# ENVIRONMENTAL ORIENTATION OF MANAGERS IN TWO NORWEGIAN INDUSTRIES: THE CONSTRUCT AND ITS ANTECEDENTS

By

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# CHAPTER 1

# INTRODUCTION

## 1.1 Background and purpose of the study

Business firms are open systems dependent on their environments for survival and success. Firms need supplies of labour, capital, raw materials, information and knowledge from their environments as well as markets willing to buy their products and services. They are affected by actions taken by close competitors, regulations decided upon by public sector agencies, and technological and economic developments beyond their control. This dependence forces managers to devote considerable time and resources to monitoring and interpreting environmental events and developments. Many researchers claim that alignment between organizational strategies, structures and processes on the one hand to environmental demands on the other, is a key to organizational success (e.g. Lawrence and Lorsch, 1967; Hofer and Schendel, 1978; Porter, 1980). Environmental change can create both opportunities and problems for management.

Even a casual observation of managerial behavior indicates that managers spend considerable time and efforts in order to keep up with developments in a wide range of environmental segments. Managers attend research seminars in order to keep up-to date on technological developments pertinent to their firms, they meet with bureaucrats and politicians in order to influence decisions on industrial policies and legislation, they often process large amounts of customer information in order to improve their understanding of markets. Managers in large organizations decide on the establishment of market research departments or even environmental scanning and analysis units which enable them to monitor and gain insight to important parts of their environments. Despite these activities directed towards increased understanding of their environments, managers are frequently taken by surprise by sudden and unanticipated changes in important environmental segments. When such events occur, their possible impacts on the firm as well as how the firm should change its behavior in response to the environmental changes is often ambigous. This indicates that managers' understanding of environmental states and

developments, along with their impact on the organization is less than perfect.

Normatively, arguments has been put forth in favor of increased attention to virtually all environmental segments surrounding business firms. Many management scholars have their own favorite segment along with arguments for the benefits following from increased attention to these. Arguments have been advanced for increased attention to customers, competitors, the public sector, technological develoments, suppliers and many other environmental segments. The normative strategic management litterature typically stress that organizations should monitor and analyze developments in most parts of the organizational environments.

Managers, however, have limited time and cognitive capacity - and the organizational environments are often complex and changing (Simon, 1957; Emery and Trist, 1967). Consequently, managers must decide on which environmental segments to attend to as well as on the intensity with which developments in these segments should be followed. As managers are intendedly rational individuals, this decision is assumed to build on beliefs as to the relative importance of environmental segments to their individual or their organization's goal achievement. Managers who believe customers to be the most important environmental segment will attend to and seriously consider a wide range of customer matters when formulating strategies and making decisions. Managers, however, very seldom hold identical beliefs concerning the relative importance of customers versus competitors, suppliers versus public sector and so on. Research on environmental scanning as well as other litterature on managers' perceptions of organizational environments, indicate that substantial differences exist with regard to how intensively environmental segments are attended to (Hambrick, 1981, 1982; Miles, Snow and Pfeffer, 1974; Starbuck, 1976). This indicates that managers hold different beliefs concerning the relative importance of these segments.

Organizational and strategic management theorists often stress the importance of environmental influences on firm behavior and performance (e.g. Lawrence and Lorsch, 1967; Hofer and Schendel, 1978). It has also often been stressed that environmental influences on firm behavior are mediated by managerial perceptions of the environments.

Typically it is argued that organizations respond to what they perceive and that unnoticed events do not affect organizations' actions and decisions (Weick, 1969; Miles, Snow and Pfeffer, 1974). Surprisingly little, however, is known about how managers distribute their time and cognitive resources across different segments of their environments. Still less is known of **why** some managers believe some environmental segments to be more important to their firms' goal achievement than other managers. Questions such as why do some managers focus more on competition than others are largely unanswered.

This dissertation is an attempt to identify and test the impact of factors influencing the formation of managerial beliefs about the relative importance of a sample of environmental segments.

## 1.2 Perspective

The research perspective used in order to identify and explore the effects of factors influencing managers' perceptions of their environments is a multidisciplinary one. Elements from cognitive psychology, strategy and organizational theory are used in order to develop a model of managers' beliefs concerning the relative importance of different environmental segments. In this dissertation this set of beliefs is called manager's **environmental orientation**. A multidisciplinary perspective is needed because no single discipline covers all factors previously found to influence managers' perceptions of their organizational environments. Cognitive psychology tends to focus on the individuals active construction of reality using previously developed knowledge structures (e.g. Kiesler and Sproull, 1982). This perspective is highly individualistic and often focuses more on characteristics of the perceiver than objective characteristics of the stimulus to be perceived or the social situation in which perception occurs. According to this perspective, each individual manager holds a somewhat unique environmental orientation created by his/her unique information processing history.

It is, however, also believed that managers adapt their environmental orientations in order to create a fit between beliefs of relative importance and objective traits of the

environments surrounding the firm. This perspective raises the question of which characteristics of the firm's environment will affect managers' beliefs. In order to identify dimensions of the environments believed to influence environmental orientation of managers, I have drawn on theory on the relationship between organizations and environments.

Finally, it is believed that environmental orientation of individual managers is partly influenced by idiosyncracies of the firm in which the manager works. The organizational theory and strategic management litteratures have been reviewed in order to identify organizational characteristics assumed to influence how managers perceive the importance of different environments.

## 1.3 Organization of the dissertation

The dissertation starts out with an explication of the concept of environmental orientation. In this section (Chapter 2), I explain the meaning of this construct as well as some of its consequences with regard to effects on information processing activities of the individual manager. In Chapter 3, a model of environmental orientation formation is developed and four propositions relating antecedents to environmental orientation are formulated. These propositions are developed further in Chapter 4 into testable hypotheses. Chapters 5-8 present the design, setting, data collection along with the procedures used for variable construction as well as validation of variables used to test these hypotheses. In Chapter 9 results of the hypothesis tests are presented. In chapter 10 these results are dicussed and interpreted. Chapter 10 closes this dissertation with a discussion of limitations and directions for further research on environmental orientation.

# CHAPTER 2

# CONCEPTUALIZING ENVIRONMENTAL ORIENTATION

Researchers' interest in managerial orientations is not totally new. Research on how managers set priorities among issues, allocate their attention and time and attributes importance to factors assumed to influence goal achievement has been published at least for the past 35 years (e.g. Dearborn and Simon, 1958).

In this chapter I first explicate the exact meaning of the concept **environmental orientation.** After a definition, a basic dimension of environmental orientation - the degree of balance or concentration - is introduced and discussed. In the following section, relationships between environmental orientation and processing of information about environments are specified. Then, previous research on environmental scanning activities of managers is reviewed in order to establish some evidence for differences in environmental orientation across managers. Environmental scanning activities is seen as a reflection of managers environmental orientation since managers are expected to focus their scanning on environmental elements believed to be of importance to goal achievement. Finally, I discuss the stability of managers' environmental orientation. Stability is an important dimension of environmental orientation, because biases in managers' environmental orientation stem partly from the less than perfect updating of cognitive structures as environments change.

## 2.1 Environmental orientation of managers

Environmental orientation of managers is a set of beliefs concerning the relative importance of different environmental elements to the goal achievement of their firm. Two key assumptions underly the concept of environmental orientation. First, in order to perform their functions and to achieve personal and organizational goals, managers must monitor, interpret and act on events originating in several environmental sectors. This

follows directly from accepting that organizations are open systems, highly dependent on their environments for survival. Second, managers have limited time (Mintzberg, 1973; Kurke and Aldrich, 1983; Hickson, 1987) and cognitive processing capacity. These limitations force them to attend selectively to environmental events. Some of this selectivity stems from deliberate and conscious considerations of the relative importance of different environmental segments to personal and organizational goal achievement. These considerations form a set of beliefs about the relative importance of environmental sectors.

Research in attribution theory suggest that individuals spontaneously form beliefs about their environments, and that this tendency is instigated by the individual's outcome dependency on the target domain (Harvey and Weary, 1984: 432-433). Thus, environmental orientations are formed because managers are dependent on their organization's environment for achievement of their goals. The dependency instigates cognitive activities by which managers form beliefs concerning the functioning of the environments. The subset of beliefs regarding the relative importance of different environments is what I term managers' environmental orientation.

## 2.2 Structure and content of environmental orientation

Previous research on organizational environments has conceptualized the environment as consisting of a set of segments (e.g. Duncan, 1972). The segments are populations of individuals or organizations with specific roles relative to the focal organization. This conceptualization will be used throughout this dissertation. Some of the environmental segments frequently considered important in the litterature are customers, competitors, suppliers, regulatory agents and organizations developing technologies of relevance to the focal firms (e.g. Dill, 1958; Duncan, 1972; Pfeffer and Salancik, 1978; Porter, 1980; 1985).

Monitoring each one of these segments could easily capture any manager's time and

cognitive capacity fully. As argued by Porac and Thomas (1990) even complete assessment of competitors is impossible (p. 226). In a similar vein, internal organizational adjustments in response to demands from one environmental segment could easily absorb all free resources in the organization. However, focusing too much on one sector at the expense of neglecting the others exposes the manager and his organization to the danger of ignoring the build-up of threats stemming from change processes outside his field of vision or to the danger of letting opportunities go unexploited. According to strategy theorists, a key managerial task is to balance the demands from several stakeholder groups and to chose how responsive the organization should be to each (Freeman, 1983). Even under relatively low levels of competition, overlooking important external threats and opportunities could threaten the long term survival of the firm. On the other hand , distributing attention and time equally among all environmental sectors would probably create a situation where the manager knows a little of anything external to the firm without excelling in knowledge of any particular sector. One source of superior performance at the organizational level is the capacity to notice and act early on environmental changes. Outperforming competitors at environmental monitoring and interpretation, could give the organization lead time, which in turn often creates first mover advantages (Lieberman and Montgomery, 1988). Superior performance in these functions would probably imply that managers have to focus more intensively on some environmental sectors than their peers in competing firms. Thus, both overly concentrated and overly balanced environmental orientations could produce inferior individual level and organization level attention structures. Apparently, there is no simple answer of how managers should distribute their attention across environmental sectors. Arguments can be made both in favour of a concentrated as well as a balanced environmental orientation.

Further, strong arguments have been made in favour of increasing attention to virtually every environmental segment (Porter, 1980; Freeman, 1983; Day and Wensley, 1988; Loveridge and Pitt, 1990; Smith and Grimm, 1991) . It is likely that both forms of orientation can be found in any industry and that managers with a concentrated environmental orientation will differ with regard to which sector they focus on. Figures 2.1 and 2.2 below illustrate two general forms of environmental orientation.

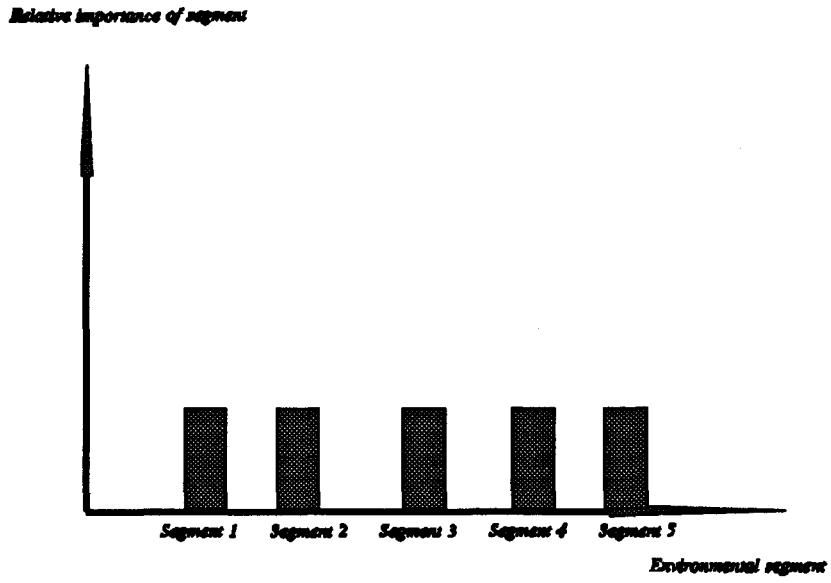



**Figure 2.1 Balanced environmental orientation**

The managers depicted in Figure 2.1 above have a balanced environmental orientation. These managers attribute similar levels of importance to all environmental segments. They assume that all environmental segments can create threats and opportunities for the firm, and should be considered equally important when monitoring the environments, making decisions, solving problems or taking actions. In other words, customers, external technology sector, suppliers and so on are receiving equal attention, and are given equal weight when making important decisions. This form of environmental orientation has been given relatively little attention in the litterature, as most contributions tend to focus on managerial attention towards one or a few environmental sectors such as competitors or customers.

