"Technical Consultants and Organisational Learning in IT Purchase Situations"[1]

Though it is widely acknowledged that both organisational learning and the purchasing of IT products are important areas for study, it is surprising to find that very little research has explicitly linked these two areas together. As a result, the key reason for undertaking this research is to begin to address this gap in the literature by developing a model which is based on a review of the extensive literature on organisational buying behaviour, organisational information search, and organisational learning. In addition, a key contribution of this research is to model the effects that outside IT consultants are likely to have on the processes of information search and organisational learning in firms purchasing this type of product.

Introduction

The research presented here focuses on the link between the two processes of *information search* and *organisational learning* in IT purchase situations. Because such situations are information intensive (Weiss and Heide 1993), there should be significant opportunity for firms to acquire new information and knowledge so that there is significant potential for organisational learning to take place. Moreover, we also model the effects that external consultants are likely to have on these two processes. The inclusion of consultants is justified on the grounds that numerous theorists argue that they are likely to have a pronounced effect on organisational learning in a wide variety of high-technology contexts (e.g., Cyert and March 1992). Though no empirical studies could be found which had examined the effects of consultants on organisational learning, there is a small but growing body of empirical evidence indicating that IT consultants have strong effects on search processes in organizations which have hired them to help make high-technology purchases (e.g., Dawes 1996).

Moreover, the need to examine the effects of management consultants seems important because the use of these external experts in firms making IT purchase decisions is now so widespread. This is evidenced by the fact that for the first time in 1996 (The Economist 1997), the 100 biggest US accountancy firms earned more from consulting ($8.3 billion) than they did from either auditing ($7.9 billion) or tax ($5 billion). In addition, and in response to the desire for firms to have technical advice when buying high-technology products, many of the largest suppliers of IT (e.g., IBM) have formed their own consulting arms. The critical importance for IT suppliers to have their own consulting businesses was recently illustrated by Compaq's 1998

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acquisition of Digital Equipment on the grounds that it mostly wanted Digital's very successful consulting arm (The Economist 2000).

A central feature of this research is that a *contingency approach* is adopted to predict the effects of consultants on information search and organisational learning. This approach is used because research by Dawes (1996) suggests that consultants possess contingency scripts that guide their behaviour when providing assistance in firms making high-technology purchase decisions. The essential notion of the contingency approach is that all human behaviour is a series of ongoing adjustments and accommodations, which reflect the demands of an existing situation (Freidman and Churchill 1987). In short, the basic premise of this research is that IT consultants will adjust their behaviour according to the characteristics of the buying centre that is formed in the firm making the purchasing decision. As a result of this adjusted behaviour, it is expected that the effects of consultants on search processes and organisational learning will also be contingent on (or moderated by) the characteristics of the buying centre.

Conceptual Framework

Organisational learning. This research focuses on double-loop learning as opposed to single-loop learning. This approach is predicated on the grounds that the context of this research is the purchasing of large-scale, IT products where due to technological heterogeneity and the rapid pace of technological change, there is much uncertainty, which prompts buyers to acquire new information and change the criteria of evaluation (Heide and Weiss 1995). When there are such changes in the subprocesses of learning, double-learning is likely to occur (Argyris and Schön 1978).

Participation of a consultant. In line with Patterson and Dawes (1999), participation is defined as the level of involvement that a consultant has in each of the eight major decision stages which typically characterize large-scale, new-task purchase situations. Prior research shows that consultants have high to moderate involvement in the first seven decision stages (Patterson and Dawes 1999). Importantly, research by Dawes (1996) also found that consultant participation varies according to the characteristics (e.g., heterogeneity) of the buying centre.

Organisational information search. Organisational information acquisition through search can be viewed as occurring in three forms: scanning, performance monitoring, and focused search (Huber 1991). Here, we examine *focused search*, which occurs when organisational members, in response to actual or suspected problems or opportunities, actively search in a narrow segment of the organization's internal and/or external environment (Huber 1991). As part of this research focus, we investigate how organisational learning is related to three "sources" of information: (a) internal sources, such as people in user departments; (b) external sources regarding suppliers and their products; and (c) external consultants.

Here, the above three sources of information are modelled as endogenous variables. And, in order to better understand the relationship between these three sources of information and organisational learning, we follow Nonaka (1994), who argued that there are two broad types of information which he called *syntactic* and *semantic*. The first type relates to the volume of information while the second refers to the conveyed meaning of the information.

