

## AN EXPLORATION OF TWO COMPETING PERSPECTIVES ON INFORMATIONAL CONTEXTS IN TOP MANAGEMENT STRATEGIC ISSUE INTERPRETATION\*

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### ABSTRACT

Two disparate theoretical views of how informational contexts affect managerial sensemaking and decision making appear in organizational research. An organizational information processing perspective posits that increasing the flow of information within and between organizations will enhance environmental awareness. In contrast, behavioural decision making and social cognition research suggest that information may increase the occurrence or magnitude of overconfidence and illusions of control. These competing predictions were examined by means of an investigation of the relationship between informational contexts and top managers' strategic issue interpretation. Findings indicate that managers whose organizations have environmental information readily available to them perceive higher control over issues than managers in organizations with lower informational availability. Moreover, managers in top management teams with higher information processing capacity seem to perceive higher degrees of control and manageability, and search for less data in issue interpretation, than managers in teams with lower information processing capacity. These results offer some support for the behavioural decision making and social cognition perspective, and question the organizational information processing prediction that organizations engaging in active information processing are more aware of the environment and more likely to assess environmental developments, trends or events in a more vigilant manner.

### INTRODUCTION

Organizations are consumers, managers, and purveyors of information (Feldman and March, 1981), and management practitioners and researchers have long been interested in how acquisition and processing of information affect managerial sensemaking and decision making. Finding ourselves in an 'information revolution age' where the Internet and executive information systems make almost unimaginable amounts of different types of information available to managers, effects

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of informational contexts should be important to both management theory and practice.

Most research in behavioural or descriptive individual and organizational information processing rests on the observation that managers, as well as other individuals, are limited in their capacity to process information (Simon, 1955). Such inherent limitations may result in maladaptive sensemaking in general, and low environmental awareness in particular (Starbuck and Milliken, 1988b). Yet, two disparate research traditions that address the effects of information on decision making offer contrasting views on how individuals and organizations should cope with such limitations in managerial information processing capability. Within an organizational information perspective, the prescription has been to increase the flow of information within and between organizations through, for instance, organizational scanning, boundary spanning and high capacity information processing structures (e.g. Gannon et al., 1992; Thomas and McDaniel, 1990). Whereas this perspective usually acknowledges the possibility of information overload and accepts that more information is not necessarily better (e.g. O'Reilly, 1980), it emphasizes how organizational information activities can enhance environmental awareness by updating managers' knowledge of the environment and providing early input for noticing and interpretation (e.g. Daft and Weick, 1984; Dutton, 1993a; Huber, 1990; Huber and Daft, 1987).

Behavioural decision making and social cognition research, on the other hand, have dealt with a number of potentially dysfunctional effects of information (e.g. Fiske and Taylor, 1991; Hogarth, 1987; Tversky and Kahneman, 1974). In particular, research on positive illusions has shown that information may increase the occurrence or magnitude of overconfidence and illusions of control (e.g. Davis et al., 1994; Langer, 1983; Oskamp, 1965). However, most empirical research on the relationship between information and positive illusions has been carried out in laboratory settings. Thus, neither the organizational context within which individual level information processing takes place, nor the fact that organizations are strategic information processing systems encompassing information processing activities on both the individual and organizational levels (Calori et al., 1994), have been considered in this line of research. Schwenk (1986) developed a conceptual model describing how information may create overconfidence and control illusions among executives, but little empirical evidence exists on the degree to which this issue is relevant among top managers engaging in strategic issue interpretation or other forms of sensemaking.

Despite the observation that executives are far from immune to positive illusions or exaggerated confidence (e.g. Bazerman and Hoffman, 1999; Hayward and Hambrick, 1997; Kahneman and Lovallo, 1993; Pfeffer, 1981; Salancik and Meindl, 1984; Schwenk, 1986), organizational information processing research has usually ignored this particular potentially dysfunctional effect of information. Moreover, organizational information processing studies focusing on the effects of information have often translated informational contexts directly to output like organizational response or financial performance (e.g. Dollinger, 1984; Gannon et al., 1992; Jennings and Lumpkin, 1989; Reid, 1984; Smith et al., 1991), without analysing the effects on evaluations and judgments of top managers within the organization.

The purpose of this study was to contribute to research on organizational information processing by adopting a cross-level analysis of how informational contexts

at the group and organization levels are related to individual top managers' perceptions in the context of ill-structured strategic issues. Drawing on organizational information processing literature and research on positive illusions, I will develop competing hypotheses on how organizational level information availability and the information processing structure used by the organization's top management team are related to top managers' perceptions of control and manageability and their data search behaviour.

#### THEORETICAL FRAMEWORK AND HYPOTHESES

Strategic issues refer to emerging developments, trends or events which in the judgment of some strategic decision makers is likely to have the potential to affect organizational performance (Ansoff, 1980; Dutton et al., 1983). These issues involve matters other than tactical or operational concerns and usually concern whole organizations and their goals (Dutton, 1986; Ginsberg, 1988). The potential impact of strategic issues is uncertain (Mintzberg et al., 1976), which make strategic issues ill-structured and ambiguous (Lyles, 1981), and open to multiple interpretations (Daft and Weick, 1984).

The impact that issues may have on organizations depends on how they are interpreted (Ginsberg and Venkatraman, 1992; Thomas and McDaniel, 1990; Thomas et al., 1993). Following previous research, issue interpretation is conceptualized in terms of perceived controllability (Jackson and Dutton, 1988), manageability (Ginsberg and Venkatraman, 1995), and data search associated with issues (Thomas and McDaniel, 1990). Perceptions of controllability and manageability are seen as indicative of optimistic and positively valenced interpretations of issues (e.g. Ginsberg and Venkatraman, 1995; Jackson and Dutton, 1988) signalling confidence in the organization's capability to deal with an issue (Dutton, 1993b). Data search, in terms of the amount and types of data managers gather and use in issue interpretation, is supposed to reflect top managers' recognition that there is more to be learned about an issue and a need to engage in more vigilant sensemaking in order to further clarify and better understand issues (Thomas and McDaniel, 1990).