Figure 2.2 below illustrates a general example of concentrated or focused environmental orientation. Managers with such an orientation attribute most importance to one environmental segment, and believe that resources should be devoted to monitoring and understanding this segment. The other parts of the environment are considered less

important, and developments within these segments are not followed as closely. A well known instance of this environmental orientation is managers with a pronounced market orientation. Market orientation implies that customer and competitor sectors are seen as the most important part of the organization's environment, and that most managerial and organizational resources are spent on these sectors (e.g. Kohli and Jaworski, 1990). Other, even more focused environmental orientations described in the litterature are customer orientation (Judd and Tims, 1991) and competitor orientation (Day and Wensley, 1988; Ghosal and Westney ,1991)

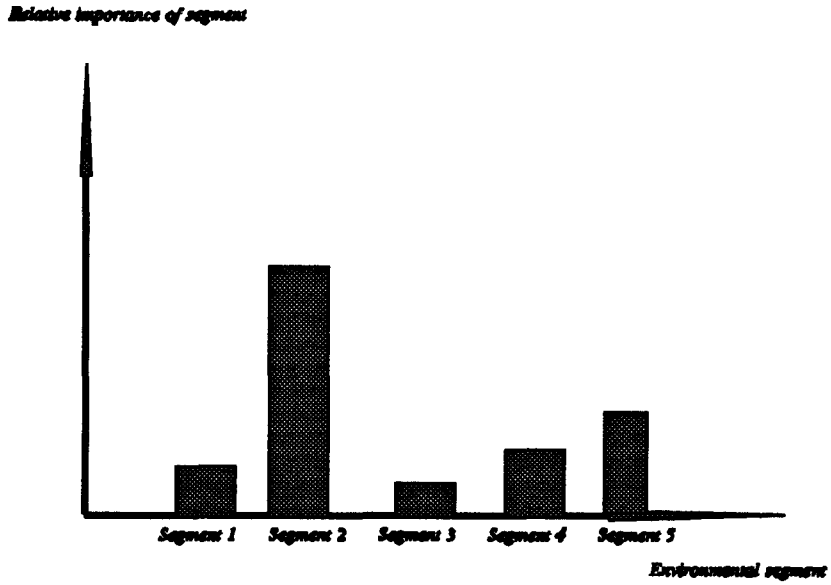



**Figure 2.2 Focused environmental orientation**

The specific locus of attention for the focus of environmental orientation can differ from manager to manager. Thus, one can expect to find customer focused, supplier focused, competitor focused, technology focused, and even public sector focused environmental orientations. Some empirical support for the existence of focused managerial environmental orientations is provided by Aguilar (1967), who found that customers and competitors were by far monitored more intensively than other environmental sectors. Similar results were found by Grønhaug and Lines (1989) in a study of orientations of managers of a bank and of a major industrial firm. Most research to date, however, seem to indicate that managers distribute their attention across several environmental segments

although customers sometimes have been identified as the single most important segment (e.g. Hambrick, 1982; Ungson, James and Spicer, 1985).

These two "pure forms" of environmental orientations should be considered extremes on a continuum ranging from perfectly balanced (all environmental segments have equal importance) to perfectly focused (only one segment is considered important) and most managers are expected to be positioned between these two extreme points. Thus, managers could be characterized by different blends of focus on several environmental segments (e.g. customer and technology orientation, public sector and competitor orientation and so on).

## 2.3 Environmental orientation, cognitive and overt behavior

Managers' environmental orientations - being sets of beliefs - are one form of cognitive structures. Cognitive structures are known to affect both the subsequent basic cognitive processes performed by their possessors (e.g. Neisser, 1976, Kiesler and Sproull, 1982) and the overt behaviors related to information processing (O'Reilly III, 1983). These links are illustrated in Figure 2.3 below.

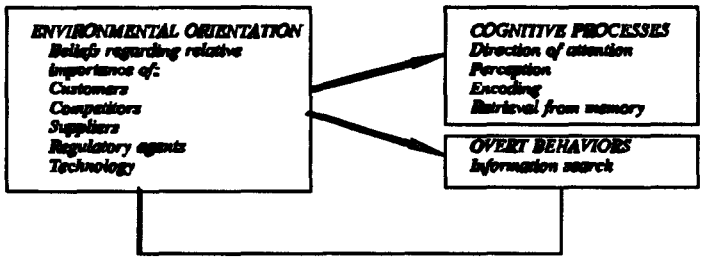



**Figure 2.3 Relationships between environmental orientation and basic cognitive processes**

According to this model, environmental orientation of managers impact on their basic cognitive processes (attention, encoding and retrieval processes) as well as search of information about the organization's environments. The feedback-loop in the figure illustrates that environmental orientation is subjected to continuous change as new experiences are processed and assimilated into the exisiting cognitive structure, or the cognitive structure is accomodated in order to fit qualitatively new experiences (Neisser, 1976; Higgins and Bargh, 1987). However, as will be elaborated later, changes are conservative because of the impact of existing structures on attention, encoding, retrieval and interpretation (see Sherman et al., 1989: 311-313).

In the following the specific mechanisms linking some of these basic cognitive processes

and information search to environmental orientation are explicated.

## The influence of environmental orientation on attention

Managerial environmental orientation's influence on **attention** stems from the idea people tend to attend to dimensions of a situation which is perceived as important to their goal achievement. That is, when beliefs about a domain are formed, people no longer explore new situations from the domain in a totally open minded fashion. Instead, they search actively for information on some dimensions while neglecting information on stimulus attributes perceived as less consequential to their goals (e.g. Markus and Zajonc, 1985). According to this view, when making a decision, or simply monitoring the environments as part of the daily activities, managerial attention will be directed towards environmental segments believed to be important to individual and/or organizational goal achievement.

## Environmental orientation, encoding and retrieval

The relationship between environmental orientation and **encoding** follows closely from the pre-encoding direction of attention. By encoding is meant the process by which external stimuli, e.g. a competitor is transformed into and internal representation (Fiske and Taylor, 1991: 245). The direction of attention towards specific parts of the environmental domain determines which information **can** be encoded. If no attentional resources are spent on one or several environmental sectors, information from these sectors will not be picked up and entered into the working memory. Some authors even believe that the process of encoding external stimuli itself contributes to focusing of subsequent attention on the stimulus which was encoded.

The effect of environmental orientation on **retrieval** from the long term memory store (recall) is caused by a process involving differential salience of stored cognitive structures and the effect of salience on availability (e.g. Markus and Zajonc, 1985). Some cognitive

structures are more salient than others. Enhanced salience has been found to be produced by many properties of both stimulus and the perceiver (e.g. Fiske and Taylor, 1991). One of these properties, likely to produce a link between environmental orientation and retrieval from memory, is the perceived goal-relevance of stimulus dimensions to the perceivers goals (see also above: environmental orientation and attention). So the causal mechanism creating the relationship between environmental orientation and salience is similar to the one producing a link to attention. Salient cognitive structures are more easily retrieved from memory than less salient ones. As an individual manager's environmental orientation represents his/her beliefs regarding the relative importance of different segments to goal achivement, it affects retrieval of knowledge concerning the environments. A different mechanism with similar predictions is indicated by cognitive dissonance theory (Festinger, 1957). According to this theory, when an individual is exposed to information inconsistent with prior beliefs this creates cognitive dissonance, which is a **negative state drive**. Negative states drive the individual to reduce it whenever it is aroused. One important way of reducing cognitive dissonance aroused by belief-inconsitent information is to search the memory for belief consistent information. This works, because cognitive dissonance can be reduced by the addition of new consonant cognitions (Frey, 1986). What is retrieved, in turn, affects the content and outcome of higher order cognitive processes such as interpretation and inference making. Thus it is likely that not only the attention directing effect of environmental orientation, but also the effects on encoding and retrieval produces decisions and actions where information processed in order to analyse the situation, develop alternatives and rank order alternatives according to outcome estimates is systematically biased.

## Environmental orientation and information search

Finally, environmental orientation is believed to have a strong influence on **information search.** The active search for information in order to monitor, analyze and forecast the environments of organizations has previously been termed environmental scanning (Aguillar, 1967) and has previously been assumed to constitute a key activity employed in order to respond effectively to changes in the environment (Culnan, 1983). Important dimensions of individual environmental scanning activities are the decisions of what to scan and by which intensity scanning of different parts of the organization's environments should be performed (Lenz and Engledow, 1986a). Environmental scanning activities of managers have been found to include selection of information sources (personal, impersonal, internal, external, Aguilar, 1967) decisions on the degree of formalization of the scanning activities as well as the degree of focus for the activities. Very high degree of formalizaton is implemented through establishment of environmental analysis units (Lenz and Engledow, 1986b), competitor analysis systems (Ghosal and Westney, 1991) marketing research departments, strategic intelligence systems and other organizational structures devoted to gathering, analyzing and disseminating environmental information. The link between managers' environmental orientation and their personal scanning activities is produced because people tend to search for and use information concerning domains they believe are important to their goal achievement. Thus, people generally search for information confirming their prior beliefs concerning what is important in a situation (Festinger, 1957; Frey, 1986). The idea that people search for hypothesis-confirming information has been empirically supported (e.g. Einhorn and Hogarth, 1978; Hastie and Kumar, 1979; Lord et al., 1979; Frey, 1986). As was mentioned in the previous section, people can search their memories for belief-consistent information in order to reduce cognitive dissonance. However, the search for information can also occur outside the cognitive system, e.g. by environmental scanning activities. Managers who believe that the technological developments are important for their firm, will therefore search selectively for information on technology, and the likelihood that they will find instances of technological shifts which confirm - and thus perpetuate - their beliefs is high. A second mechanism producing information search which is consistent with individual environmental orientations is the tendency to use information which is judged to have

predictive utility (Sherman et al., 1989). According to this principle, when selecting information to use for a task, a person determines (implicitly of explicitly) how useful various kinds of information are.

## 2.4 Evidence for individual differences in environmental orientation

The theoretical rationale for expecting individual differences in environmental orientation follows directly from the discussion above. Environmental orientation is a set of beliefs formed by processing experiences concerning various environmental segments. As the experiences on which these beliefs are built must differ from one manager to another, so will the structure of their environmental orientations. Direct empirical evidence for these differences is, however, limited. Below I review the litterature on environmental scanning in order to establish indirect evidence for individual differences in environmental orientation.

Most empirical contributions to the understanding of managerial environmental orientation lack a sufficiently comprehensive conceptualization of the complexity of organizational environments as faced by managers. The majority of studies have focused on one or two environmental segments, and how managers try to cope with these (e.g. Mayer, 1982 - supply for labor; Narver and Slater, 1990; Kohli and Jaworski, 1990; Davis et al., 1991 for customers and competitors; Judd and Tims, 1991 for customers; Linder, 1982; Birnabaum, 1984 and Romanelli, 1985 for regulatory agents). The only research that has studied managerial orientation towards several environmental segments simultaneously, is that on environmental scanning. Environmental scanning has been defined as the process by which individuals learn of events and trends outside their organization (Fahr et al., 1984). As discussed in the previous section, the structure of managers ' environmental scanning activities is assumed be strongly determined by managers' beliefs with regard to the relative importance of environmental sectors. As argued by Smith et al. (1985) and others, the type and content of information managers use reflect managerial priorities (Scott et al., 1981; Quinn and Rohrbaug, 1983). By consequence, environmental scanning activities

will reflect the underlying environmental orientations of managers, and should be considered a valid measure of environmental orientation.

Aguilar (1967), studied environmental scanning activities of 190 US managers during one month. His findings indicated that scanning consistently varied with functional background. Marketing managers were much more concerned with customer and competitor issues (81 % of total scanning activities) than both general managers (55 %) and technical managers (41 %). Technical managers were more oriented towards the technology sector (37 %) than general managers (14 %) and marketing managers (6 %). A major shortcoming for my purpose is that Aguilar did not report variation withing these groups. It is therefore difficult to determine whether these differences should be attributed to differences in goals or tasks across functions, or whether they reflect different environmental orientations. Ritvo, Salipante and Notz (1979) also investigated the relationship between functional affiliation of individual managers and their environmental scanning behavior. As Aguilar did, they found significant differences in environmental scanning by functional areas. Hambrick (1982) studied scanning behavior among 165 managers from three different industries. His findings, indicated substantial inter-industry variation in environmental scanning activities. Managers from the three industries differed considerably with regard to the structure of their scanning behavior (i.e. the relative scanning of different environmental segments). Intra-industry differences, indicated by high standard deviations, were also found among managers from the same industry. Daft, Sormunen and Parks (1988) researched the importance attributed to various sectors of the environments by chief executives in 50 manufacturing companies. Their findings, like the previous, indicate considerable inter-managerial differences in the relative importance attributed to different environmental segments.

Similar intermanagerial differences in commitment to various environmental sectors have been found in research on customer and market orientation. Narver and Slater (1990) found considerable inter-industry and intra-industry differences in both customer and competitor focus. Judd and Tims (1991) found large differences in customer orientation indicated by how frequently customers were mentioned in annual reports of a sample of 227 US industrial companies.

Ungson, James and Spicer (1985), studying the effects on organizations of regulatory agents and other sectors of the environments, measured the relative importance assigned to environmental sectors by managers of 80 firms in two industries. They found significant differences across industries with regard to the relative importance of sectors, as well as considerable intra-industry variation.

Together, these findings indicate that managers differ with regard to their environmental orientations. Differences have been found regarding the relative importance attributed to different environmental sectors. One study (Aguilar, 1967) indicates that customers and competitors are regarded as the most important elements in the organizations environments, consistent with the arguments from marketing. The rest of the results, however, do not indicate that these two sectors consistently are seen as more important than other sectors (regulatory agents, technology, suppliers). The results of Hambrick (1982), Ungson, James and Spicer (1985) as well as Daft, Sormunen and Parks (1988) indicate a more balanced environmental orientation, consistent with arguments from strategic management (e.g. Freeman, 1983) and resource dependence theory (1978) which hold that the firm is dependent on several stakeholder groups beyond its direct control.

## 2.5 Is environmental orientation a stable individual characteristic?

As mentioned above, managerial environmental orientation is subject to change as the individual encounters situations inconsistent with prior beliefs. Highly belief-inconcruent experiences, thus, force the manager to update his/her beliefs so they fit more to his/her experiences. If a manager repeatedly is surprised by technological changes which threatens his firm, he gradually will develop an environmental orientation where more importance is attributed to technology. If this tendency towards change was the only force operating on environmental orientation, it could be questioned whether environmental orientation should be considered a stable trait worth attention for research. Several processes, however, tend to preserve prior beliefs concering the environments, even though environments change. The updating of environmental orientation as these changes occur, is far from perfect. According to Sherman et al., (1989: 311):

> "New information is typically assimilated into existing structures. However, upon occasion the new information may be so discrepant from the existing structures and/or so compelling that accommodation is called for."

Festinger (1957: 131) argued in a similar manner that selective tendencies in information pick-up from the environments, as well as retrieval from memory would diminish as the amount of dissonance between prior beliefs and new information approaches a maximum. In the words of Frey (1986: 44), speaking of cognitive dissonance due to outcomes of decisions:

> "There is a sort of ceiling effect here where, after a given point, the person considers it to be more effective to revise rather than retain his original decision, and therefore prefers information arguing against the original decision".