Characteristics of the buying centre. As noted, a key premise of this research is that it is argued that the effects of consultants on information search and

organisational learning are contingent on the characteristics of the buying centre which is formed to make the purchase decision. Drawing on the relevant literature regarding group decision-making behaviour (e.g., Rao and Jarvenpaa 1991), three characteristics were identified: *heterogeneity*, *familiarity*, and *viscidity*.

Model Development

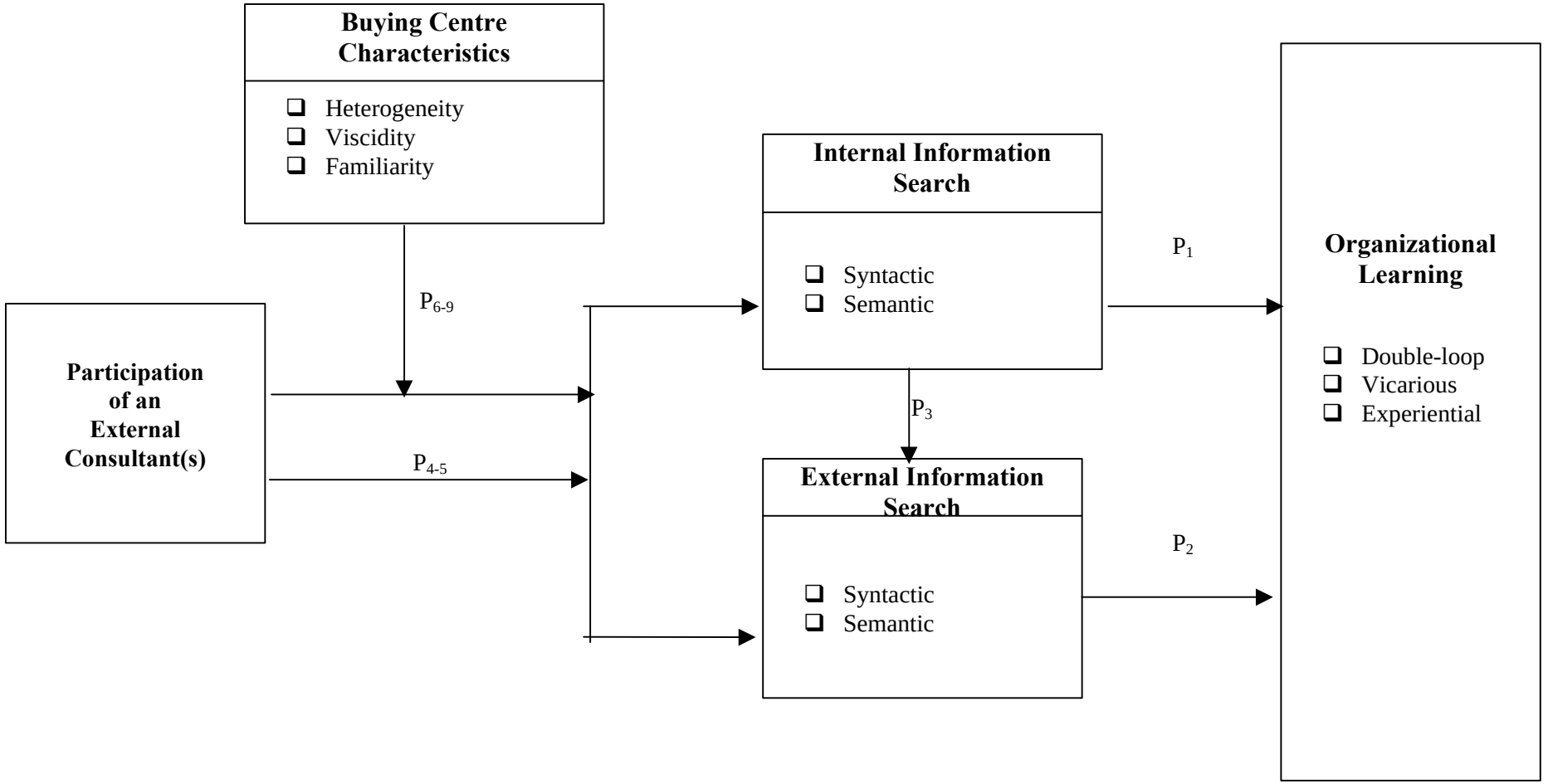
The conceptual model for this research is outlined in Figure 1 (see next page). In total, eight research propositions are developed. The first three (P_1 to P_3) concern the relationship between internal information search, external information search, and organizational learning. The next two propositions (P_4 and P_5) relate to the main effects of technical consultants on internal information search and external information search. Finally, and based on the contingency approach adopted in this research, three propositions (P_6 to P_8) are put forward regarding possible *interaction* (or *moderating*) *effects* between consultant participation and the buying centre characteristics of heterogeneity, viscidity, and familiarity. In the interests of parsimony, no direct (main) effects from either consultant participation or buying centre characteristics to organizational learning are proposed.