##### *Informational Contexts and Issue Interpretation*

Informational context is broadly defined as relatively stable organizational factors related to flows of information occurring in and around organizations (Knight and McDaniel, 1979). Such factors may be conceptually linked to managerial issue interpretation and decision-making through their filtering and distributive mechanisms. In essence, informational contexts influence the amounts and types of data and information to be used by individual top managers engaged in issue interpretation (Huber and Daft, 1987). In the present study, two informational contextual factors are investigated: organizational level information availability and the information processing capacity of the organization's top management team.

##### *Organizational Information Availability*

Organizational information availability refers to how readily available different types of environmental information are to top managers in the organization. As defined here, information availability may be seen as resulting from the organiza-

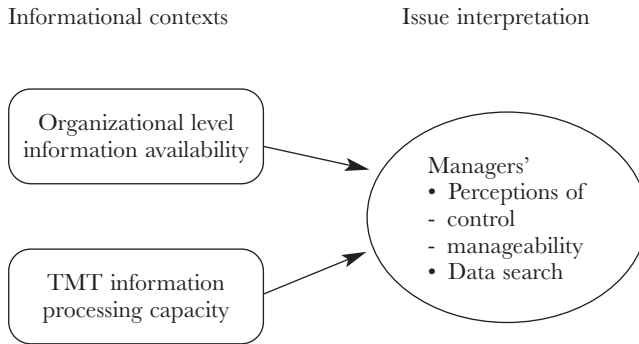


Figure 1. Conceptual framework

tion level activities regarding formal and deliberate efforts of viewing or monitoring the environment (e.g. Aguilar, 1967; Auster and Choo, 1994). In order to keep an organization in touch with the environment, it must be designed to ensure that decision makers receive information in an amount and form that facilitates effective interpretation and decision making (Daft et al., 1993). Organizations may even attain a strategic information advantage or disadvantage depending on the availability of information (Hambrick, 1982). For instance, high information availability may help managers broaden their outlook, challenge their preconceptions and provide them with more insight into their business environment (e.g. Vandenbosch and Huff, 1997). Accordingly, descriptive as well as normative organizational information processing literature stresses the importance of organizational information acquisition and availability (e.g. Daft and Weick, 1984; Stoffels, 1994).

An important function of organizational information processing activities is to provide the amount and type of information needed to reduce managers' perception of uncertainty (Daft et al., 1988; Huber and Daft, 1987). Empirical investigations suggest that managers who have large amounts of information available, and make use of this information, are better able to cope with ambiguity (Eisenhardt and Bourgeois, 1988) and uncertainty (Milliken, 1990). Thus, an organizational information processing perspective may suggest that managers in information intensive organizations, exposed to more information to be used to exploit opportunities and to effectively cope with threats (Dutton, 1993b) will sense higher degrees of control and manageability in issue interpretation. Why information may have such an uncertainty-reducing effect is not clear. In classic information theory (e.g. Galbraith, 1977; Gifford et al., 1979; Schmidt and Cummings, 1976), also known as the logistical perspective of information processing (Sutcliffe, 2001), high controllability and manageability perceptions would be explained by the assumption that managers have obtained sufficient knowledge and understanding of issues. These scholars defined uncertainty as the difference between the amount of information required to perform a task and the information already possessed by the organization.

Such a mechanistic view of the effects of information may hold for simple or structured tasks or problems, or under stable environmental conditions. However, in the context of ill-structured strategic issues, low perceived uncertainty probably reflects an oversimplification of 'real' or 'objective' uncertainty (Bourgeois, 1985)

that may be due to *lack* of information or knowledge. Thus, in more recent organizational information processing literature (e.g. Huber, 1991) it is usually suggested that managers in information intensive organizations will go beyond surface characteristics in issue interpretation and be more sensitive to the uncertainty and complexity of environmental developments, trends or events. First, managers who have large amounts of information available will have more raw material for constructing their interpretations (Knight and McDaniel, 1979). Second, managers in information intensive organizations may have more factual knowledge and a better understanding of the environment (Goldstein and Zack, 1989) and be more accurate in their perceptions due to the breadth and variety of informational input (Sutcliffe, 1994). Accordingly, high levels of information availability may produce enough information for top managers to realize the limitations of their organization's ability to control and manage ill-structured strategic issues.

Studies of the relationship between exposure or availability and use of data strongly suggest that managers in information intensive organizations would search for more data in issue interpretation (e.g. Culnan, 1983, 1984; Goldstein and Zack, 1989; O'Reilly, 1982). Managers in such organizations may also have more detailed and meaningful knowledge structures (Goldstein and Zack, 1989), attend to more signals, have better appreciation for the value of information (Cooper et al., 1995; Karlins and Lamm, 1967), and better understand what they do not know (McGee et al., 1995). In summary, these arguments suggest that organizational information availability will enhance vigilant issue interpretation. Thus, according to an organizational information processing perspective:

*Hypothesis 1a:* The level of organizational information availability will be negatively related to top managers' control and manageability perceptions and positively related to data search.

From the perspective of behavioural decision making and social cognition, it may be argued that information availability may increase managers' perception of control and manageability simply by their knowing that information is available or that information acquisition is being taken care of and institutionalized. First, investigations of psychological diagnosis (Oskamp, 1965), consumer decisions (Jacoby et al., 1974a, 1974b; Van Raaij, 1988), financial decisions (Davis et al., 1994; Dreman, 1979), and investment decisions made by venture capitalists (Zacharakis and Sheperd, 2001) have demonstrated that people often feel more confident and less uncertain about a decision or a judgment when they have more information available. Second, information may enhance perceived competence and inspire confidence in the organizations ability to deal with issues. Information in itself symbolizes rationality and competence and may create a belief among managers that an organization with more information is better than one with less (Feldman and March, 1981; Langley, 1989). Similar to the phenomenon referred to as the illusion of control (Langer, 1975; Salancik and Meindl, 1984; Schwenk, 1986), such general confidence in an organization may lead managers to overestimate the organization's skills in dealing with issues and the impact the organization has on uncertain environmental events. Moreover, the effort put into organizational information activities may result in a feeling of 'no stone was left unturned' (Eisenhardt, 1989) or that necessary information is always available if needed. Thus, even without using or analysing the information provided by the

organization's information activities, availability of information may have symbolic and ritualistic functions to the effect that managers get a sense of mastery and control, and thereby view issues as more controllable and manageable. If information availability has such a comforting effect on managers, they will less likely engage in vigilant information processing behaviour and therefore search for less data in understanding issues. Thus, according to behavioural decision making and social cognition research:

*Hypothesis 1b:* The level of organizational information availability will be positively related to top managers' control and manageability perceptions and negatively related to data search.