Thus, there seems to be widespread agreement that most of the time, situations are perceived and interpreted within the frameworks of prior beliefs and other forms of cognitive structures. Information processing is commonly top-down and "theory-driven". Only occasionally will incoming information change (accomodate) existing beliefs. Research subsequent to Festinger's (1957) formulation and later revision (1964) of cognitive dissonance theory has shown that the prospensity to engage in dissonance reducing activities is positively related to whether beliefs or activities have been freely chosen as opposed to forced upon the individual (Zanna and Cooper, 1974; Sogin and Pallak, 1976), the commitment to the belief (Brock and Balloun, 1967; Sweeney and Gruber, 1984), the refutability of belief-inconsitent arguments (Lowin, 1967; Kleinhesselink and Edwards, 1975, Frey, 1981), the amount of information from which to choose (Frey, 1986). Many of these conditions would be present in the context of managerial processing of information concerning their organizations' environments. Although subjected to influences from both within and outside the organization, managers are quite free to form their own beliefs concering the relative importance of environmental sectors. Research on nonrational escalation of commitment to decisions and the beliefs on which they are made, also indicate that managers would be committed to their environmental orientations (Staw, 1976; Staw and Ross, 1978; Bazerman and Giuliano,

1984). Due to the high level of complexity and ambiguity surrounding the organizational environment, manager's arguments in favour of different environmental orientations are relatively easily refutable. Finally, there is a very large amount of information concerning environmental issues from which the manager could chose in order to reduce cognitive dissonance. Festinger (1964) also specifyed a condition under which belief-inconsistent information would tend to be used: when the information is regarded as highly useful for future decisions. However, little empirical research on the effect of perceived usefulness does exist (Frey, 1986). One could argue, however, that perception of usefulness of environmental information is strongly affected by the already existing environmental orientation of managers.

The belief preserving mechanisms discussed above, follow from cognitive dissonance theory. In the following, I point to some other mechanisms by which environmental orientation is preserved.

Preservance mechanisms can operate on any of the basic cognitive processes discussed above, as well as on the overt information search behavior of the individual. As environmental orientation directs attention, the individual manager will attend more to sectors believed to be important. Consequently, he will notice more events of importance in those sectors than in other sectors less central to his environmental orientation. Findings from social cognition (Higgins et al., 1982; Bargh et al., 1986) indicate that frequently encountered stimuli highly influence perception of a target because representations of these stimuli are more accessible than other knowledge. Thus a customer focused manager, because of his attention on customers, will use more knowledge of customers when making judgements or decisions than other managers. A bias towards preserverance of prior beliefs is also likely to occur at the level of encoding of new information. From research on sterotyping it is generally found that people process new information so that it fits into existing stereotypes (Sherman et al., 1989). Finally, research on belief-preserverance indicate that existing beliefs are quite resistant to change, even if the individual is exposed to belief-disconfirming information. A famous study by Lord et al. (1979) showed that after having processed belief-disconfirming information, people were more confident in their beliefs than before. This finding has been explained by a tendency

to process the disconfirming information so that it becomes consistent with prior beliefs. Another explanation proposed is that people, when exposed to disconfirming information, reprocess the information from which the original belief was formed, and in his way strengthen the associative links between information and beliefs (Wyer at al., 1982).

These belief-preserving mechanisms indicate that when first formed, environmental orientation is expected to be quite resistant to change. Even if some evolution is expected due to processing of new experiences, most of these will be assimilated into the existing belief system. Only when exposed to highly discrepant and frequently occuring belief-incongruent experiences, will the basic structure of the belief-system be expected to change.

# CHAPTER 3

## ANTECEDENTS OF MANAGERIAL ENVIRONMENTAL ORIENTATION

The purpose of this chapter is to develop a model of managerial environmental orientation. Variables assumed to influence environmental orientation of managers are identifyed at three levels: i) individual level, ii) organizational level and iii) environmental level.

As has been stated above, a manager's environmental orientation can be seen as the individual's representation of one aspect of the organizational environment: the relative importance of environmental segments. As such, it is related to objective characteristics of that environment as the environment provides managers with the stimuli on which these representations are formed (e.g. Neisser, 1976). Selective perception and other cognitive processes, however, introduce bias between these characteristics and the managers' mental representations of the environments. Further biases are introduced due to influences from idiosyncracies in the organization in which the manager takes part (e.g. Srivastava and Schneider, 1984).

Therefore, in order to understand the structure of managers' environmental orientation it is neccessary to identify and explore the influences of variables from all three levels. The influences of variables from the three levels is illustrated in Figure 1 below.

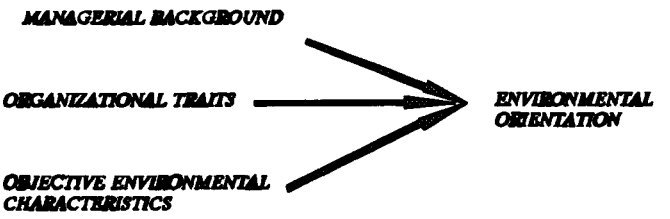



**Figure 3.1. Antecedents of environmental orientation**

This perspective on managerial environmental orientation is related to the interactionist perspective within psychology (Schneider, 1983), which states that in order to understand an individual's cognitions and behavior, it is neccessary to explore both individual and situational attributes. The interactionist perspective was formulated as a conclusion of the dialectical debate between **personologists** who tried to predict behavior as a function of exclusively person traits and **situationists** who concentrated on situational attributes and their correlations to behavior.

In developing a model of environmental orientation formation, I start out with a dicussion of how managerial experience influences environmental orientation. Managerial experience is an important individual attribute that needs to be explored if one is to understand managerial environmental orientation. When considered alone, this attribute belongs to a personologist perspective, but when considered together with organizational and environmental attributes (situationist) it is part of an interactionist perspective on managerial environmental orientation.

In the following section, I discuss how the organization's strategy and the comprehensiveness of the strategy development process relates to environmental orientation of individual managers. In this discussion I argue that the organization's strategy creates the need to focus more on some environmental segments than others, and is thus expected to influence environmental orientation of its managers. Further, I argue that the strategy development process encompasses information processing activities by which managers' assumptions concerning the importance of various environmental segments are modified. The impact on environmental orientation is believed to depend on the comprehensiveness of the strategy process used by the firm.

In the final section of this chapter, I discuss how differences in salient characteristics of the "objective" organizational environment are expected to be related to individual managers environmental orientation.

## 3.1 Individual background and cognition - The management litterature

Although few studies have directly adressed the relationship between managerial background characteristics and cognition, there has been some conceptual and empirical work done ~~done~~ in this domain. Many individual level variables such as personality, cognitive complexity, age and other demographic variables have been identified as influencing subsequent cognitive activities of managers. I have, however, chosen to focus on various forms of **experience**, because experience seems to be the individual level variable which has the most direct relationship to environmental orientation.

### 3.1.1 Managerial Experience and Managerial Cognition

Several researchers have investigated the relationship between various aspects of managers' **experience** and orientations as well as strategies pursued by managers with different experiential backgrounds. Representative for this line of thought, Gupta and Govindarajan (1984) hypothesized that extensive marketing/sales experience would contribute positively to the development of skills in external industry analysis, and hence, would be more effective in implementing a **build** as opposed to a **harvest** strategy. This hypothesis was largely supported in their empirical study.

Dearborne and Simon (1958) studied the relationship between managerial functional affiliation and attribution of causes for a business problem. Their findings indicated that attribution of problems was strongly related to functional background of the managers. In interpreting the results, they suggested that the reason for this finding was the different exposure to information, goals and tasks experienced by managers from different departments. This departmental bias hypothesis was later tested by Walsh (1988) who also found some correlation between functional affiliation and problem conceptualization.

Hambrick and Mason (1984) in a conceptual paper, delineated several managerial background characteristics which they believed would affect noticing of environmental events, information processing and strategic choice in organizations. The mechanism

which tied managerial characteristics to strategic choice was believed to be the effect of managers' backgrounds on their field of vision, selective perception, interpretation and value-mediated choice. Although the authors recognized that ideally the cognitive elements included in the models should be measured directly, they argued that the structures were closely related to observable managerial characteristics such as age, variety of career experience. formal education and functional tracks. Most of the characteristics believed by these authors to influence managerial cognition are related to experience of the managers. Age has previously been used has a proxy for amount of managerial experience (Schmidt, Hunter and Outerbridge, 1986; McEnrue, 1988), functional track and formal education are indicators of the specific content of experiences managers have been exposed to.

In a paper discussing antecedents of executive perceptual filters, Starbuck and Milliken (1988) argued that filtering of information would be dependent on "people's habits, their beliefs about what is and their beliefs about what ought to be." (p. 46). These beliefs, in turn, were thought to depend on the particular experiences of individual managers. In particular, these authors argued that work experience determines which phenomena managers see as relevant or insignificant.

Several researchers have been concerned with how managers differ with respect to their perception of environmental uncertainty (Lawrence and Lorsch, 1967; Duncan, 1972 and others). Since Lawrence and Lorsch's (1967) and Thompson's (1967) pioneering work in organizational theory, reduction of external uncertainty and the sheltering of the organization's technological core through scanning and design of administrative mechanisms have become accepted as key managerial tasks. Subsequent research has revealed that managers differ with regard to their perception of environmental uncertainty (e.g. Duncan, 1972). Similar environments are perceived as stable and predictable by some managers, while some of their peers may characterize the same environments as turbulent, uncertain or changing. Downey, Hellriegel and Slocum (1977) hypothesized that variety of job experience would be negatively related to perceived uncertainty. The rationale for this was that an increase in behavioral repertoire would increase the managers' ability to cope with environmental change. The authors, however, did not find empirical support for this hypothesis.

Ireland et al. (1987) investigated differences in managers' perceptions of organizational strengths and weaknesses. In line with the arguments from cognitive psychology, they argued that variation in managers' perceptions would reflect variation in experiences between managers. Experience in their view would be strongly correlated to managerial level in a given organization. They presented several arguments in favour of this point of view. First, they argued, managerial level may be regarded as a proxy for tasks to be performed, problems encountered and so on. Managers gain experience through solving problems and performing tasks. Given the similar nature of problems and tasks within a managerial level, they expected that within-level variation in perceptions would be less than between level variation. Second, managers holding positions at the same hierarchical level are expected to be of roughly the same age. This, the authors believed, would produce cohort effects, as the managers within one level would have been exposed to similar life experiences and have resultant similarities in values and beliefs. The hypothesized relationship between managerial level and perceptions of strengths and weaknesses was strongly supported by their empircal test.

Although more concerned with conative rather than cognitive effects of managers' background, a study by Song (1982) is judged relevant for this review. This author demonstrated that the background and prior experience of the incumbent CEO in each firm was significantly associated with the degree of diversifaction of a firm. In Song's interpretation, this association was the outcome of the distinctive managerial competencies built through experience from given functional areas.

In a conceptual paper, Schwenck (1988) developed two hypotheses relating mangers' background to their cognitions. First, he argued that managers who have been predominantly successfull in previous decisions would tend to rely strongly on reasoning by analogy when encountering new situations. This would imply that mental models developed previously would be applied to new problems without much modification. Unsuccessful managers on the other hand, would approach a new task more exploratively, and would be more sensitive to differences from previously encountered situations. If this holds, one might expect unsuccessfull managers to accomodate their mental models to the new problem, rather than assimilating information into existing model structures. Second,

he believed that managers' personal experiences and industry experience would affect information attended to and mental models selected in order to interpret the new situation.

Szilagyi jr. and Schweiger (1984), argued that managers can be represented by a set of personal attributes of which education, family background, personality, needs and intelligence were considered the most important. These attributes would translate into a set of managerial skills and behaviors (e.g. specific industry knowledge) which in turn determine the priorities an individual manager will attach to various organizational problems.

In a study relating organizational level strategic orientation to characteristics of upper management, Chaganti and Sambharya (1987) recently found that the orientations of three major American tobacco companies were strongly associated with the proportion of executives recruited from the outside, and the proportion of executives from different functional backgrounds.

Boland jr. et al. (1990) studying the process of problem reformulation after the subjects have been provided with additional data, found that experienced managers reformulated problems as frequently as inexperienced students. One difference, however, was that the managers contained their reformulations within their initial set of problem types. Students explored a much broader problem space when reformulating the problems.

Lai (1991) in her study of students' and managers' problem finding behavior, found indications that managers exhibited higher problem sensitivity than student subjects. With regard to locus of attention, it was found that executives had a stronger internal locus of attention than students. In her interpretation, she identified executives' experience as accounting for these differences (p. 91).

Smith et al. (1991) argued that managers' education and experience would affect several aspects of their organizations' response to competitive moves. Although the study measured conative responses, the theoretical rationale behind the associations is clearly of a cognitive character. They argued that highly educated managers will conduct more

exhaustive information searches in order to detect and assess the impact of competitors' moves than less experienced managers. Highly experienced managers were believed to employ less exhaustive search procedures because they could rely on accumulated knowledge and previously developed action procedures for coping with competitors' actions. Inexperienced managers, lacking this knowledge base were expected to engage in extensive information search in order to develop understanding of the competitor's move.

The findings and propositions reviewed above are summarized in Table 3.1.