Propositions 1 and 2: Information search and organizational learning

A key assumption of this research is that in high-technology purchase situations, the process of organizational information search can be conceived as having two dimensions namely, internal search and external search. Moreover, it is proposed that the outcomes of these two types of search processes are likely to have a positive relationship with the amount of double-loop organizational learning. With respect to internal search, it seems reasonable to expect that as members of a buying centre expend more effort in fact finding about the needs of all the relevant sub-units within the firm, they are likely to be exposed to a wide diversity in the opinions about the requirements and likely impacts of the new technology. In such situations, through experiential learning, buying centre members are likely to gain greater understanding, obtain new insights, and so learn more about the proposed new technology. Similarly, as buying centre members spend more time in seeking out external information from sources such as vendors, exhibitions, magazines, users in other firms, websites, they are likely to learn more about the many issues which surround the purchasing of the high-technology product of the type under consideration.

However, it is also argued that the strength of the relationship is likely to be affected by the type of information that is generated in terms of whether it is *syntactic* or *semantic*. Recall that syntactic refers to the volume of information while semantic refers to the conveyed meaning of the information. Nonaka (1994) strongly suggests that in terms of creating knowledge (or learning), the semantic aspect of information is more relevant because it captures the importance of the information which is generated. In other words, information which is perceived as being more useful or influential is likely to promote more organizational learning. The above discussion is formally stated in the following two propositions.

FIGURE 1
Conceptual Model



P_1: In high-technology purchase situations, greater search for internal information will lead to more double-loop organizational learning. Moreover, semantic information will have more impact than syntactic information on organizational learning.

P_2: In high-technology purchase situations, greater search for external market-based information will lead to more double-loop organizational learning. Moreover, semantic information will have more impact than syntactic information on organizational learning.

Proposition 3: Internal information search and external information search

The section revolves around two questions. First, what theoretical justification is there for proposing that internal information search is likely to precede external information search? Second, are internal search processes related to external search processes?

The claim that firms are likely to start the information search process internally is based on two reasons. First, Cyert and March (1992) argue that when firms are faced with a problem such as buying new technology, they will usually invoke the "neighborhood-of-symptom" rule. That is, they are likely to start the search process in the neighborhood of the problem. By doing this, a firm should be able to more clearly understand the nature and extent of the problem before it starts its search for a possible solution in the external environment. Second, all the simple phase/task models of organizational buyer behavior (e.g., Robinson, Faris, and Wind 1967) propose that the stages related to problem (or needs) definition, and description of the needed products, precede the decision stages which relate to external search.

Turning to the second question, the basic premise is that firms who engage in large amounts of internal search activity are also more likely to engage in extensive external information search. Why is this likely to be the case? The argument for this stance is based on the assumption that as the number of departments whose views are sought out increases, the number of additional problems/issues/questions is likely to increase. This is because individuals in different departments, such as sales, and human resources, are likely to have different requirements with respect to the proposed new technology. In order to seek out satisfactory answers to these additional questions, it seems reasonable to expect that more extensive external search about possible suppliers and their products will be required. Accordingly, it is proposed that:

P_3: In high-technology purchase situations, greater internal information search will lead to increased external information search.

Propositions 4 and 5: Effects of technical consultants on internal and external information search

Slater and Narver (1995) argue that executives, who wish to avoid the *adaptive learning* trap, must ensure that their networks include people with different perspectives from those who are dominant in the organization. In high-technology purchase situations, an increasingly important way for executives to extend their personal networks and, at the same time to learn vicariously, is to hire outside consultants who specialise in the problem area under consideration. Since these external experts specialise in the focal area, they can provide relevant tacit knowledge and explicit knowledge and so promote vicarious learning. Accordingly, the hiring of a consultant can be viewed as part of a firm's search strategy (Levinthal and March

1981). Taking this view, it is argued that consultants will have a profound affect on both external and internal information search processes.