#### *The Information Processing Capacity of Top Management Teams*

While information availability refers to the availability of environmental input at the organizational level, the information processing capacity of top management teams deals more directly with face to face intra-organizational distribution, sharing and processing of information. Information processing capacity of the top management team is defined as the rules, procedures and patterns of interaction and participation that characterize the top management team when it addresses strategic issues (Duncan, 1973; Thomas and McDaniel, 1990). The notion of information processing *capacity* relates to findings indicating that high levels of participation, interaction and flexibility facilitate teams' capacity to process information (Duncan, 1973, 1974; Galbraith, 1973) and thus foster the use of information in strategic issue diagnosis (e.g. Daft and Lengel, 1986; Thomas and McDaniel, 1990). Thus, the information processing capacity of top management teams was operationally defined using the structural characteristics of participation, interaction and flexibility.

In accordance with an organizational information processing perspective, positive relationships between high information processing capacity and perceived environmental uncertainty have been found (Duncan, 1973; Leifer and Huber, 1977). Low information capacity, on the other hand, tends to buffer and simplify 'real' uncertainty due to limited flows of information (Leifer and Huber, 1977). Moreover, high information processing capacity may lead to more differentiated belief structures within teams (Dutton and Duncan, 1987), greater exchange of ideas and more careful deliberation of issues (Milliken, 1990). Accordingly, teams with high information processing capacity might be characterized by more active or mindful information processing which reduces the possibility of cognitive simplifications (Louis and Sutton, 1991) like overly optimistic interpretation. Such vigilant information behaviour might explain findings indicating that structural characteristics like participation, interaction or flexibility are associated with early recognition of environmental jolts (Meyer, 1982) and emerging environmental events (Milliken, 1990), and interpretive accuracy (Sutcliffe, 1994).

Empirical support for a positive relationship between information processing capacity and data search is provided by Thomas and McDaniel (1990). They argued that when top management teams are characterized by high levels of participation, interaction and flexibility, managers will attend to more data and consider each piece of data more fully during interpretation efforts than they can in teams with low information processing capacity. Furthermore, since managers tend to reduce search and simplify decision rules in times of information overload



(Abelson and Levi, 1985; Schneider, 1988), and managers of high information processing capacity teams are less vulnerable to information overload (Mintzberg, 1983), managers in such teams should search for more data in elaboration of strategic issues. Finally, if high information processing capacity facilitates more active modes of thinking, managers in such teams may to a lesser extent oversimplify complex situations and limit data search. Thus, according to an organizational information processing perspective:

*Hypothesis 2a:* The information processing capacity of an organization's top management team will be negatively related to top managers' control and manageability perceptions and positively related to data search.

Thomas and McDaniel (1990) also found that high information processing capacity of top management teams was significantly positively related to positive-gain and controllability interpretations. The authors' interpretation of these findings is that a greater number and variety of active information processors, due to high levels of participation, interaction and flexibility, provides the team with the information needed to effectively exploit and control issues. However, other findings suggest that top management teams with high information processing capacity tend to focus on and process information that they see as positive and as leading to potential gains, even in times of crisis (e.g. Smart and Vertinsky, 1984). Conceptual behavioural decision research on cognitive biases and strategic decision processes may account for these findings. To the extent that high information processing capacity implies more comprehensive decision processes, members of such teams may suffer from illusion of manageability (Das and Teng, 1999). It has also been suggested that wishful thinking and rationalization are possible biases in comprehensive processes (Lyles and Thomas, 1988) and that merely going through such processes provides justification and rationality (Das and Teng, 1999). This, in turn, may cause managers to overestimate their perceptions of control and manageability when confronted with ill-structured issues.

These suggestions are consistent with social cognitive group research and the rationale construction hypothesis that Heath and Gonzalez (1995) put forward as an alternative to the information collection view of interaction. They suggested that people become more confident after interaction because interaction stimulates them to generate explanations for their choices and beliefs. In support of the rationale construction hypothesis, Heath and Gonzalez (1995) conducted three studies that showed that interaction produced robust increases in confidence. Similar findings have been obtained by Dunning and colleagues (e.g. Dunning et al., 1990). Besides, interaction and participation (two of the structural characteristics of high information processing capacity) are often positively related to group cohesion and satisfaction (Black and Gregersen, 1997; Long, 1984; Wagner, 1994). High levels of cohesiveness and satisfaction may in turn motivate group members to avoid being too harsh in their judgement of their colleagues' ideas (Janis, 1972). Pessimistic opinions might be interpreted as disloyalty and therefore be suppressed and exchanges of views will fail to perform a critical function. Moreover, the potential resulting optimistic bias of individual group members can become mutually reinforcing, as unrealistic positive views are validated by group approval (Kahneman and Lovallo, 1993). Finally, in a simulation study of team certainty, Isabella and Waddock (1994) found that bank officers and managers were more

certain about changes taken place in the environment when they reported high levels of team orientation. Thus, to the extent that interaction, and participation facilitate team orientation, as well as group cohesion and satisfaction, members of top management teams with high information processing capacity may to a lesser extent engage in vigilant information processing. Thus, according to behavioural decision making and social cognitive group research:

*Hypothesis 2b:* The information processing capacity of an organization's top management team will be positively related to top managers' control and manageability perceptions and negatively related to data search.