**Table 3.1 Summary of research on relationships between managerial characteristics and managerial cognitions**

| Domain | Cognitive process | Trait | Hypothesized effect | Findings1) | Source |
|---|---|---|---|---|---|
| Attribution of problem cause | Problem conceptualization | Experience/functional affiliation | Limited/biased search | + | Dearborn and Simon (1958) |
| Choice of Strategy | Choice | Personality | Association | + | Miller and Toulouse (1984) |
| Elevator problem | Problem conceptualization | Personality | Association | + | Herden and Lyles (1981) |
| Implementation of strategy | N.a. | Experience | Association | + | Gupta and Govindaraj an (1984) |
| Decision-making | Attention, perception, interpretation, choice | Age, experience, education, functional track | Association | n.a. | Hambrick and Mason (1984) |
| Perception of environmental uncertainty | Perception | Variety of job experience | Negative association | 0 | Downey, Hellriegel and Slocum (1977) |
| Organizational strengths and weaknesses | Perception | Experience | Association | + | Ireland et al. (1987) |
| Choice of Strategy | Choice | Functional experience | Association | + | Song (1982) |

| | | | | | |
|---|---|---|---|---|---|
| Strategy formulation | Problem solving, attention, perception | Experience | Association | n.a. | Schwenck (1988) |
| Environmental and organizational problems | Prioritation of topics | Education, family background, personality, needs, intelligence | Association | n.a. | Szilagyi jr. and Schweiger (1984) |
| N.a. | Problem reformulation | Experience | None/explorato ry | + | Boland jr et al. (1990) |
| N.a. | Problem conceptualization | Experience | None/explorato ry | + | Lai (1991) |
| Reaction to competitor moves | Information search | Education and experience | Association | + | Smith (1991) |
| N.a. | Causal attribution | Functional background | Association | + | Walsh (1988) |

1): N.a. indicates that the content of the colomn is not applicable for this contribution.

As indicated in the table, managerial experience is one of the individual background characteristics that have most frequently been hypothesized to affect cognitions of managers. Several forms of experience have been researched. The most popular experience indicators applied in this line of work have been functional track or affiliation (Dearborn and Simon, 1958; Song, 1982; Hambrick and Mason, 1984; Chaganti and Sambharya, 1987; Walsh, 1988), various forms of job experience (Downey, Hellriegel and Slocum, 1977; Gupta and Govindarajan, 1984; Hambrick and Mason, 1984; Starbuck and Milliken, 1988; Ireland et al., 1987; Schwenck, 1988; Boland et al., 1990; Lai, 1991; Smith, 1991) and education (Hambrick and Mason, 1984; Szilagyi and Schweiger, 1984, Smith, 1991). These forms of experience have generally been found to be associated with a wide range of subsequent cognitive processes such as conceptualization of problems and causal attribution (Dearborn and Simon, 1958; Walsh, 1988; Lai, 1991), perception (Ireland et al., 1987), problem reformulation in response to new information (Boland et al., 1991), information search (Smith, 1991) and choice among alternatives. Although not empirically supported, theoretical arguments have also been made in favour of an association between experience and subsequent distribution of attention (Hambrick and Mason, 1984; Starbuck

and Milliken, 1988; Schwenck, 1988).

### 3.1.2 Managerial experience and environmental orientation

As indicated in the review above, the association between managerial experience and environmental orientation has neither been previously explicated theoretically nor empirically explored. In this section I establish a theoretical link between the two constructs.

The **origins** of belief structures such as environmental orientation have been subjected to less research than their structure, content and consequences (e.g. Higgins and Bargh, 1987). It is, however, generally assumed that these belief structures derive from past experiences with instances of the situations which they represent. When an individual encounters a new situation, information from that situation is processed to form mental representations of it. Over time the individual engages in a continuous **perceptual cycle** (Neisser, 1976), where previous experience stored in the form of beliefs directs attention and perception, and where these representations of the object or situation are updated so as to assimilate or accommodate the new information. Through selective attention, selective perception, selective retrieval of information from memory and interpretation within the frame of existing beliefs, the individual actively **constructs** his reality, rather than taking it as given. At the minimum, then, some form of experience from a domain is neccessary in order to form beliefs concerning that domain (Kelley and Michela, 1980).

Most managers have some form of experience from most environmental sectors, and in order to explain why managers differ with regard to their environmental orientations, we must turn to differences in their experiences from the environmental segments.

All mental representations are not equally **accessible** to the individual for use in the processing of new experiences. By accessibility is meant the ease with which instances of a given type can be brought to mind. The accessibility of beliefs have been shown to influence people's estimate of causality, importance, frequency or probability of the

general event or object to which the instance is perceived to belong (e.g. Tversky and Kahneman, 1973). The more accessible the representations are, the higher is also the likelihood of using the representations in subsequent situations. Highly accessible representations have by consequence a high impact on the structure of managerial environmental orientation. Accessibility, in turn, has been found to depend on the **frequency** with which the individual has used the beliefs to process new stimuli (Higgins et al. ,1982; 1985; Wyer and Srull, 1986) as well as the level of belief **salience** (e.g. Reyes et al., 1980; Fiske and Taylor, 1991). A high level of frequency of belief use can be produced by constancies in the individual's environment which call for a particular form of reasoning. This mechanism could provide an explanation of the findings that functional track of managers tend to influence their pattern of causal attributions (Dearborn and Simon, 1958; Walsh, 1988). Managers from different functions use different sets of beliefs when performing their day to day work. Marketing managers are frequently forced to use their beliefs concerning customers' behavior and preferences; R&D managers contineously use their beliefs concerning technological developments and their impacts on the organization. Education is believed to have a similar effect on belief accessibility. During formal education the individual is exposed to systematic information concerning specific domains. The individual is highly motivated to process this information and motivation has been found to be positively associated with belief formation and change (e.g. Chaiken and Stangor, 1987). This intensive and selective exposure to information is likely to produce differences in belief accessibility between managers having different educational backgrounds. It can also be argued that because education typically precedes other experiences relevant for forming beliefs about the organizational environments, it will have an enduring effect on the individual's environmental orientation due to its impact on subsequent cognitive activities.

A high level of belief salience can be produced by several mechanisms. Belief salience has been found to depend on the vividness of the original experience which produced the belief. As argued by Tversky and Kahneman (1974) direct experience with an event makes beliefs concerning the event more salient and accessible to the decision maker with the concesquence that the individual's estimates of its frequency and causal impact is likely to be exagerated. Thus, it can be expected that managers with more direct experience from

one or several environmental segments are more likely to subsequently focus on those segments. Such differential direct experience from public sector, customers, competitors and so on may stem from different functional backgrounds, but also from other differences in job experiences. It is the specific content of managers' experience which is assumed to explain variations in environmental orientation. Thus, managers with an educational background where the program stressed the importance of technology and its impact on business and society, are likely to have more accessible beliefs concerning the importance of technology. Consequently, their environmental orientations will be more focused towards technology than orientations of managers with educational backgrounds where that sector was less emphasized. Several forms of job experience, however could also produce such a segment-focused environmental orientation. For example managers who in the past have experienced important interventions by the public sector, such as deregulation, anti-trust enforcements or pollution control would have more accessible beliefs concerning the importance of public sector than managers without this experience. The total volume of experiences concerning a given sector will positively influence the focus towards that sector of the environment. Sector focus is, however also influenced by type of experience, as direct personal experience is more salient than information about other people's experiences. Based on the previous discussion, the following proposition is expected to hold:

**P1: Environmental orientation of managers covary with differences in amount and type of experiences concerning environmental segments.**

## 3.2 Environmental orientation and organizational characteristics

An organization represents a rich context asserting a wide range of influences on its members' cognitions and behaviors. Organizational structures determine patterns of interactions between organizational members and between members and various segments of the organizational environment. Formal information systems, reporting routines, decision making structures, hierarchies and division of labor affect who gets in contact with whom, and the flow of influence and information in the organization.

In this section I will review some research on the relationship between organizational characteristics and managers' cognitions. I argue that organizational strategy content and process comprehensivenes are among the most important organizational features affecting the environmental orientation of individual managers. Consequently, after a brief review of other characteristics the discussion will focus on the relationship between strategy and environmental orientation.

Many organizational characteristics have been assumed to influence the members' cognitions as well as their behaviors. Here, however, I will focus on research on the relationship between organizational dimensions and cognition.

Miller (1987) studied the relationship between various structural parameters and three aspects of strategy making processes in 97 US firms. His study is considered relevant here, because he set out to disentangle the effects of organizational structure on rationality in the strategy making process in organizations. Important elements of his rationality measure were comprehensiveness of scanning the external environments for problems and opportunities, as well as comprehensiveness in the way the strategically relevant information was analyzed by managers involved in the process. More specifically, he argued that formal integration of departments by means of liason roles would increase the rationality of the process. Liason devices, he believed, would encourage attempts to develop and scrutinize perspectives on the organization and its environments. In the same vein, centralization of power was expected to be negatively associated with rationality in the strategy making process. His findings strongly supported the hypotheses that these

structural dimensions are associated with rationality in the strategy process.

Hall and Saias (1980), discussing the relationship between structure and strategy, noted that decentralized organizations have the capacity to note and respond rapidly to events, while bureaucratic structures restrict both the perceptual ability of the organization and the speed of information flow within it. Although their focus was on relationships between structure and organizational-level information processing, some of the hypothesized effects were believed to be the outcome of relationships between structure and individual-level cognition. For example, bureaucratic structures were believed to reduce the individuals' ability to view the organization as an integrated whole and to see the dependency between sub units.

Dutton (1990), studying the relationship between the organizational context and the interpretation of strategic issues, argued that the organization's information processing capacity, the organizational paradigm, and the organization's current agenda were of special importance in understanding differences in organizations' interpretation of the same strategic issues. The information processing capacity of an organization was seen by this author as the outcome of processes such as participation and interpersonal interaction (which are antidotes to formalization), which are known to vary among organizations (e.g. Lawrence and Lorsch, 1967). Participation and interaction among individuals have previously been shown to affect the information processing capacity of top management (Thomas and McDaniel, 1990). High information processing capacity in turn makes it possible for management to attend to more dimensions of a situation and to consider each dimension more fully in the interpretation of that situation. Dutton defined organizational paradigms in line with Johnson (1988) as the set of beliefs about the organization and the way it is or should be (1990:17). Defined in this way, it includes shared beliefs about what markets the organization is operating in and how it operates in these markets, assumptions about the environment and general beliefs about the distinctive attributes of the organization.

Organizational paradigms have two different effects on the processing of strategic issues. First, it affects which issues are seen as relevant or legitimate, and thus are attended to by

the organizational members. Second, it affects the way in which the stimuli are interpreted (Srivastava and Schneider, 1984; Milliken, 1990). Finally, Dutton (1988; 1990) held that organization have distinct agenda structures. The agenda structure characterizes the array of issues considered as legitimate concerns for the organizational members. The array of issues considered legitimate, in turn orient organizational members' attention. Each issue defines a different subset of information as relevant and important for the organization (Dutton and Duncan, 1987:104).

Pfeffer and Salancik (1978) point to several dimensions of an organization's information system that affect the attention of its members. In their view, the fact that some information is regularly collected focuses the organization's attention on this type of information and gives the members the impression that it is important. Second, they argue that the organization's structure, in terms of configuration of subunits, affects its attention. Subunits will tend to try showing that their particular segment of the environment is important to the organization at large. One way of doing this is through collecting and disseminating information which enhances their own power and prestige relative to other departments in the organization. Organizational members', and particularly top management's, orientation is therefore affected by distribution of power, interaction patterns and information channels existing within the organization.

Beyer (1981) in her review of organizational values, ideologies and decision-making, identified several organizational dimensions influencing the cognition of its members. The beliefs of top management were assumed to influence orientation, vision and beliefs of subordinates. Other important power centers in the organization - different kinds of professionals - exert a similar influence on organization members orientations and cognitions. Tentative support for the relationship between top management's orientations and organizational members' orientaton is found in the observation that organizations in serious crisis often remove their top managers as a way to erase the dominating ideas (Nystrom and Starbuck, 1984).

Srivastava and Schneider (1984) in their discussion of the concept of organizational frames of reference, argued that patterns of information sharing and social interactions help mold

and blend individual and organizational frames of reference (p 803). Organizational frames of reference were assumed to delineate the organization's domain of inquiry, which in turn define what problems are relevant for the organization.

Milliken (1990) argued that perceived organizational effectiveness, sense of institutional identity and decentralization, would affect how the members perceived environmental changes. High degrees of organizaitonal effectiveness, she believed, would create a sense of invulnerability, so that managers in successful organizations are not likely to interpret environmental changes as threats. For weak environmental signals, she argued that less vigilant monitoring of environments would make changes go unnoticed. An organization's identity, i.e. the degree to which members perceive it to be unique or special, was hypothesized to be negatively related to managers' perception of a change as a threat, and positively related to managers' perceived ability to respond adequatly to the change. Finally, she hypothesized that participatory strategic planning process (dimension of decentralization) would increase the likelihood that an environmental change was noticed by the organization's management. Support for several of these hypotheses was found. After presenting the empirical results she concluded: "the research also suggests that organizational characteristics, as perceived by an organization's managers, may influence their interpretation of environmental changes." (p. 59).

Daft and Weick (1984) in turn, believed that an organization's assumptions about the analyzability of the environment would affect their attention and interpretation of environmental issues. In their view, organizations differ with regard to how analyzable they perceive their environments to be. Without explaining in detail factors influencing this perception, they hypothesized that organizations believing the environments to be analyzable would devote much more resources to gathering and analysing data about the environments. The second organizational dimension of interest to these authors was the intrusiveness of the organizations. Intrusive organizations, as opposed to passive ones, actively search their environment for answers to organizational goal achivement or problems. They do this by engaging in comprehensive data gathering and analyses, whereas passive organizations accept whatever information their environments give them. According to Daft and Weick, organizational size and age would affect their intrusiveness.

Old organizations are liable to take the environments as given. New organizations on the other hand begin their lives as test makers, trying out new things and actively seeking information about their environment. As the organization grows, it is likely to gradually begin to perceive the environment as less threatening and the search will decrease (p. 288).

Hedberg (1981), discussing learning processes in organizations, argued that organizations develope a wide range of attention-directing mechanisms in order to cope with both indivdual level and organizational level limitations in information processing capacities. Among these, he stressed the influence of formal information systems, centralization of decision making authority, standard operation procedures and theories of action.