With respect to external information search, it is proposed that the participation of consultants will affect three dimensions of a firm's search strategy, namely: (1) consideration and choice set structure; (2) the amount of syntactic external information; and (3) the amount of semantic external information. In turn, we will now discuss each of these three dimensions.

First, the concepts of *consideration set* and *choice set* relate to the fact that many firms often use a two-phase search process when making important purchasing decisions. Initially, a buyer will narrow the total number of possible suppliers down to a list which meets his/her organization's goals and/or capacity to process information. This initial list of suppliers can be termed the "consideration set". At this point, a buyer then collects more detailed information on each supplier rather than look for new alternatives (Cyert, Simon, and Trow 1956). Based on the information obtained from this second, more extended search phase, a buyer will then select a smaller set of acceptable suppliers. This final set of suppliers is termed the "choice set" (Kotler 1997). Though no literature could be found which has focused on the effects of consultants on consideration set structure, two recent studies in high-technology purchase situations have examined the effects that such experts have on choice set structure. The first study (Dawes 1996) showed that consultants increased the size of the choice set while the later study (Patterson and Dawes 1999) not only confirmed this finding, but also showed that consultants affected the composition of the choice set by increasing the number of new or out-suppliers. Though no study has examined the effects of consultants on the structure of the consideration set, it is proposed that they will influence the structure of the consideration set in a similar way that they influence the structure of choice set. This seems a reasonable assumption because, as argued by Dawes (1996), technical consultants are experts in buying technological products and are therefore likely to consider more suppliers initially and later on in the buying process when the choice set is formed. This argument was based mainly on the work of Alba and Hutchinson (1987) who found that there are often significant differences between novices and experts in the size of the set of the alternatives that they consider when making purchasing decisions. A prime reason for this is that novice buyers are aware of many protypical brands but relatively few atypical brands. In contrast, expert buyers, such as consultants, are aware of both brand types.

In terms of the second dimension, the basic premise is that greater consultant participation in the decision-making process will lead to an increase in the volume of external information. This viewpoint is predicated on findings from three empirical studies on how consultants can affect external search processes. The first finding relates to the amount of participation that consultants have in the various stages of the buying process for high-technology products. Results from two of these studies (Dawes 1996; Dawes, Patterson, and Midgley 1997) clearly show that, in general, consultants are highly involved in external information search processes. Therefore, it seems reasonable to assume that greater consultant participation will lead to an increase in the volume of external information generated. The second finding relates to the impact that the consultants have on the structure of the choice set. As noted, two recent empirical studies (Dawes 1996; Patterson and Dawes 1999) show that consultants increase the size of the choice set and influence the composition of the choice set by increasing the number of new suppliers. The net effect of increasing the

number of suppliers considered and, the strong likelihood that some of these will be new suppliers, will be an increase in the volume of external information. This is mainly because in this situation, the firm will need to do a lot of primary research to investigate the capabilities of the new suppliers. In contrast, if buying centre members only consider existing suppliers, they are likely to restrict their search of vendors and their products to internal documents (e.g., vendor performance analyses) generated by the purchasing department.

Thirdly, it is proposed that as the participation of the consultants increases, a greater amount of semantic external information will be generated. This seems likely to be the case because of the consultants' prior knowledge and expertise regarding the technology under consideration. This prior knowledge, both tacit and explicit, can be transferred to members of the buying centre so that they can better understand which pieces of information about the vendors and their products are most useful in helping the firm to select the most appropriate alternative. Based on the above theory, empirical evidence, and arguments, the following proposition is offered.

> P_4: In high-technology purchase situations, greater participation by outside consultants will lead to: (1) greater consideration/choice set size, (2) more new suppliers being considered, (3) a greater amount of syntactic external information, and (4) a greater amount of semantic external information.

With respect to internal information search, no studies could be located that had explicitly examined the effect that consultants have on the number or types of information sources that are used in internal search processes. However, results from two studies (Dawes 1996; Dawes, Patterson, and Midgley 1997) show that consultants, on average, are highly involved in the initial stage of the buying process namely, *fact finding about organizational needs*. As the label suggests, this first stage concerns buying centre members seeking out the needs and opinions of organizational members who are likely to be affected by the purchase of the new technology. In the research presented here, "internal information search" and "fact finding about organizational needs" are treated as being identical processes.