## METHODS

### *Sample*

Survey questionnaires were mailed to 231 top management team members of the 93 largest newspaper firms in Norway. Members of the top management team were operationally defined as the newspaper's president, editor or 'single manager' (i.e. managers that have editorial as well as managerial responsibility), and executives who report directly to the president, editor or single manager and at the same time are involved in strategic analysis and decision making. Two mail prompts and a telephone follow-up generated 162 usable questionnaires representing 73 newspaper firms, a response rate of approximately 70 per cent. Non-response bias was analysed with regard to competitive posture and circulation size, based on available data from the Norwegian Newspaper Association (NAL, 1997). The analysis revealed that respondents were employed in firms with higher circulation size than non-respondents. No differences were found for competitive posture. The number of respondents per firm ranged from 1 to 5 with an average of 2.22. In 46 of the 73 firms, two or more managers completed and returned the questionnaire, leaving 27 single informant responses. About half the respondents held top positions in their firms (36 presidents, 21 editors and 23 single managers) while the remaining 82 respondents held lower top management team positions.

### *Measures*

*Dependent variables.* As in most prior investigations of managers' issue interpretation (e.g. Denison et al., 1996; Thomas and McDaniel, 1990; Thomas et al., 1993, 1994), a field simulation method (Fredrickson, 1986) was used to measure the dependent variables. In short, this is a two-phase research method using interviews and expert input to first develop case scenarios designed to mirror strategic issues. Then, written case vignettes are distributed to managers which they respond to by filling out vignette related items in a questionnaire. This approach offers expert input in the form of real managers as well as theoretically driven control over the stimulus material (Fredrickson, 1986; Nichols and Dukerich, 1991). By providing a common point of reference across informants, case vignettes enable the assessment of variance in interpretation that likely exists between managers facing the same development, trend or event. Moreover, in the present study, five case vignettes were used in order to investigate issue interpretation across different issues. Interviews with industry experts were conducted in order to refine and



cross-check that vignettes were strategically relevant across newspaper firms. Finally, conducting a single industry study made it easier to construct vignettes that were domain relevant and sufficiently realistic, interesting and detailed enough to stimulate cooperation and commitment from respondents.

Two case vignettes (one describing a threat and one an opportunity) were developed to measure perceptions of controllability (see Appendix for sample vignettes). To measure manageability perceptions, two additional case vignettes containing descriptions of two different organizational problems (one external and one internal) were presented to the respondents. Following Jackson and Dutton (1988) and later refinements by Thomas and McDaniel (1990) and others (e.g. Thomas et al., 1993), previously used items were employed to measure *controllability* associated with the threat and opportunity vignettes (two items for each scenario) and *manageability* associated with the vignettes containing the external and internal problems (three items for each scenario). Managers responded on a 7-point Likert scale with anchors ranging from 'very little extent' to 'very great extent'. As a proximation to convergent and discriminant validation (e.g. Carmines and Zeller, 1979; Dess and Beard, 1984; Nunnally and Bernstein, 1994), a principal component analysis (PCA) with four factors was conducted. Oblique rotation was used since the dimensions were assumed to correlate (Hair et al., 1998). Table A.I (Appendix) presents the results of the factor analyses and reveals that controllability and manageability associated with the four case scenarios were viewed as distinct dimensions by the respondents. Coefficient alphas for the controllability variables were 0.81 (opportunity) and 0.55 (threat), and 0.82 (internal problem) and 0.70 (external problem) for the manageability variables.

To measure *data search*, another short case vignette was presented to the respondents. The scenario described a problem where two major advertisers had signalled a significant decrease in the purchase of advertisements from the newspaper. No precise information was provided as to why this was happening, but several possible reasons were mentioned. After reading the case scenario, managers were asked to indicate the extent to which he or she would use each of eight different sources of information to clarify and define the strategic situation presented in the case scenario. These elements of information were constructed as items that varied in how closely they were related to the presented problem and how effortful the gathering of the information would be. Three items contained questions about historical data on the advertising market, and five items were related to search and gathering of new data. Respondents were reminded that data gathering in real situations is costly (Dukerich and Nichols, 1991). Managers responded on a 7-point Likert scale with anchors ranging from 'very little extent' to 'very great extent'. To test the posited two-dimensionality of the data search construct, a PCA with two factors and oblique rotation was conducted. The result of the factor analysis supports this conception (see Table A.II, Appendix) and the scales demonstrate acceptable reliability (0.81 for new data and 0.70 for historical data).

*Independent variables.* *Organizational information availability* was measured by seven questions asking how readily available different types of information are to top managers in the newspaper (scientific and popular journals, reports from researchers and consultants, public and governmental reports and newsletters, etc.). Managers responded on a 7-point Likert scale with anchors ranging from 'very little extent' to 'very great extent' (coefficient alpha = 0.84).

*Top management team (TMT) information processing structure* was measured by a sample of items from Duncan (1973, p. 74) and others (Thomas and McDaniel, 1990; Thomas et al., 1994) supposed to measure participation, flexibility and interaction. However, PCA suggested a two-dimensional solution (see Table A.III, Appendix) consisting of top management team participation (five items,  $\alpha = 0.79$ ) and top management team flexibility (two items,  $\alpha = 0.68$ ).