### 3.3 Strategy

Strategy can be defined as an organization's overall approach to the development and exploitation of competitive strengths. Strategic management builds on several basic assumptions. First, it is assumed that competitive advantage is a result of distinctive competencies which makes the firm unique on dimensions seen as desirable by important stakeholders, usually the firm's customers (e.g Day and Wensley, 1988, Porter, 1985). Second, strategy is seen as the firm's response to opportunities and threats generated by the external environment. Strategic problems, decisions and strategy content are commonly assumed to differ depending on which organizational **level** the construct is applied. At the organizational or corporate level, strategy is concerned with business area scope and the development and exploitation of interrelationships between business units (e.g. Porter, 1985). At this level, it seeks to answer the questions of in which businesses is the company to participate, and how shall synergy be achieved. At the business unit or divisional level, strategy is primarily concerned with how the firm is going to develop competitive advantage within a given business area. At the functional level the main strategic questions focus on how resources shall be used in order to accomplish the efficient implementation of business level strategies. My concern in this thesis is the relationship between business level strategies and environmental orientation.

Several attempts have been made at sorting individual firms into groups based on communalities in their strategies. These efforts have generated typologies of strategies, often believed to be valid across industry settings. A typology is a vehicle for ordering heterogeneous elements into distinct groupings where within group variation on some dimensions is less than across group variation. The use of typologies makes prediction possible when a theory exists which relate the groups to some external property (Miles and Snow, 1978). Although several others exist, the two most frequently used typologies for research in business level strategy are the Porter (1980) typology and the Miles and Snow (1978) typology.

Porter (1980) argued that in any given industry only two generic strategies are viable in the long run. Firms can only pursue a strategy of differentiation or cost leadership if they are to develop or sustain competitiveness. Differentiation implies that the firm tries to develop uniqueness on attributes relevant to customers' evaluation and choice among alternatives. Differentiation will, according to Porter, lead to superior performance if the firm is able to simultaneously avoid escalation of costs. The reason for this is that customers are willing to pay price premiums for the firm's unique offering. Cost leadership is a generic strategy under which the firm tries to become a cost leader at the same time as its offering is maintained at a level comparable to competitors' on dimensions important to buyers. Superior performance is the result of lower costs while prices for the cost leader's products are similar to those obtained by other firms in the industry.

While Porter's (1980) typology classifies firms according to their objectives and strategies towards differentiation and cost reductions, Miles and Snow (1978) use firms' attitudes towards innovation and product-market scope as their prime classification variables. According to these authors, firms differ regarding these two traits. Firms with a relatively narrow product-market scope and which never seriously consider entering new business areas are termed **domain defenders**. Firms aggressively monitoring their environments for new opportunities, and which have an opportunistic stance vis à vis new business areas outside their existing domain are termed **prospectors**. A third strategic type, the **analyzers** are blending the two previous orientations. Analyzers operate within a basic domain, in

which they behave like domain defenders. However, they also monitor their environments for new opportunities, and enter new areas selectively. Most often, analyzers enter new areas when their viability and attractivity has been proven by the early entering prospectors. Firms without a clear strategy on these dimensions are termed **reactors** by Miles and Snow.

### 3.3.1 Strategy content and managerial cognition

One dimension of agreement within the strategy field seems to be that the relationship between the organization and its environments is a fundamental part of the organization's strategy (Hofer and Schendel, 1978; Porter, 1980). Alignment between organizational structures, resources and processes on the one hand to environmental opportunities and threats on the other has been seen as the objective of business strategy. Organizations which have been clever or lucky in this alignment process are often assumed to reach higher levels of performance than less lucky or less clever organizations (e.g. Venkatraman and Grant, 1985; Venkatraman and Prescott, 1990). Several authors have discussed the relationship between organizational strategy and cognition. Ford (1985), in a conceptual contribution, argued that organizational strategy influences the organizational members' attribution by shaping decision makers' orientation toward their environments. In his view, organizations adopting a defender strategy (Miles and Snow, 1978) would tend to attribute performance downturns to external causes. Prospectors, on the other hand, would most likely attribute perfomance variations to internal causes.

More relevant to the present work, Miles and Snow (1978) made several speculations about a given organization's strategy and its management's environmental orientation. In their view, defenders only do limited environmental scanning of any type, and concentrate on improving the efficiency of their organizations' internal activity. Managers in defender firms tend to ignore developments outside of the firm's domain (p 37). According to these authors, defenders restrict their attention to a small number of
events, trends and developments expected to influence the organization. Overall, defenders

allocate small amount of resources to scanning and monitoring external developments. Prospectors on the other hand, monitor a wide range of environmental conditions as part of the implementation of their strategy. This is a necessity in order to locate new areas of opportunity. Analyzers blend the two previous strategies. These firms maintain competitiveness in basic business areas and simultaneously scan their business environment for new products which have gained market acceptance. Consequently analyzers combine the environmental orientations of defenders and prospectors through careful monitoring of both the environments of their basic businesses, and other broader environments for new opportunities.

Chaffée (1985) argued that strategy may be defined as an orienting metaphor or frame of reference that allows the organization and its environment to be understood by its stakeholders (including managers and employees). As such, once decided upon, formed through day-to-day decisions in response to environmental variation or followed up by implementation efforts, it affects how organizational members perceive what is important and what is inconsequential. According to this author an organization's strategy will have impact on which environmental events management will use as contingencies for their resource allocations.

Hambrick (1981) developed theoretical arguments linking power distribution within the firm to the organization's strategy. His argument is that the strategy chosen to compete within a given domain created strategic requirements. Some of these requirements are related to the relevant environmental focus following from the choice of strategy. He hypothesized that the strategic requirement created by a prospector strategy is the need to attend to the output environment - monitoring and adjusting products and markets. For defenders, on the other hand, the strategic requirement is to excel at the throughput task. This requirement was believed to create a need to attend to external developments bearing on the processing or delivery of products and/or services. Hambrick (1981) posits that organizational members coping with strategic requirements will gain power within the organization. For example marketers in prospector organizations will have more power than marketers in defender organizations because they are in a position to cope with strategic requirements through their close interrelationships with customers. Testing several

derived hypotheses in a sample of three industries, Hambrick (1981) found support for the power-coping with strategic requirements hypothesis. He concluded: "With some exceptions, coping with the strategic requirement was positively related to power."(p. 265)

Hambrick (1982), partly building on Miles and Snow's (1978) work, investigated the relationship between organizational strategy and environmental scanning acitivities of upper-level executives. Environmental scanning activities can be viewed as a reflection of the environmental orientation of managers. The amount of scanning indicates the overall importance attributed to the environment. The configuration of scanning constitutes a measure of the relative importance attached to each sector.
Hambrick disagreed with Miles and Snow's contention that defenders do less scanning than prospectors and argued that in order to stay competitive within their domain, defenders had to continuously scan the environments for technological developments affecting the efficiency of their organizations. In his view, the difference in environmental orientation between the strategic types lies in their focus, not the total amount of attention. The empirical results of this study, however, revealed only small differences between scanning activity and organizational strategy. As pointed out by the author himself, weak relationships between strategy and environmental scanning could stem from the fact that the executives in his sample did not think of their organizations as having overall strategies **per se**. He concluded this point by writing that executives cannot be expected to focus scanning to reinforce a strategy of which they are unaware.

Hartman, White and Crino (1986) argued, in a manner similar to Hambrick (1982), that business level strategy would determine the mode used by planners to deal with environmental information. They proposed that planners in defender firms would tend to buffer the organization from environmental information, while prospectors and analyzers, characterized by their openness to new solutions and new business areas, would extend the search for information.

Meyer (1982) studied the impact of hospitals strategy on their ability to anticipate environmental jolts (transient perturbations whose occurences are difficult to foresee and whose impacts on organizations are disruptive and potentially inimical). His findings

indicated a relatively strong relationship between membership in Miles and Snow's typology, and the organizations' ability to foresee the environmental jolt (a doctors' strike). Estimating the relative explanatory power of strategy variables, structure variables, ideological variables and slack variables, he found that strategy was the best predictor of the organizations' anticipation of the environmental jolt.

Huff (1982), in a vein similar to that of Miles and Snow (1978) and Hambrick (1981) argued that an organization's strategy functions as an organizing frame used by the organization when confronting uncertain situations. She uses the analogy of a theory in science, which leads the scientist to focus on certain problems and gathering information of the kind that the theory makes critical.

Simons (1991) demonstrated how managers use management control systems to focus organizational attention on what they perceived to be strategic uncertainties, and thereby guide new strategic initiatives. What are perceived to be strategic uncertainties, in turn are dependent on the organizations intended strategy. Managers were shown to use formal systems as signals to guide information gathering and the search for understanding among organizational members. He found three strategic groups of organizations, each perceiving a different set of strategic uncertainties. Management of firms having realized or aspiring for a low cost position were concerned about ensuring that their firms maintained the capabilities to preempt a technological end-run by competitors. Managers of firms seeking or defending a premium price position through innovation were centering on effects of competitor actions, timing and success of new product roll-outs and withdrawals, changing customer needs, and consideration of appropriate responses to new market opportunities and needs. The third group, managers of firms relying on erecting barriers to entry through marketing, focused on maintaining or increasing market share through the impact of their marketing mix, as well as defending their market shares against attacks from competitors. A fourth group, managers of firms operating in patent protected markets, was found to focus on social, political and technological environments.

Segev (1987) investigated the link between business level strategy and strategy making mode. Strategy making mode was categorized according to a typology developed by

Mintzberg (1973) as entrepreneurial, adaptive or planning. Segev's findings indicated that prospectors were more likely to adopt an entrepreneurial mode than analyzers, and defenders were the less likely to adopt this mode of strategy making. The adaptive mode is characterized by its reactive stance towards the environments. In this study, the compatibility with the adaptive mode was highest for analyzers, followed by defenders and prospectors. The planning mode best described defenders, then analyzers and prospectors.

### 3.3.2 Strategy process dimensions and managerial cognition

A strategy development process is an organizational effort aimed at improving the organization's level of consciousness with regard to its distinctive competencies, the detection of important threats and opportunities originating in the internal and external environments, the formulation of vision and direction for the long term development of the organization and specific functional-level plans for implentation of the strategy. At the very heart of this process is the analysis of environments.

Ford (1985), recognized that an organization's engagement in comprehensive strategy development processes would impact on management's pattern of attributions. He argued that strategy formulation permits decision makers to identify organizatonal strengths and weaknesses, and formulate strategies for managing environments that build on strengths while avoiding weaknesses. Consequently, he argued, when expectations are not met, decision makers look for less understood causes in their environments.

Dutton and Duncan (1987), in one of the few works directly addressing the topic, argued that several aspects of the strategic planning process the organization engages in, affect the set of strategic issues that capture decision makers' attention. At the most general level, they proposed that an organization's strategic planning system would affect form and content of strategic issue array, which in turn triggers initiation and implementation of strategic change. More specifically they hypothezised that planning focus, formality, diversity and intensity will influence which strategic issues are attended to in an

organization. Focus refers to whether the process is largely bottom-up or top-down in its flow of premises, information, suggestions for change an so on (Nutt, 1986). In line with arguments often encountered in the normative strategy formulation and implementation litterature, the authors believed that bottom-up processes would yield a greater diversity in the strategic issue array. With regard to planning formality, they held that higher degrees of planning formality will increase the number of issues retained for further consideration. Planning diversity refers to the diversity of people participating in the planning process, i.e. the planning team's horizontal scope. Dutton and Duncan argued that higher degrees of diversity, where people from different functional departments participate in the process, will increase the number of issues identified as well as their diversity and scope. Finally, they hypothezised that strategic planning intensity, i.e. the level of personal resources participants must devote to the process, increases the scope, but decreases the size of the organization's strategic issue array.

### 3.4 Organization and environmental orientation - summary and propositions

This review of the influences of organizational characteristics on cognitions of individual managers is summarized in Table 3.2 below. Included in the table are the organizational traits explored in a given contribution and which cognitive processes are affected, along with hypothesized effect and findings. For the conceptual contributions "not applicable" is entered in the findings column.

As pointed to in the preceding discussion and indicated in the table, a variety of organizational traits have been assumed to influence the cognitions of organizational members. Among the most frequently used traits for this line of research has been degree of centralization (Pfeffer and Salancik, 1978; Hall and Saias, 1980; Miller, 1987; Dutton, 1990; Milliken, 1990), structure and content of the organization's information system (Pfeffer and Salancik, 1978; Hedberg, 1981), strategy content (Miles and Snow, 1978; Hambrick, 1981; 1982; Huff, 1982; Mayer, 1982; Chaffé, 1985; Hartman, White and Crino, 1986; Segev, 1987 and Simons, 1991) and dimensions of the strategy process in

organizations (Ford, 1985; Dutton and Duncan, 1987). These organizational traits have been assumed to influence attention, perception, belief formation, interpretation and information search behaviors of the organizational members. Most of these studies have been conceptual analyses. The empirical studies identified in this review, however, have found significant associations between organizational traits and the cognition of their members.