In short, it is expected that greater participation by consultants will lead to a greater volume of internal information being generated as well as a greater amount of semantic internal information. This viewpoint is based on the argument that due to the consultants' expertise and amount of prior knowledge, they will not only ask a lot of questions, but they will also ask the most relevant and important questions. Accordingly, it is proposed that:

> P_5: In high-technology purchase situations, greater participation by outside consultants will lead to: (a) a greater amount of syntactic internal information, and (b) a greater amount of semantic internal information.

In addition to the above hypothesized main effects of consultant participation, the literature in related fields such as sales management (Weitz 1981) and group decision support systems (Rao and Jarvenpaa 1991), suggests possible *interaction effects* between consultant participation and buying centre characteristics.

The remaining part of this section discusses these interaction effects by focusing on the interrelationship between consultant participation, buying centre characteristics, and information processing capacity. However, this interrelationship is

likely to be complex because the formation of a group (such as a buying centre) introduces the need to communicate between members, which, in turn may detract from the group's ability to process an increased quantity of information (Rao and Jarvenpaa 1991). In other words, there is competition between a group's *communication needs* and its *information processing needs*. Drawing on communication theory, Rao and Jarvenpaa (1991) argue that the use of different terminologies and jargon by group members will cause "noise" and a loss of information transmitted. Thus, noise would be higher in heterogeneous groups than in homogeneous groups. Hence, in groups comprised of people from disparate backgrounds, there is likely to be increased competition between a group's communication needs and its information processing needs.

Proposition 6: Interaction effects of consultant participation and buying centre heterogeneity on external/internal information search

In an heterogeneous buying centre, which means there is high lateral involvement (i.e., members from many functional areas) and/or high vertical involvement (i.e., members from many levels of the management's hierarchy), a consultant is going to be faced with the issue of trying to accommodate the group's communication and information processing needs. However, as the heterogeneity of a buying centre increases, so does the likelihood of greater conflict between the group members in supplier selection decisions (Sheth 1972). As a consequence, a consultant in a heterogeneous buying centre is likely to be faced with a difficult situation. But, since this conflict will need to be resolved, it is likely that the consultant will be involved in this task. A consultant with previous experience of this situation may, therefore, try to restrict the number of suppliers considered so as to reduce this potential conflict.

Moreover, in heterogeneous buying centres, Rao and Jarvenpaa's theory (1991) predicts that a consultant is likely spend more of his/her time on attempting to satisfy the buying centre's communication needs rather than improving its information processing capacity. Research by Dawes (1996) provided partial support for this theory in high-technology purchase situations. Specifically, he found support for the hypothesis that there would be an interaction effect between consultant participation and *high lateral involvement* which would lead to a decrease in the size of the choice set. However, he also found that there was an interaction effect between consultant participation and *high vertical involvement* which led to an increase in choice set size. This finding was the opposite of what was expected. Two conclusions may be drawn from this unexpected finding.

First, high vertical involvement may not necessarily lead to heterogeneous buying centres because all of its members, irrespective of their hierarchical position, may represent the same functional area. In other words, vertical involvement may not be as important as lateral involvement in determining buying centre heterogeneity. Second, a consultant involved in a buying centre which has a high degree of vertical involvement, may have a contingency script which differs from when he/she is in a buying centre that is characterized by a high degree of lateral involvement. It seems reasonable to speculate that when consultants find themselves in buying centres with more (and higher) levels of management, they feel the need to expand their external information search activities due to the fact senior managers are present. In short, they may think that they have to impress these senior managers with their knowledge and expertise. In addition, the greater number of management levels represented in the buying centre may reflect the greater importance of the purchase to the firm, which

in turn, may lead to a wider search for a suitable supplier. Therefore, the consultant may not try and restrict the number of suppliers shortlisted but, in fact, do the opposite so as to try and ensure that a better decision is made because of its importance to the firm.

The preceding arguments and empirical evidence suggest that for one phase of the search process (i.e., formation of the choice set), there is an interaction effect between consultant participation for both high lateral involvement and high vertical involvement. Though no research has examined interaction effects on consideration set structure, the amount of syntactic external information, or the amount of semantic external information, it is proposed that there will be similar interaction effects. Moreover, it seems reasonable to expect that there will be similar interaction effects with respect to internal search. Accordingly, it is proposed that:

P_{6a}: When lateral involvement is high, there is an interaction effect between consultant participation and lateral involvement that results in: (1) a decrease in the size of the consideration and choice sets, (2) a lesser amount of syntactic external information, and (3) a lesser amount of semantic external information.