Since information availability and top management team information processing structure are measures of organizational and group phenomena, members of the same organizations should ideally demonstrate high levels of agreement in rating these variables. To perform a conservative test of this assumption, the extent of agreement (or reliability) among managers from the same organization were assessed by contrasting within- and between-organization variance (e.g. Klein et al., 1994). One-way analysis of variance of ten organizations with four to five respondents in each ( $n = 42$ ), showed that for TMT participation ( $F = 2.69$ ,  $p = 0.02$ ) the variance between organizations was significantly greater than within organizations. However, for information availability ( $F = 1.13$ ,  $p = 0.37$ ) and TMT flexibility ( $F = 1.57$ ,  $p = 0.16$ ), the between organization variance was not significantly higher than the within organization variance. In general, such disagreement in ratings may typically arise because managers hold different organizational positions and thus different perspectives on the same organizational phenomena (Kumar et al., 1993). Thus as an alternative test of interrater agreement, the explained variance by managerial position and organizational affiliation was contrasted. A one-way ANOVA analysis for managerial position showed no significant differences between top managers and those with lower TMT positions. Moreover, a comparison of the eta squared values indicate that organizational affiliation is a much better explanation of variance in all three variable (information availability = 0.24, TMT participation = 0.43, and TMT flexibility = 0.31) than is managerial position (information availability = 0.01, TMT participation = 0.04, and TMT flexibility = 0.00). Consequently, it was concluded that interrater reliabilities of these variables were acceptable.

*Control variables.* *Organizational size* was included as a control variable since it has previously been found to influence strategic issue interpretation (Denison et al., 1996; Thomas et al., 1994). Size was measured as the average weekly circulation of newspapers by multiplying the number of issues per week with the average daily circulation. The distribution of the measure was skewed to the left and was markedly peaked, as indicated by high positive skewness and kurtosis values. Therefore, a logarithmic transformation was applied.

We also controlled for two individual variables, *managerial position* and *cognitive complexity*. Managerial position was included since the single top managers are those most responsible for interpreting issues related to aligning an organization's strategy, structure, and environment (Ritvo et al., 1979) and might therefore be more sensitive to strategic issues than TMT members with lower positions. Managerial position was coded as a dummy variable (1 = top manager and 0 = other TMT members). Cognitively complex individuals have higher tolerance for ambiguity and diversity than their less complex counterparts (Streufert et al., 1968), which may impact perceptions of controllability and manageability. Moreover, they are usually better able to search for near-adequate amounts of relevant information (Streufert and Nogami, 1989) and seek more novel information across a

greater number of information categories (Streufert and Swezey, 1986). Since the literature did not offer any measure of cognitive complexity that efficiently assesses both differentiation and integration and at the same time is suitable for a survey (e.g. Streufert and Nogami, 1989), I only measured cognitive differentiation. To measure differentiation, a shortened and refined version of the Driver-Streufert Complexity Index (DSCI) (Driver et al., 1990; McGill et al., 1994) was used. A pilot study among 123 employees at the Norwegian School of Management was conducted to develop and test the representativeness of the shortened version (Kuvaas, 1998). As shown in Table I, the eight-item differentiation scale demonstrated less than ideal reliability ( $\alpha = 0.67$ ).

## RESULTS

Table I presents the means, standard deviations, and correlation coefficients for the variables used, as well as the reliability coefficients for the multi-item scales. Table II presents the results of the multiple regression analyses used to test the hypotheses. The results indicate that information availability is positively related to controllability perceptions of the opportunity ( $b = 0.20, p < 0.01$ ) and threat ( $b = 0.18, p < 0.05$ ) but not significantly related to manageability perceptions or data search. Thus, Hypothesis 1a is rejected while Hypothesis 1b is partly supported. Hypothesis 2b receives stronger support as TMT flexibility is positively related to controllability perceptions of the threat ( $b = 0.22, p < 0.01$ ) and negatively related to data search in terms of historical data ( $b = -0.16, p < 0.05$ ) and new data ( $b = -0.33, p < 0.001$ ). Moreover, TMT participation is positively related to controllability perceptions of the opportunity ( $b = 0.17, p < 0.05$ ) and manageability perception of both the internal ( $b = 0.20, p < 0.05$ ) and the external ( $b = 0.24, p < 0.01$ ) problem. Thus, Hypothesis 2a is rejected.

## DISCUSSION

This study began with two competing perspectives on the effects of informational context on top managers' issue interpretation. The findings obtained indicate that top managers whose organizations have environmental information readily available to them perceive higher control over issues than top managers in organizations with lower informational availability. Moreover, managers in top management teams with higher information processing capacity seem to perceive higher degrees of control and manageability, and search for less data in issue interpretation, than managers in top management teams with lower information processing capacity. Overall, these results offer some support for the hypotheses grounded in behavioural decision making and social cognition research, and no support for the organizational information processing hypotheses.

A few comments on the interpretation of some of the dependent variables are worth noting before proceeding with the discussion of the findings and their implications. It is important to note that higher levels of control and manageability perceptions are not equivalent with positive *illusions* such as *overly* positive interpretations or *unrealistic* control or optimism. The issue interpretation literature only posits that perceived control and manageability are indicative of optimistic and positively

Table I. Descriptive statistics, correlations and scale reliabilities<sup>a</sup>

	<i>Means</i>	<i>s.d.</i>	<i>1</i>	<i>2</i>	<i>3</i>	<i>4</i>	<i>5</i>	<i>6</i>	<i>7</i>	<i>8</i>	<i>9</i>	<i>10</i>	<i>11</i>	<i>12</i>
1. Controllability (opportunity)	4.72	1.31	(0.81)											
2. Controllability (threat)	3.77	1.18	0.09	(0.55)										
3. Manageability (internal)	2.59	1.04	0.34	0.12	(0.82)									
4. Manageability (external)	3.89	1.12	0.25	0.12	0.27	(0.70)								
5. Historical data	4.66	1.18	-0.03	-0.04	-0.06	-0.04	(0.70)							
6. New data	4.91	1.11	0.00	-0.15	-0.04	0.03	0.55	(0.81)						
7. Information availability	4.54	1.09	0.27	0.13	0.16	0.11	0.15	0.15	(0.84)					
8. TMT flexibility	4.17	1.37	-0.04	0.19	0.01	-0.15	-0.17	-0.33	-0.15	(0.68)				
9. TMT participation	5.04	1.02	0.26	0.00	0.25	0.25	0.06	0.13	0.31	-0.13	(0.79)			
10. Organizational size	4.97	0.53	0.30	0.03	0.19	0.21	-0.03	0.00	0.12	-0.05	0.07	n.a.		
11. Cognitive complexity	3.73	0.41	0.12	0.02	0.14	0.12	0.15	0.23	0.19	-0.02	0.09	0.22	(0.67)	
12. Managerial position	0.49	0.50	0.03	0.00	0.12	-0.09	-0.02	0.02	-0.03	-0.08	0.09	-0.30	0.05	n.a.

