidence-satisfaction relationship. Proposition 1 states that need to delay closure conditions will be characterized by more extensive information processing. To the extent that information overload is an issue in GSS, it is possible that the combination of need to delay closure motivations and GSS support (versus no GSS support) could give rise to an "information effect" on confidence. While need to delay closure motivations would tend to increase the value placed on confidence (due to fear of invalidity pressures), GSS support would tend to increase the amount of information available for processing and thus impact, positively or negatively, a group member's confidence. In either case, the salience of confidence should increase resulting in a much stronger relationship between confidence and satisfaction (compared with need to delay closure motivations and GSS support operating not in combination but separately). A large scale experimental study using a factorial design crossing GSS support versus no GSS support with need to expedite versus delay closure motivations is under consideration by the authors to investigate such effects.

5. ACKNOWLEDGMENTS

We would like to thank the anonymous reviewers for comments and suggestions on an earlier version of this paper.

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