P_{6b}: When vertical involvement is high, there is an interaction effect between consultant participation and vertical involvement that results in: (1) an increase in the size of the consideration and choice sets, (2) a greater amount of syntactic external information, and (3) a greater amount of semantic external information.

P_{6c}: When lateral involvement is high, there is an interaction effect between consultant participation and lateral involvement that results in: (1) a lesser amount of syntactic internal information, and (2) a lesser amount of semantic internal information.

P_{6d}: When vertical involvement is high, there is an interaction effect between consultant participation and vertical involvement that results in: (1) a greater amount of syntactic internal information, and (2) a greater amount of semantic internal information.

Proposition 7: Interaction effects of consultant participation and buying centre familiarity on internal/external information search

Bettenhausen and Murnighan (1985) argue that a major factor hindering information processing in newly formed organizational groups is the amount of previous interaction that the members have had with each other. If group members do not know each other very well, they are likely to spend considerable time "getting to know" one another and testing the appropriateness of their scripts. In such situations, Rao and Jarvenpaa's (1991) theory of group decision making predicts that low familiarity will lead to buying centre members spending more time on their group's *communication needs* as opposed to their *information processing needs*. In contrast, in buying centres where there is high familiarity, the group can spend more time on information processing since they know each other well. Thus, buying centres with low familiarity are likely to have less capacity to process a large amount of information as compared to buying centres with high familiarity. So it is predicted that when consultants find themselves in buying centres with low familiarity, they are

likely to try to restrict the number of alternatives considered since this type of buying centre has a lower capacity to process information. Thus, consultants in buying centres with low familiarity are likely to devote more time to satisfying the group's communication needs. This suggests that there is an interaction between consultant involvement and low familiarity for the outcomes of both internal and external information search.

P_{7a}: When buying centre familiarity is low, there is an interaction effect between consultant participation and familiarity that results results in: (1) a decrease in the size of the consideration and choice sets, (2) a lesser amount of syntactic external information, and (3) a lesser amount of semantic external information.

P_{7b}: When buying centre familiarity is low, there is an interaction effect between consultant participation and familiarity that results in: (1) a lesser amount of syntactic internal information, and (2) a lesser amount of semantic internal information.

Proposition 8: Interaction effects of consultant participation and buying centre viscidity on internal/external information search

Recall that the viscidity of an organizational group refers to the extent to which the members of the group represent a cohesive team (Hemphill and Westie 1950). As noted by Venkatesh, Kohli, and Zaltman (1995), highly viscid groups are characterized by mutual trust, respect, and cooperation among members. Since highly viscid groups have such characteristics, it is likely that its members, when faced with making complex organizational decisions, will be able to spend more time on their group's *information processing needs* as opposed to their *communication needs* (Rao and Jarvenpaa 1991).

In contrast, in buying centres where there is low viscidity, it seems reasonable to expect that the group members will need to spend more time on their communication needs in order to try and sort out their individual differences and make the group more harmonious. Thus, buying centres with low viscidity are likely to have a low capacity to process a large amount of information. Moreover, when consultants find themselves in buying centres with low viscidity, they are likely to try to restrict the number of alternative suppliers considered. This is because as the number of alternative suppliers increases, the amount of interpersonal conflict is likely to increase. As argued earlier, a consultant with previous experience of this situation may, therefore, try to restrict the number of suppliers considered so as to reduce this potential conflict. Thus, consultants in buying centres with low viscidity are likely to devote more time to satisfying the group's communication needs. This suggests that there will be interaction effects between consultant involvement and low viscidity for the outcomes of both internal and external information search.

P_{8a}: When buying centre viscidity is low, there is an interaction effect between consultant participation and familiarity that results in: (1) a decrease in the size of the consideration and choice sets, (2) a lesser amount of syntactic external information, and (3) a lesser amount of semantic external information.

P_{8b}: When buying centre viscidity is low, there is an interaction effect between consultant participation and familiarity that results in: (a) a lesser amount of syntactic internal information, and (b) a lesser amount of semantic internal information.

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