<sup>a</sup>N = 162. Coefficient alphas indicating scale reliabilities are in parentheses. Correlations greater than 0.15 are significant at  $p < 0.05$ ; those greater than 0.20 are significant at  $p < 0.01$ .

Table II. Summary of multiple regression analysis results

	<i>Controllability</i>		<i>Manageability</i>		<i>Data search</i>	
	<i>Opportunity</i>	<i>Threat</i>	<i>Internal problem</i>	<i>External problem</i>	<i>Historical data</i>	<i>New data</i>
<i>Control variables</i>						
Size	0.30***	0.03	0.20*	0.16 <sup>†</sup>	-0.11	-0.09
Cognitive complexity	0.00	-0.02	0.06	0.05	0.18*	0.25**
Managerial level	0.10	0.04	0.17*	-0.07	-0.09	-0.07
<i>Independent variables</i>						
Information availability	0.20**	0.18*	0.09	-0.01	0.10	0.03
TMT flexibility	0.03	0.22**	0.08	-0.12	-0.16*	-0.33***
TMT participation	0.17**	-0.02	0.20*	0.24**	-0.01	0.05
<i>Overall model</i>						
F	5.90***	1.75	3.64**	3.55**	2.09 <sup>†</sup>	5.41***
R <sup>2</sup>	0.19	0.07	0.13	0.12	0.08	0.18

<sup>†</sup>p < 0.10.

\*p < 0.05.

\*\*p < 0.01.

\*\*\*p < 0.001.

valenced interpretations of issues (e.g. Ginsberg and Venkatraman, 1995; Jackson and Dutton, 1988) signalling confidence in the organization's capability to deal with an issue (Dutton, 1993b). Having this interpretation in mind, the positive relationships between information availability and the two controllability variables are consistent with the underlying mechanisms proposed in prior research on the effects of information on illusions of control (Langer, 1983; Schwenk, 1986) and overconfidence (e.g. Davis et al., 1994; Jacoby et al., 1974a, 1974b; Van Raaij, 1988; Zacharakis and Sheperd, 2001), and the role of information as a symbol of competence (Feldman and March, 1981; Langley, 1989). Thus the findings suggest that the mere existence of information may increase top managers' confidence and decrease their uncertainty. Several authors (e.g. Feldman and March, 1981; Langley, 1989; Meyer and Rowan, 1977) have suggested that organizations adopt formal procedures to enhance their survival prospects, even though these procedures may not serve any immediate instrumental purpose. Similarly, information resulting from formal information acquisition activities may enhance top managers' beliefs about their organizations' ability to deal with issues, even if the information is not analysed or used to enhance issue understanding.

The significant and negative relationships between the TMT information processing capacity variables and the data search, controllability and manageability variables are consistent with the theoretical underpinnings or research positing that group dynamics may facilitate overconfidence and control illusions through justification, rationalization, cohesiveness and strong team orientation (e.g. Das and Teng, 1999; Heath and Gonzalez, 1995; Janis, 1972; Kahneman and Lovallo, 1993). More specifically, these findings support the ideas behind Das and Teng's (1999) recent proposition that rational and systematic decision processes characterized by intense discussion and evaluation of alternatives may lead to an illusion of manageability. Moreover, vigilant responses to issues as reflected by the data

search variables may also support Weick's (1995) ideas about plausibility versus accuracy in managerial sensemaking. Accurate interpretations may result from lower levels of perceived control and manageability, and high levels of data search. Plausible interpretations in the form of agreed-upon environmental perceptions providing enough certainty to deal with issues, in contrast, may result from collective sensemaking processes as reflected in higher levels of TMT participation and flexibility.

Finally, although the results of the present study are consistent with prior research on information and positive illusions, they should not be taken as empirical support for a positive relationship between informational contexts and *overconfidence*, or *illusions* of control or manageability. Still, this does not rule out the possibility that such a relationship may actually exist. First, in the context of uncertain (Mintzberg et al., 1976), ambiguous and ill-structured (Lyles, 1981) strategic issues in complex and dynamic organizational environments, high levels of control and manageability may be indicative of unrealistic control beliefs, i.e. perceptions of control in circumstances where control is not objectively possible (Zuckerman et al., 1996). Second, in such circumstances it is also possible that data search reflects top managers' recognition that there is more to be learned about an issue, and a need to engage in more vigilant and deeper investigation of the situation at hand (Thomas and McDaniel, 1990). Indeed, measures of data search have been proposed as proxies for 'mindful' versus 'mindless' cognitive processing (e.g. Dunegan, 1993; O'Reilly, 1983). Moreover, in the current study, the control variable cognitive complexity was significantly and positively related to both data search variables, and cognitively complex individuals typically search for near-adequate amounts of relevant information (Streufert and Nogami, 1989). Thus, the interpretation that managers who search for less data are less aware of issues has more face validity than the one that these managers are 'smarter' or more selective in the types of data sources they request. However, without measures of performance, perceptual accuracy, objective control or manageability, it is not possible to dismiss the interpretation that managers in rich information contexts might rightfully report high levels of control and manageability, and that they do not need to make any effort to collect data because they already are well informed.

#### *Limitations and Suggestions for Future Research*

This study has several limitations that should be considered when interpreting the results. First, it should be noted that data on the dependent variables were obtained through questionnaire responses to hypothetical (though very realistic) case vignettes, not through observing managers' actual strategic issue interpretation. Second, a single instrument was used to assess all study variables, thus creating a potential common method bias. Third, some of the measures suffered from less than ideal coefficient alphas, but except from the uncontrollability scale, they were acceptable for explorative and theoretical purposes according to most conventions and standards (e.g. Finkelstein, 1992). Finally, the conclusions derived from this study must be checked by research conducted in several industries to test the case for generalizability. This investigation was conducted in the newspaper industry, and relationships may differ in other types of industries.