**Table 3.2 Summary of research on relationships between organizational characteristics and managerial cognitions.**

| Organizational trait | Cognitive Process | Hypothesized Effect | Findings | Source |
|---|---|---|---|---|
| Integration of departments, centralization of power | Information search, analysis of information | Association | + | Miller (1987) |
| Centralization of power | Attention, perception | Neg. association | n.appl. | Hall and Saias (1980) |
| Centralization, issue agenda, organizational paradigm | Interpretation | Association | n.appl. | Dutton (1990) |
| Information system, structure, centralization | Attention, beliefs of importance | Association | n.appl. | Pfeffer and Salancik (1978) |
| Organizational frames of reference | Attention, problem finding | Association | n.appl. | Srivastava and Schneider (1984) |
| Assumptions about analyzability | Attention, interpretation | Pos. association | + | Daft and Weick (1984) |
| Information systems, centralization, theories of action, SOP's | Attention | Association | n.appl. | Hedberg (1981) |
| Organizational effectiveness, sense of identity, decentralization | Perception | Pos. association | + | Milliken (1990) |
| Strategy | Attention, perception, information search | Association | + | Miles and Snow (1978) |
| Strategy | Attention, interpretation | Association | + | Chaffée (1985) |
| Strategy | Attention, attribution of importance | Association | + | Hambrick (1981) |
| Strategy | Information search | Association | +/0 | Hambrick (1982) |
| Strategy | Openness to environmental information | Association | n.appl. | Hartman, White and Crino (1986) |
| Strategy | Anticipation of environmental change | Association | + | Mayer (1982) |
| Strategy | Interpretation | Association | + | Huff (1982) |

| | | | | |
|---|---|---|---|---|
| Strategy | Perception of strategic uncertainties | Association | + | Simons (1991) |
| Strategy | Rationality in strategy development process | Association | + | Segev (1987) |
| Strategy process | Pattern of attributions | Association | n.appl. | Ford (1985) |
| Strategy process | Attention | Association | n.appl. | Dutton and Duncan (1987) |

### 3.4.1 Strategy and environmental orientation

The influence of strategy on cognitions has a prominent position in this line of research. The mechanism by which strategy relates to environmental orientation, however, has not previously been explicated in detail. In the following, I propose such a mechanism. As has been stated above, the choice of strategy concerns the choice of a specific combination of competitive means such as innovation, adaptation of products to customer needs, cost control and so on. Implementation of the chosen strategy is - at least partly - dependent on input of resources and information from the environment. The importance of different environments in the implementation of the firm's strategy depends on the specific combination of competitive weapons chosen by the firm. In the same manner as the chosen strategy creates a functional importance mix defining the relative importance of functional areas for successful implementation (Hitt, Ireland and Stadter, 1982), it creates an environmental importance mix that defines the relative importance of environmental segments. Firms pursuing a cost leader strategy, must search their environments for resources and information contributing to lower costs. These environments need not be the same as those important for firms pursuing other strategies. Firms less dependent on low cost for competitiveness can reduce their attention towards environmental segments affecting the firm's cost position. The specific environments contributing to lower costs depend in part on the industry in which the firm participates. In some industries, cost reductions stem primarily from technology developments (e.g. Tushman and Anderson, 1986), in others the right combination of suppliers may be the key to lower costs.

Firms pursuing a differentiation strategy need extensive knowledge of customers in order to design and manufacture products which are perceived as superior to their competitors. With other strategies, a focus on the customer sector may be less important to successful implementation. The specific relationships between different strategies and environmental orientations are developed in detail in the next chapter. Based on the litterature review and the discussion above, however, the following proposition is made:

**P2: Environmental orientation of managers will be influenced by their organization's strategy**

### 3.4.2 Strategy development process and environmental orientation

As argued above, an organization's strategy development process is an important means for monitoring and analyzing the organization's environment. During this process, managers are typically released from their day to day activitities, which makes more unpredjudiced assessment of the environments possible. Techniques and analytical models from a variety of fields are used (e.g. Lenz and Engledow, 1986). Some of these techniques are developed specifically to support the processes by which existing beliefs concerning the organization and its environment are challenged. Participation in this process is likely to expose managers to variables not previously considered important and could change their environmental orientation by changing their focus or including new environmental variables. Thus:

**P3: Environmental orientation of managers will be influenced by dimensions of the organization's strategy development process**

## 3.5 Environments and managers' environmental orientation

Although it has been argued previously in this chapter that managers are partly trapped in their own experiential background, and subject to influences from the organizations of which they are part, I do not believe that their environmental orientation is totally detached from a notion of the environment as an ontological entity having an existence irrespective of whether there are managers to perceive it or not.

This perspective on the environments having objective and potentially measurable characteristics, used to be the dominant view within organizational theory and strategy (e.g Lawrence and Lorsch, 1967; Porter, 1980) and is sometimes termed the non-constructivist or situationist perspective. Lawrence and Lorsch (1967), studying relationships between environmental conditions and organizational structure, argued that organizational success requires maintenance of differentiation and intergration consistent with demands of the environment. Typically, they argued, an industry's landscape is characterized by one or two dominant environmental requirements. Although environmental characteristics were tapped using perceptual measures, those characteristics were clearly seen as belonging to the environment rather than construed mentally by the individual. According to Hambrick (1981) such requirements could include technological uncertainty, regulatory demands, raw material shortages or supply-demand imbalances (p. 255). One of the few studies directly supporting the view that managers embedded in different environments perceive the relative importance of environmental segments differently is reported in Ungson, James and Spicer (1985). Studying how the importance of suppliers, competitors, customers regulatory agents and labor was perceived by managers in two industries, they found significant differences across industries.

The argument that individuals, albeit imperfectly, perceive an external reality with considerable precision is so intuitively obvious that the degree of congruence between objective characteristics of events, trends or objects, and an individual's perception of them is seldom the focus for research on managerial cognitions. Researchers studying managerial and organizational behavior from a cognitive perspective have been more interested in biases in managers' cognitive processing than the validity of the mental

representations of external phenomena. As a consequence, there are few works that directly study the relationship between objectively measurable characteristics of the environments and managers' perception of their environments or dimensions thereof. The relationship between an objective world and individuals' mental models of the world is also central to many contributions from cognitive psychology. Neisser (1976), in his model of the perceptual cycle, stresses that although selective attention, perception and interpretation normally occurs, the input to these cognitive processes is provided by the perceiver's environments.

### 3.5.1 Task environments and general environments

Many models of the business environment have introduced a distinction between the firm's immediate environment and a broader, general environment. The immediate environment, often termed the **task environment**, has been defined as those parts of the environment influencing the organization's goal formulation or goal achievement, and hence creates **tasks** which have to be handled by organizational members (Dill, 1958). This definition does not imply that elements of the task environment have to interact directly with the organization e.g. through transactions. Operationally, researchers have included suppliers, customers, regulatory agents and competitors in their delineation of the task environment (e.g. Dastmalchian, 1986; Osborn and Hunt, 1972). Most often, the firm's task environment has been portrayed as consisting of distinct sectors of similar actors. Dill, in his early work on organization-environment interrelationships, defined the firm's task environment as the firm's customers, competitors, suppliers and regulatory agents (1958). More recent contributions have also included a technology sector in the firm's task environments (e.g. Duncan, 1972; Bourgeois, 1980; 1985; Ungson, James and Spicer, 1985). As noted by Bourgeois (1980), the definition of task environments in organizational theory approaches the economists' and business strategists notion of an industry.

A theoretical rationale for inclusion or exclusion of environmental elements in the firm's task environment is, however, not readily apparent in the litterature. The distinction

between a task environment and a general environment should rather be viewed as a heuristic for researchers and managers helping in the identification of the most influential elements of the environment. The general environment, is commonly considered to have less direct influence on firms. Sectors often included in the general environment are political developments, general economic climate, sociocultural and demographic trends. In this study, I follow the tradition in research on organization - environments interrelationships by including the previously mentioned sectors of the task environment in my conceptualization of the organizational environment.

### 3.5.2 Levels of analysis and organization-environment relations

The treatment of organization-environment relationships immediately raises the question of level of analysis. Basically, four perspectives have emerged in the litterature on this topic. The first perspective, found in parts of the business strategy and industrial organization litterature, tends to view the industry as a proxy for the environmental conditions facing the firm (e.g. Dess, Ireland and Hitt, 1990; Hrebiniak and Snow, 1980; Snow and Hrebiniak, 1980). Implicit in this perspective is that incumbents of a given industry face similar environmental conditions, opportunities and constraints. Porter (1980), reflecting this perspective, holds that the profit potential of a firm is largely determined by the industry in which it operates.

The second perspective, emerging in works on interorganizational theory (e.g. Reve and Stern, 1985), strategic network theory (Jarillo, 1988) and transaction cost theory (Williamson, 1985) recognizes the uniqeness of a given firm's environment. Through domain selection, network building, establishment of long term strategic alliences, vertical and horizontal integration, contracting and marketing, the firm creates its own environment which is made up of elements included in a definition of its industry, but may lack some of the distinct features (e.g. level of uncertainty, resource scarcity, heterogenity or even growth) those environments possess at an aggregate level.

A third perspective on organizational environments that accounts for some industry

heterogenity with regard to environmental conditions facing incumbent firms is implied from the notion that an industry is made up of strategic groups. A strategic group is a collection of firms occupying the same industry segment (product-market matrix) and pursuing similar competitive strategies (Porter, 1980). Structural conditions facing the firms in one strategic group (entry and exit barriers, buyer or supplier power etc) may be quite different from conditions facing other strategic groups. Other environmental changes can also affect industry segments differently. According to Dess, Ireland and Hitt (1990) waste disposal legislation (originating in the regulatory sector) has had a much greater detrimental effect on the architectural coatings segment than on the industrial products segment of the US paint and allied products industry (p. 20).

The fourth and most comprehensive perspective goes beyond the single industry environments and holds that industries can be grouped into aggregates based on some underlying communalities. In this vein, Porter (1980) writes about general industry environments such as fragmented, mature and emergent industries generating unique challenges for the incumbent firms.

The four perspectives are all built on sound theoretical reasoning, and should probably be regarded as complementary perspectives on the organization-environment interface. The choice of analytical level with regard to environments must ultimately be based on the research problem or managerial problem to which an analysis of environments should apply.

Obviously, firms in one industry face some communality with regard to supply uncertainty, competitive structure, stability of demand and so on. The ratio between intraindustry and interindustry heterogenity depends on the phenomenon under investigation. Studying performance differences, Rumelt (1991) recently found that industry effects accounted for much less variation than researchers previously have thought. In fact, most dispersions in long-term profit rates were attributed to business-unit effects. Previous studies that attempted to partition variance in performance to industry, corporate and business-unit effects have concluded that industry effects were by far the most powerful predictor of performance (e.g. Schmalensee, 1986). These studies, however,

were critisized by Rumelt on the grounds of not correcting for random fluctuations in industry profitability due to industry-specific, but transient effects. Rumelt's study indicates that, although they somtimes are present, some researchers may have overestimated interindustry differences in performance. More relevant to the present work, several researchers have tried to establish links between industry characteristics and organizational members perceptions of their organizations' environments. Dastmalchian (1986) studied the relationship between organizations' dependency on various environmental sectors and their members' perception of goal centrality. Measuring environmental resource dependency by using a set of objective measures, he found support for the notion that members' goal orientation was significantly related to objective traits of the organization-environment relations. Hrebiniak and Snow (1980), studying managers perceptions of environmental uncertainty across four industries (Plastics/synthetic resins, Semi-conductors, Motor vehicles and Air transportation) found significant differences in the perceived level of uncertainty experienced by managers from different industries. Managers from the motor vehicle and air transportation industries experienced significantly less uncertainty attached to the governmental sector than managers in the two other industries. This difference was interpreted by the authors as reflecting an objectively less dependence on the government sector in this industry. The semi-conductor firms' managers, in turn experienced higher levels of competitor uncertainty. These findings, however, tell little about intra-industry heterogenity in perception of environmental uncertainty. In order to shed light on this issue one can inspect the standard deviations of the uncertainty measures within each industry. Standard deviations range from .48 to 2.51, generally larger than the absolute difference between industry means, indicating considerable intra-industry variation in perception of environmental uncertainty. From this study, it is unfortunately not possible to assess whether intra-industry heterogenity is caused by objective differences in environmental uncertainty between firms or whether differences stem from differences in organizational characteristics (e.g. strategy) or the cognitive structures of the individual perceivers.

The important question of whether an organization's environment should be conceptualized and measured at industry level or organization level, is far from being resolved. The research reviewed above, however, seems to demonstrate the existence of

considerable inter and intra-industrial variations in perception of environmental phenomena.

### 3.5.3 Dimensions of the business environment

Several dimensions have been proposed as important with regard to the business environment. Porter (1980), in his five force framework based on research in industrial economics, proposed that the structural characteristics of the industry represent the salient dimensions of an organization's environments. In his pioneering study, Dill (1958) found that environmental heterogenity, i.e. the degree to which sectors of the task environments are made up of heterogenous elements, was related to managers' decision making autonomy. Emery and Trist (1965) stressed the importance of interconnectedness between elements of the environment. Increased environmental interconnectedness creates dependence on elements far removed from the focal organization. Changes in remote elements affect the organization through long chains of connections between environmental elements. In his review of the organizational environment litterature, Aldrich (1979) identified six environmental dimensions which were considered important by previous researchers (environment capacity, homogenity, stability, concentration, domains consensus and turbulence). In a construct validating study Dess and Beard (1984) found that these six dimensions were adequatly captured in three dimensions: Munificence, dynamism and complexity.

Two views of environmental dimensions have emerged as dominant among scholars doing research on organization-environment relationship from a non-constructivist perspective (Aldrich, 1979). One stream of research views the organization as **dependent on resources** from the environment (e.g. Pfeffer and Salancik, 1978). A major managerial task within this perspective is to create linkages with environmental agents in order to secure the availability of vital resources controlled by outsiders. According to this perspective, the environments are seen as a source of resources. The other dominant perspective views the environment as a source of **uncertainty** creating difficulties because

efficient operation of the organization requires predictability. The major managerial task within this perspective, is assumed to be uncertainty reduction and shielding of the organization's technological core (e.g. Thompson, 1967). The two perspectives are not incompatible. As recognized by both Pfeffer and Salancik (1978) and Daft, Sormunen and Parks (1989) a combination of the two perspectives is more likely to produce a powerful model of environmental sectors and dimensions of importance to organizations. Resource dependency is not really a problem in the absence of uncertainty. If the organization can count on the environments providing it with vital resources, the environment does not need to be controlled or monitored. In the same vein, uncertainty only becomes an important environmental dimension when it concerns factors potentially important to organizational goal achievement. Uncertainty, in the sense of turbulence, may however attract managers' attention regardless of the importance of the change to personal or organizational goal achievement. Environmental change will increase the salience of the elements changing when compared to a background of stable and predictable elements. Thus, frequent changes in the availability of supplies, public policy towards an industry, customer preferences or demand volume, will tend to attract managers attention. All other elements of our model being equal, a totally stable environment would produce environmental orientations where attention is evenly distributed among environmental sectors. In an environment where one element, say the supply of input factors, is subject to frequent change, we would expect to find managers focusing on the supply sector, while allocating less attention to the more stable elements of their business environments. These perspectives also encompass the dimensions found by Dess and Beard (1984). Complexity and dynamism can be seen as parameters forming the overall uncertainty of an organization's environments, whereas munificence is a measure of the resources available to the firm.