As indicated by relatively low explained variance for most of the regression models, there may be many other potentially better explanations for the depen-



dent variables. Prior research points to less indirect antecedents to positively valenced interpretations or positive illusions, such as prior organizational success (e.g. Hayward and Hambrick, 1997; Martins and Kambil, 1999; Milliken and Lant, 1991), lack of board vigilance, recent media praise and self-importance of top managers (Hayward and Hambrick, 1997), and intense competition (Fenton-O'Creevy et al., 1999). Future research should investigate whether informational contexts have independent effects when such factors are also considered.

Another important research avenue is to explore alternative informational contexts. The current study has investigated informational contexts in terms of availability of environmental information and top management team information processing capacity. The relatively general nature of the information used to measure information availability may explain why this particular context did not seem to increase vigilance in issue interpretation. Lack of specificity of information and lack of integration of environmental information into the broader strategic management process, have been put forward in explaining why information activities often fail to increase managerial awareness (Diffenbach, 1983; Jain, 1984; Lenz and Engledow, 1986; Stubbart, 1982). Thus, future research should examine other informational contexts like organizational scanning (e.g. Aguilar, 1967; Yasai-Ardekani and Nystrom, 1996) and information technology use (Huber, 1990). Further, since positive illusions caused by information may be explained by the tendency to confound relevant and irrelevant information (Van Raaij, 1988), more detailed information characteristics like relevance, specificity and timeliness should be examined.

The overall aim of the present study was to compare and contrast two disparate theoretical perspectives on the effects of information in the context of top managers' strategic issue interpretation. The extent to which different levels of perceived control and manageability, and data search, are adaptive or maladaptive should be explored in future research. Weick (1995) and others (e.g. Isenberg, 1986; Starbuck and Milliken, 1988b) have taken the position that managers do not need accurate, but plausible and reasonable environmental perceptions. Even positive illusions can be adaptive, as they increase motivation and persistence (Dutton, 1993b; Taylor and Brown, 1988), and actions that are more directed, more coherent, bolder, and more timely (Isabella and Waddock, 1994). In contrast, such positivity may also cause insensitivity to feedback, less learning and predispositions to maladaptive risk taking (Gollwitzer and Kinney, 1989; Hayward and Hambrick, 1997; Lai, 1994; Starbuck and Milliken, 1988a). The psychological literature on control has also pointed out that adverse consequences of high perceived control are usually found for perceptions of control in circumstances where control is not objectively possible (Fenton-O'Creevy et al., 1999; Zuckerman et al., 1996), which may be the case for strategic issues. In this context, more than moderate positively valenced interpretation may curtail managers' desire to understand an issue (Mintzberg et al., 1976) because they may assume that they can simply exploit opportunities without conducting extended analysis (Fredrickson, 1985). This may lead managers to act in an overly simplistic manner toward strategic issues even though they are ill-equipped to capitalize on possible opportunities (Thomas et al., 1993). However, much remains to be learned about the wider implications of controllability, manageability and data search behaviour in a strategic issue context.

### *Contributions to Research*

The present study contributes to organizational research in several ways. First, it adds directly to organizational information processing research by providing field study indications that informational contexts in organizations may have a comforting or confidence enhancing, rather than an awareness increasing effect on top managers' issue interpretation. Advocates of the information processing view of organizations have long argued that, past some optimal point, too much information can lead to decreased performance (e.g. Tushman and Nadler, 1978). However, in explaining information overload effects, references are made to feelings of stress, time pressure and distractions (O'Reilly, 1980; Schick et al., 1990; Schneider, 1988). The findings obtained in this study suggest that high information availability and high TMT information processing capacity are associated with positive, rather than negative, emotions or cognitions, which under certain conditions might affect performance negatively. Second, most organizational information processing research on managers' environmental perceptions have relied on general or global perceptions of uncertainty in the firm's environment (e.g. Lang et al., 1997). Such general perceptions may be too abstract to represent environments in terms with which managers are familiar (Sutcliffe, 1994), and too vague and unfocused to be meaningfully related to decision or actions (e.g. Lang et al., 1997). Using a field simulation method of strategic issue interpretation, this study was able to examine detailed aspects of informational effects on top managers' perceptions across several realistic and more focused issues.

Provided that high levels of control and manageability could be interpreted as an indication of potentially unrealistic beliefs, the current research also contributes to research on positive illusions conducted in laboratories or other controlled settings (e.g. Davis et al., 1994; Langer, 1983; Oskamp, 1965). Thus, this study is an example of the partnership between the basic and applied research that has emerged within the field of managerial and organizational cognition within the past decade (Walsh, 1995). It builds on the predominantly single level experimental research on positive illusions, and extends this literature by investigating actual top managers faced with strategic issues and considering the context within which individual level information processing takes place. Finally, by controlling for individual level variables, the study also represents a step towards responding to calls by prior researchers for empirical examinations of multiple-level factors that influence the formation of top managers' interpretations (e.g. Thomas et al., 1994; Weick, 1995). Moreover, the control variable cognitive complexity, that measures how managers structure information (Streufert and Swezey, 1986), was significantly related to both data search variables. Accordingly, informational contexts at the individual, team and organizational levels of analyses were all uniquely related to some of the dependent variables. These findings suggest that any attempt to explain or predict how managers interpret strategic situations is incomplete unless it addresses multiple sources of informational contexts.

### *Implications for Managers*

The findings of the research reported here might also have some implications for executives and decision-makers. First, while the intuitive importance of information overload caused by high levels of stress and confusion is often noted, the comforting, soothing or reassuring, and *potentially* dysfunctional effect of information may be less acknowledged. Therefore, managers should be aware that

information may foster unrealistic control or optimism, particularly in combination with other circumstances in which managers may develop positive illusions (e.g. Hayward and Hambrick, 1997; Martins and Kambil, 1999; Milliken and Lant, 1991). Second, the finding that top management teams with high information processing capacity seems to enhance very positive outlooks, highlights the importance of systematic process aids (e.g. devil's advocacy and dialectical inquiry (Cosier and Schwenk, 1990; Schweiger et al., 1989)) to improve the level of independence of issue interpretation from the context in which managers are embedded (e.g. Denison et al., 1995).

#### CONCLUSION

Top managers in organizations are continuously confronted by an array of ambiguous data and vaguely felt stimuli which they must somehow order, explicate and imbue with meaning before they decide on how to respond. By regulating what information to acquire and how accurate, timely and exhaustive that information should be, organizational information processing may assist managers in these sensemaking activities. While an information processing perspective has posited that increasing the flow of information within organizations may be particularly important in enhancing managers' environmental awareness, the two hypotheses grounded in this perspective received no support in the study reported here. Due to the relatively modest support obtained for the competing hypotheses and the limitations discussed previously, it is realized that the results and their implications should be treated with caution. However, it could still be concluded that the overall pattern of the results obtained question the observation made by prior researchers that organizations engaging in active information processing are more aware of the environment and more likely to assess environmental developments, trends or events in a more vigilant manner (e.g. Daft and Weick, 1984; Dutton, 1993a; Huber and Daft, 1987).

#### NOTE

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#### APPENDIX

##### *Sample of Case Vignettes Used in the Questionnaire:*

*Opportunity scenario.* The Parliament has recently passed a bill that reduces tax on cars and private estates. For an average car the tax reduction will be about NOK 12,000, and the sales tax for private estates will be reduced from 2.5% to 1.5%. Most experts agree that these tax reductions will result in significantly faster circulation of cars and private estates and thereby increase the volume of newspa-

per advertisements. Moreover, the latest reports from both the National Bank and from OECD conclude that the Norwegian economy will experience a balanced growth for the next few years.

*Threat scenario.* The largest real estate offices and auto dealers in the country (representing about 70 per cent of private estate and car sales) have established a nationwide joint venture for advertisement cooperation. The purpose of the joint venture was to establish an organization for electronic advertisement of private estates and cars. It is expected that the Internet site will be running next month. Planning joint arrangement for text-TV and local TV is also a part of the joint venture. The President of the joint venture has announced that the ultimate goal of the cooperation is to replace traditional newspaper ads. This far, however, electronic advertisement will primarily supplement traditional advertisement in newspapers. As part of the joint venture it has also been declared that other types of goods and services might be included in the arrangement. Here, ads for jobs are emphasized as particularly interesting.

Results of factor analysis are presented in Tables A.I. to A.III.

Table A.I. Controllability and manageability, PCA with oblimin rotation

<i>Items</i>	<i>Factors</i>			
	<i>1</i>	<i>2</i>	<i>3</i>	<i>4</i>
<i>Manageability (internal problem)</i>				
Sufficient knowledge to understand	<b>0.91</b>	0.01	0.01	-0.04
Easy to understand cause-effect relationships	<b>0.89</b>	-0.03	0.00	0.19
Sufficient resources to manage	<b>0.75</b>	0.08	0.02	-0.23
<i>Manageability (external problem)</i>				
Sufficient knowledge to understand	0.10	<b>0.81</b>	-0.13	-0.12
Easy to understand cause-effect relationships	-0.07	<b>0.77</b>	0.19	0.18
Sufficient resources to manage	0.10	<b>0.72</b>	-0.21	0.26
<i>Controllability (threat)</i>				
Difficult to control <sup>a</sup>	0.09	-0.06	<b>0.85</b>	-0.19
Lack the capability to control <sup>a</sup>	-0.08	0.06	<b>0.78</b>	0.14
<i>Controllability (opportunity)</i>				
Easy to capitalize	-0.04	0.02	0.09	<b>-0.90</b>
Capability to capitalize	0.04	-0.01	-0.03	<b>-0.89</b>
Initial eigenvalue	3.40	1.47	1.36	1.29
Pct. of variance	34.03	14.73	13.58	12.90
Coefficient alpha for final scales	0.82	0.70	0.55	0.81

<sup>a</sup>Reverse coded.

Table A.II. Data search, PCA with oblimin rotation

<i>Items</i>	<i>Factors</i>	
	<i>1</i>	<i>2</i>
<i>New data</i>		
Future strategies of advertisers	<b>0.88</b>	-0.09
Methods and costs of doing advertising effect measurement	<b>0.82</b>	0.01
New segments of possible advertisers	<b>0.77</b>	0.02
Other existing customers relationships with Beta	<b>0.62</b>	-0.01
Future development of the advertising market	<b>0.59</b>	0.28
<i>Historical data</i>		
Historical internal information on advertiser satisfaction	-0.09	<b>0.85</b>
Historical internal information on new and quitting customers	0.01	<b>0.78</b>
Historical information about possible structural market changes	0.17	<b>0.70</b>
Initial eigenvalue	3.76	1.08
Pct. of variance	47.00	13.45
Coefficient alpha for final scales	0.81	0.70

<sup>a</sup>Reverse coded.

Table A.III. TMT information processing structure, PCA with oblimin rotation

<i>Items</i>	<i>Factors</i>	
	<i>1</i>	<i>2</i>
<i>Participation</i>		
SP&DM characterized as a group activity	<b>0.82</b>	-0.20
Possibility of mutual influence	<b>0.78</b>	0.13
Free and open exchange of ideas	<b>0.77</b>	0.05
All members participate in SP&DM on a regular basis	<b>0.76</b>	0.24
One or two people dominate the handling of strategic issues <sup>a</sup>	<b>0.57</b>	0.26
<i>Flexibility</i>		
A single set of written rules and procedures followed <sup>a</sup>	0.10	<b>0.86</b>
SP&DM characterized as rule-oriented <sup>a</sup>	-0.16	<b>0.83</b>
Initial eigenvalue	2.87	1.54
Pct. of variance	40.95	22.05
Coefficient alpha	0.79	0.68

<sup>a</sup>Reverse coded.

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