### 3.5.4 Influence of environments on environmental orientation

Empirical research within these two (and the combined) perspectives seem to confirm that managers actually behave in concordance with the predictions (e.g. Daft, Sormunen and Parks, 1989). Resource dependence and external uncertainty seem to attract managerial attention, an thus influence their environmental orientation. One measure of mangerial

environmental orientation is how managers choose to compose the boards of their firms. Pfeffer (1972) found that the percentage of attorneys on a board was positively correlated with the level of regulation and representatives from financial intitutions increased with increases in the firm's capital requirements. More generally, he found that the proportion of outside directors was positively related to the level of environmental demands. In a more recent study inspired by the resource dependence perspective, Boyd (1991) investigated the relationship between environmental demands and board composition. His findings were in agreement with theory in that firms experiencing higher levels of external uncertainty used more interlocking members in their boards. Leblebici and Salancik (1981), in a study of loan officers decision making behavior in banks, hypothesised that the level of uncertainty in the environments of the banks would influence several aspects of their loan decision making behavior. Results from an experiment involving 7 hypothetical loan applications administered to 60 banks embedded in environments with differing levels of environmental uncertainty, revealed that uncertainty had a significant effect on information used by the decision makers (p. 591).

In line with these à priori arguments and empirical results, it is expected that managers' environmental orientations will reflect their organizations' dependence on environmental sectors in achieving their goals. Resource dependence alone , however, is not enough to warrant attention from management. In order to influence managers' beliefs concerning the relative importance of their environments, the sectors have to produce uncertainty for the managers.

Thus, stable, simple or homogenous environments are, thus, not expected to attract attention even though they control resources vital to the organization's goal achievement. The following proposition follows from this discussion:

**P4: There is an association between environmental uncertainty and environmental orientation**

# CHAPTER 4

# HYPOTHESES

The purpose of this chapter is to translate the broad propositions from my theory review in the previous chapter into testable hypotheses. The chapter is organized in the same manner as the previous, starting with hypotheses derived from the relationship between individual managers' personal experience and environmental orientation. Next, hypotheses linking business strategy and comprehensiveness of the strategy process to environmental orientation are set forth. Third, hypotheses with regard to the relationships between objective characteristics of the business environments and individual environmental orientations are formulated.

## 4.1 Experience and Environmental Orientation

As was argued above, previous life experience affect how individuals attend to, perceive and interpret present situations. In theory then, most forms of previous experiences could have minor or major impacts on managers' environmental orientation. Of particular importance, however, are experiences closely related to coping with tasks associated with the role as managers. According to Fiske and Taylor (1991), causally relevant cognitive structures are more easily recalled than other information stored in long term memory. Recall, in turn orient attention, information pick-up and further processing when the individual is confronted with a complex situation or task. Causally relevant experiences are assumed to influence the environmental orientation of managers. What is seen as causally relevant experiences is partly a product of the individual's previous and present causal reasoning and inference processes. We cannot know exactly which experiences are seen as causally relevant to the individual manager. Below, however I have tried to identify some broad forms of experiences which are assumed to impact the environmental orientation of managers. I start out with a discussion of the relationship between formal education and environmental orientation. This is a logical starting point because chronologically, formal education is the first experience base professionals can draw on

when they enter the work life. Most recently graduated individuals have little direct experience relevant to understanding and coping with situations encountered in work. They consequently have to rely on mental models developed during formal education in performing their jobs. Then, gradually I build up the model to account for other experiences individuals are exposed to later in their carriers. Finally I speculate about dynamics, i.e. how environmental orientations change over time and the relative impact of different forms of experiences.

### 4.1.1 Formal education and environmental orientation

The role of formal education as a process which systematically shapes values, attitudes and minds of large masses in a society, has always been recognized by sociologists (e.g. Jackman and Muha, 1984; Bidwell and Friedkin, 1988). The effect of education on managers' cognitive structures and processes has also been assumed to be important by management scholars (e.g. Hambrick and Mason, 1984). Little empirical work, however, exists to guide the development of hypotheses linking the two variables. One important exception is Bantel and Jackson's (1989) study from the banking sector. These authors found that executive educational level was associated with organizational innovation. This study, however, focused on organizational outcomes, and the mediating role of managers was only inferred.

In developing my hypotheses, I consider formal education as a special form of experience the individual is exposed to in early phases of his carrier track.
The content of educational programs is hypothesized to influence the environmental orientation of managers. Through formal education, beliefs with regard to the relative importance of elements of the organization and its environments are developed. The students are exposed to daily information about the sectors covered in their programs during a long period of time. In this phase of their lives they have relatively little experience or knowledge which could provide a background to judge the relative importance of the sectors covered in their curricula compared to other environmental sectors. Educational programs differ as to the relative importance devoted to transmitting

beliefs concerning different elements of the environments to students. In some programs, only a few environmental sectors are analysed in the diciplines covered. Fresh student from these educational programs will probably overemphasize these sectors at the cost of deemphasizing other sectors with respect to which they are lay men. Thus the following hypothesis:

**H1: The bias inherent in educational programs will be reflected as biases in managers' environmental orientations**

Other relevant elements of an organization's environment, such as customers, public sector, competition and so on are given much less attention in these programs. Business students are on the other hand, exposed to models of most elements of the business environments during their study. Diciplines such as marketing, strategy, organizational theory, micro- and macro economics provide students with theories, cases and models explaining the functioning and importance of customers, competitors, public sector etc., to the achievement of the firm's goals. In most business school programs, however, the customer sector is given particular attention. A whole discipline, marketing, is devoted to transmission of models of customers and the importance of customers to the firm.

### 4.1.2 Work experience and environmental orientation

Direct work experience has probably a stronger impact on environmental orientation than formal education. It has been proposed that vivid information attract attention and are more available for recall than pallid information (e.g. Fiske and Taylor, 1991). It can be argued that direct experience is more vivid to the individual than information from other individuals' experiences. Research on attitude accessibility also seems to support this, because it has consistently been found that attitudes formed by direct experience with the attitude object (e.g. the organizational environments) are more easily accessible, and have a stronger object-evaluation association than attitudes formed without direct experience with the attitude object (see Chaiken and Stangor, 1987: 586). Information transmitted during formal education often has the character of being other peoples' experiences, whether these people are managers, researchers or politicians. Some forms of personal work experience will probably impact managers' environmental orientations more than others. Situations experienced as directly creating opportunities to higher levels of goal achievement, threats to the organizational goal achievement or experience of bankruptcy would have higher impacts on environmental orientations than trivial, inconsequential experiences. These kinds of experiences are assumed to create motivation to make inferences about causes and effects of the situation (Kelley and Michela, 1980). These inference processes, in turn, create mental models which are salient and easily retrievable when the manager confronts the ambiguities of the organizational environments in later periods (Wells, 1982), thus:

> **H2:Managers who have experienced opportunities attributed to changes in given environmental sectors will focus more on those sectors than managers who have not experienced such opportunities.**

It is also well known from the strategic management litterature that environmental changes from time to time create threats to the organizations' goal achievement (e.g. Meyer, 1982). A sudden rupture in the availability of vital raw materials, such as the one affecting many industrial sectors during the first oil crisis is an example of an environmentally created

threat. Threats are likely to influence managers' environmental orientation because of the salience of the experiences created by the events. Threats are likely to trigger comprehensive information processing activities at a high level of involvement in order to understand sources of the threat and to develop organizational answers to the threat. Thus:

> **H3: Managers who have experienced threats generated by changes in one or several environmental sectors, will focus more on those sectors than managers who have not experienced such threats.**

It can be argued that bankruptcy constitutes the ultimate threat faced by a managers. Bankruptcy is presumably the final evidence that a manager has failed at his basic task, that is securing the survival of his firm. Thus, managers who have experienced bankrupcies are expected to have processed the event thouroghly and developed clear mental models of the reasons for the failure which are easily retrieved when the manager is facing new situations. If these reasons are attributed to external conditions such as demand fluctuations, hostile governmental actions and so on, it is assumed that the environmental sectors seen as causes of the bankruptcies will be salient to the manager, and reflected as a focus in his environmental orientation. Thus:

> **H4: Managers who have experienced bankruptcies perceived to be caused by changes in one or several environmental sectors will focus more on those sectors than managers who have not experienced bankruptcies perceived to be caused by such events.**

### 4.1.3 Departmental affiliation and environmental orientation

According to Dearborn and Simon's (1958) frequently cited study, individuals working in a given department tend to develop a local perspective on the organization and its environment. They briefly sketched two causal mechanisms which could produce departmental biases in the perception of complex situations. First, there is a cognitive explanation which stresses the effect of reinforcement of a particular mental model

through consistent and repetitive exposure to a particular kind of information. Since Dearborn and Simon's study, this assumption has been empirically investigated in more depth, and their assumption has generally been supported (e.g. Higgins and Bargh, 1987). Second, they hypothesized that there might be a motivational bias because goal structures differ between departments. The specific goals directing decision making and behavior in e.g. the marketing department is different from the goals of the human resource development department. Although Dearborn and Simon (1958) found strong support for a departmental bias in perception of complex stimuli, several aspects of the study design limit the generalizability of the results.

First, the study is nearly 35 years old. Several developments have taken place since which could affect the relationship between departmental affiliation and managers' perception of a complex situation. One major management tool which has gained in application since the late 50s is strategic management. Strategic management tries to develop a holistic perspective on the organization and its environment, to give the whole organization a unified direction through vision development, structuring and coordination of departmental goals and activities. This development of a common understanding of the organization, its distinctive competence, and its place in a broader environment (mission) could weaken the motivational argument for departmental biases, which might have been valid at the time. From my perspective, the study was also limited in its conception and measurement of problem loci as it did not provide detailed information on the managers' attribution of problems across specific environmental sectors. Second, the authors did not explore alternative explanations of their findings. One plausible explanation which could have produced this result is the educational background of the managers. Dearborn and Simon's (1958) managers were holding positions in sales, accounting, legal, production and several other departments. It is likely that individuals holding middle management positions in such departments have different educational backgrounds. As argued above, education provides individuals with mental models of the organization and its environments and how to exploit opportunities and cope with threats generated by different elements of their worlds. Different educational backgrounds could affect both the availability of candidate problems from memory and the individuals' ability to generate solutions for the organizational problem presented in the case. A final comment on their interpretation of

the results concerns the preliminary and superfical character of the study. The authors make a major point of the fact that sales personell attribute more causes to be sales problems than personell with other affiliations. Their results, however, show that accounting personell make relatively more attributions to the sales function (100 %), than the sales personell (83 %). This finding is not commented by Dearborn and Simon, and is difficult to explain from their perspective (motivational and cognitive effects due to goals and exposure to information). One more recent study (Walsh, 1988), although using a different design, has replicated this early study by Dearborn and Simon. Walsh (1988) found that a majority of the managers participating in his study could be classified as generalists, i.e. they did not manifest any specific focus with respect to the locus of believed causes to organizational success. This finding, taken alone, was unexpected given Dearborn and Simon's (1958) beliefs that managers' perception of ambiguous situations would be influenced by the managers' functional affiliation. Walsh found some correlations between functional background and belief structures for some of the managers, but concluded:

> "Three-quarters of this group either had strong conceptions of success that crossed functional lines, or had not firmely held dominant conception of success. The selectivity of managers' perceptions may not be as constrained as Dearborn and Simon (1958) thought." (p. 887)

Although it represents a major step in the right direction with respect to design, Walsh's (1988) study contains some of the same shortcomings as does Dearborn and Simon's (1958) study. Before addressing this, I will try to explain the apparently different findings from these two studies. It seems highly likely from my litterature review, that managers' belief structures are the product of individual, organizational and environmental factors. Dearborn and Simon (1958) tested their hypotheses on a sample of twenty-three executives from a single large manufacturing concern (ibid., p. 310). It can be argued that Dearborn and Simon's design held immediate organizational and environmental influences constant, while these were allowed to vary in Walsh's design. Thus, Dearborn and Simon's design was better fit to detect the partial influence of departmental affiliation on managers' belief structures. The largely negative findings of Walsh (1988) could therefore be explained by

interference of influences from variables such as differential uncertainty levels of internal and external factors in the industries in which the managers were embedded and differences in organizational strategies and strategy processes which make different aspects of a given situation salient to the managers. As in Dearborn and Simon's (1958) study, Walsh did not control for different types of education, which to me seems to be a flaw in the design which could have been eliminated à priori through more serious theoretical analysis. From a cognitive perspective, departmental affiliation only represents one of several information processing environments the individual is exposed to. His belief structures are the product of all causally relevant experiences. As is evident from this review, it is still unclear whether the immediate environment created by a functional department within a firm represents a major influence on the cognition of the employees in that department. More to the point, it is unclear whether the environmental orientation of managers from different departments will differ. Given the strong à priori arguments for department specific influences on managers' environmental orientation, I believe that the low power inherent in Walsh's design has produced a Type II error and that departmental biases could have been detected if he had controlled for other factors infuencing the belief structures of his managers. Thus the following general hypothesis:

**H5: The environmental orientation of managers will vary with departmental affiliation**

Moreover, environmental orientation is believed to be influenced by managerial level in an organization. Top management, i.e. the chief executive officer has the total responsibility for the goal achievement of his firm. Consequently, he needs to develop a holistic perspective on the firm and its environments. Middle management, on the other hand, is part of an organizational structure put in place in order to capitalize on higher efficiency through specialization ond division of labor within the organization. Thus:

**H5a: Chief executive officers hold environmental orientations which are less focused than middle managers**

### 4.1.4 Dynamics - Cognitive developments through work experience

As argued above, in the early phases of their carriers, managers have to rely on mental models developed from exposure to information transmitted to them during their formal training. It is therefore expected that, initially, the tie between biases inherent in the curricula to which they are exposed and their environmental orientation will be quite strong. As the individual manager gains work experience, however, this has to be assimilated within existing mental models or the experience will accomodate the models developed during the formal education. The manager is confronted with an organizational and environmental reality, which may differ from his mental representation in several respects. As direct exposure to these realities represents a more vivid stimulus environment than the more pallid stimuli the individual was exposed to during his formal training, it is expected that work experience will gradually change his environmental orientation so it becomes more congruent with objective characteristics of the reality he experiences in his daily work. Work experience is generally also more recent than formal education. Research in cognitive psychology has provided evidence that recent experiences are more easily remembered and therefore more influential on the individual's present cognitive activities. This view of the possibility of cognitive development through mental model change is superficially somewhat contradictory to the findings from attribution theory, which have generally drawn a picture of humans as selectively processing belief consistent information, actively assimilating discrepant information into preexisting knowledge structures and often being quite insensitive to belief inconsistent information altogether (see the review by Higgins and Bargh, 1987). Recent research, however, has shown that when people are motivated to be accurate or to understand and predict a given situation, they will expend the effort to modify their beliefs to suit the data. Managers, it can be argued, are highly motivated to understand their organizational environments in order to perform their tasks. This high level of motivation should therefore produce more bottom-up information processing, where new information is allowed to change the mental models of phenomena they encounter. Influences from their organization's strategy, strategy work and idiosyncracies of the specific industries in which they have worked, are accomodated to the extent that these create a reality which is only imperfectly congruent with their initial mental models developed during formal training. Thus, I expect that:

**H6: The strength of the relationship between formal education and environmental orientation will decrease monotonically with the amount of work experience**

## 4.2 Business Strategy and Environmental Orientation

As was explained in the previous chapter, the strategy of a business firm creates a unitary vision of where the firm wants to be positioned at some future point in time. In firms where the top management has consciously developed this vision after performing thorough analyses of internal and external environments, and where the top management has become conscious of the firm's strategic core(s), its intended product-market scope and so on, they will often spend considerable resources on communicating their vision to their subordinates. In firms where the strategic management philosophy has been fully adopted, management also structure goals and reward systems in order to reinforce decision making and action supporting and implementing the formulated strategies (e.g. Kilmann, 1989; Mintzberg and Waters, 1985). As a consequence, business strategy is expected to form environmental orientation of managers. To the extent that firms have different strategies, managers' environmental orientation is expected to differ as well. Thus, the following general hypothesis:

**H7: Environmental orientation of managers will vary with the business strategy of their firms.**

The logic behind this hypothesis is that managers will tend to focus on environmental sectors which are crucial to the successful implementation of their chosen business strategy.

The Miles and Snow (1978) typology, along with their descriptions of how management within each group approached entrepreneurial, engineering and administrative problems generated by their business strategies (pp 31-93) provides information on how managers in

each group can differ with regard to their environmental orientations. The relative focus on customers, technology, public sector and so forth is not directly explicated by Miles and Snow (1978), but has to be deduced from the sources of competitive advantage pursued under the different types of strategies.

Domain defenders operate within a limited segment of their industries. Their main goal is to maintain a competitive edge within this segment. Holding or improving the competitive position in this segment is done by means of technological efficiency and incremental improvement of their products' quality level. The defenders' choice of a stable product-market domain, offers the opportunity to learn gradually about the preferences and patterns in demand of a relatively narrow and possibly homogenous group of customers. Knowledge of customers preferences and patterns of demand are at least as important to domain defenders as it is to firms pursuing the other two strategies, but their choice of operating within a stable domain, increases the opportunity to learn about these demand characteristics. This learning creates certainty about developments in the customer sector, and makes it relatively less vital to monitor the customer sector intensively. As a consequence, I believe that:

> **H8: The more pronounced the domain defending trait of the organization, the less managers focus on customers.**

Miles and Snow's (1978) observation that marketing managers are seldom part of domain defenders' dominant coalition, is also consistent with the relatively modest customer orientation of these firms.

The monitoring of technological developments is vital to all three strategic types. The role of technology in the implementation of the strategies, however, differs considerably. For domain defenders, relevant technology is defined rather narrowly as a means of improving existing products, or making the existing processes more efficient. Analyzers and prospectors on the other hand, consider technological developments as a source of new business opportunities. This wider definition of what constitutes relevant technologies, creates a need to devote more attention to the monitoring and analysis of technology

sectors in the environments. Thus:

**H9: The more pronounced the analyzer trait of the organization, the more managers focus on technology**

and

**H10: The more pronounced the prospector trait of the organization, the more managers focus on technology**

None of the three strategists are immune to influences from other firms pursuing the same goals and aspiring for similar domains. Their exposure to effects of competitors' actions are, however, somewhat different. The domain defender is probably the strategist most vulnerable to competitors' actions. These firms have over a considerable period of time developed organizational capabilities, structures and routines tailor-made for operation within a given product-market domain. This development of highly specialized competencies and resources, create exit barriers to the firms, because the value of these resources are cosiderably reduced if they are to be deployed outside the intended domain. Analyzers face a similar problem within their core areas of activity. Analyzers operate as domain defenders within these areas, but enter new, sometimes unrelated areas if these are considered attractive. Analyzers are, by consequence, vulnerable to competition but less so than domain defenders because analyzers' commitment to a single given domain is somewhat less. Prospectors are the strategists relatively least influenced by competitors' actions. Their strategy implies creating flexible organizations, generalized competences and less commitment to any single domain. Further, inherent in their strategy is the tendency to enter new business areas relatively early in their life cycles. Early phases of an industry's life cycle are characterized by a relatively mild level of competitive rivalry. It is generally assumed that the competitive intensity increases as the industry approaches maturity, and culmintates when it passes from maturity to the end game (e.g., Harrigan, 1984; Porter, 1980). From these arguments it follows that:

**H11: The more pronounced the domain defender trait of the organization, the more managers will focus on competitors.**

and

**H12: The more pronounced the prospector trait of the organization, the less managers will focus on competitors**

Porter (1980) developed another conceptual scheme for classifying firms based on differences in their pursuit of competitive advantage. As was discussed in the previous chapter, Porter argued that competitive advantage either has to be based on cost leadership or on differentiation. Which of these generic strategies is the main source of competitive advantage will influence the relative importance of different environmental sectors to the firm. Firms pursuing a strategy of cost leadership devote much managerial time and attention to creating organizational arrangements aimed at reducing the costs, while maintaining an acceptable level of performance on other product attributes important to the customers. In most industries, inputs (raw materials, parts, energy and so on) constitute a major part of total costs. According to a recent study by the McKinsey Co., costs of purchased goods and services account for 70-80 % of sales in many manufacturing industries (Cammish and Keough, 1991). It seems plausible, then that sourcing, development of relations with suppliers and evaluation of suppliers should be a major concern for managers in firms pursuing a cost leader strategy. This does not imply that developments in supplier sectors are unimportant to firms pursuing a differentiation strategy. Rather when comparing the importance of suppliers to firms in the two strategic groups, supplier relations seem more important to the implementation of a cost leader strategy. Thus:

**H13: The more pronounced the cost leader trait of the organization, the more managers will focus on the supply sector.**

Some industries are heavily subsidized by government. The transfer of subsidies takes on different forms which may range from lower investment taxes to direct price subsidies. In industries where governmental subsidies constitute a major part of the industry's income,

managers are likely to devote considerable amounts of time and attention to monitoring changes in government policy towards the industry. The importance of government policy, however, is not the same for all firms. Firms pursuing a cost leader strategy are likely to see government policy as more important than firms relying on superior product performance for market success. Costs, and the influence of government subsidies on costs, are more important to cost leaders than they are to firms pursuing a differentiation strategy. Thus:

**H14: In industries significantly subsidized by government, the more pronounced the cost leader trait, the more managers will focus on the public sector.**

A successful implementation of a differentiator strategy relies heavily on deep knowledge of customer needs and preferences. The tactic of a differentiator is to gain a better match between performance of products and customer preferences than its competitors. Achieving this match is assumed to produce higher willingness to pay price premiums for its products - the price premium covering higher costs and higher margins than the industry's average. The implementation of a differentiator strategy consequently requires superior customer knowledge, and so I hypothesize that:

**H15: The more pronounced the differentiator trait of the organization, the more managers will focus on customers.**

## 4.3 Strategy development process and environmental orientation

There are several reasons why business firms use formal processes of strategy development. First, by putting the whole organization, its structure, processes and present and future domain on the agenda, management initiates a process by which it becomes legitimate to question how things are done, future consequences of present activities and whether new goals for the organization should be pursued in light of possible changes in key organizational environments. Second, it often culminates in the formulation of intended changes in important priorities, both with respect to internal activities and the organizatiton's position with regard to customers, competitors and other environments. Strategy development processes are also assumed to increase the validity of assumptions and understanding of the organization's distinctive competences. The process is further seen as an important vehicle for detecting important environmental changes which might produce threats or opportunities for the organization. Finally, the process puts in place systems for rewarding behaviors thus contributing to moving the organization in the direction often specified in a mission statement; and a system for monitoring the movement of the organization in the intended direction. As was pointed out in the previous section of this dissertation strategy processes in firms range from highly comprehensive and formalized processes which encompass a wide range of analytical and implementation-oriented activities, to rudimentary processes in which activities normally associated with strategy development can hardly be distinguished from the normal day-to-day activities of management. As argued above, the degree of comprehensiveness in the strategy development process undertaken by a firm is likely to have several impacts on its managers' environmental orientation.

One important element in a strategy development process is environmental analysis (Lenz and Engledow, 1985; Day, 1986). Environmental analyses may encompass the application of a wide range of theories, techniques and data, but the main purpose of this acitivty is to increase strategic management's understanding of their organization's environments, and provide a knowledge foundation for prediction of possible and probable future states, for instance by using scenario techniques. Environmental analysis has the potential of providing a reality test of managerial assumptions about their environments (Schneider and

Srivastava, 1984). For analytical purposes, one might imagine a manager possessing a given environmental orientation which is a product of education, previous work experience, specific influences from the organization's overall strategy and possibly other factors not specified in my model. The undertaking of a comprehensive environmental analysis process may reveal biases and underrepresentation of environmental sectors inherent in this manager's environmental orientation. It is, by consequence, likely that managers in firms employing comprehensive strategy development processes will discover environmental contingencies hitherto unrepresented in their environmental orientations. Thus:

> **H16: Managers in firms using a comprehensive strategy development process will hold an environmental orientation which is different from that of managers of firms not using formalized, comprehensive strategy developement processes.**
>
> **H17: The more comprehensive the strategy development process in a firm is, the more balanced the environmental orientation of managers from that firm.**

A comprehensive strategy development process will also counteract the biases inherent in managers' environmental orientations that result from education and other experiences. Even if a manager enters a process with biases created through education or departmental affiliation, the process is likely to form representations of environmental sectors which are important to the goal achievement of the firm, but which have been underrepresented in the given manager's environmental orientation. Thus:

> **H18: The more comprehensive the strategy development process, the weaker will the relationship between experiental background and environmental orientation be.**

## 4.4 Environments and environmental orientation

As was pointed out in the theoretical section, environments are a continuous source of opportunities and threats to the achievement of organizational goals. Due to their complexity, they are only partially perceived and understood by managers. It was also pointed out that different organizations face environments with different characteristics. In a sense, the environments of any given organization is unique because of the uniqueness in choice of domain and the interorganizational devices organizations use in order to create predictability in their particular environments and to reduce the level of uncertainty created by environmental changes. It has been common, however, to assume that organizations operating within a given industry share some important environmental characteristics. Implicitly, it is assumed that variation in environmental characteristics within an industry is less than variation between industries. One such characteristic is the level of uncertainty associated with each environmental sector. Some industries may experience technological change at a very high pace. Far-reaching technological change tends to occur in periods creating eras of ferment which forces whole industries to experiment with the new technology. These turbulent periods are followed by long periods of incremental learning and improvements in this basic technology (Tushman and Anderson, 1986). Other industries operate in environments characterized by the employment of mostly mature technologies which create lower levels of uncertainty with regard to technological opportunities or threats. As an example of this industry specficity of uncertainty associated with different environments, consider Fomburn and Zajac's (1987) study of the financial services industry. These authors claimed that technological, political and competitive environments created most opportunities and threats for encumbent firms (p. 39). The first, general hypothesis tries to capture the inter-industry difference in uncertainty attached to different environmental sectors:

**H19: Environmental orientation of managers will vary by industry**

Uncertainty creates a wide variety of problems for managers if it stems from environmental elements vital to the organization's goal achievement. As indicated above, technological change must be attended to due to its impact on the organization's

competitiveness (Tushman and Anderson, 1986). Changes in customer preferences have to be understood by management in order to obtain a sustained fit between performance of the organizations' products or services and customer tastes (e.g. Day and Wensley, 1983).

However, even if systematic differences in environmental orientation across industries is detected, this does not provide evidence that these differences are created by different levels of uncertainty in the industries. In order to investigate the causal mechanism at work, we must establish a direct relationship between level of uncertainty in environmental sectors and managers' focus on those environments. Thus:

**H20: Managers' environmental orientation will reflect the level of uncertainty inherent in their environments**

# CHAPTER 5

# RESEARCH DESIGN, SETTING AND DATA COLLECTION

In this chapter I first present the research design employed in this study, along with arguments for chosing this particular design and a discussion of some limitations inherent in it. Second, I present the specific setting chosen in order to explore research questions and to test the hypotheses formulated in the previous chapter.

## 5.1 Design

As has become evident through reading of the previous chapters, environmental orientation is a new concept, and the factors forming and changing individual managers' environmental orientation are largely unknown. My research strategy in this dissertation has been to formulate causal explanations of differences in environmental orientation and to explore these using a cross sectional design, where the detection of relationship between predictors and environmental orientation is done through statistical analyses. Inherent in this design is the logical impossibility of establishing causality. That is, there is no formal way in which one can prove that the putative causes influence the putative effects and not vice versa. The reasons for this are that in order to determine the direction of causality, the cause and effect should be separated with respect to time, the units of observation should be isolated from factors influencing the relationships under observation, and the units of observation - on average - should be identical on all factors which are not measured, but which could affect these relationships (Cook and Campbell, 1979). For some of my predictors (e.g. education and previous experience from other industries), there is no ambiguity with respect to which of the two precedes the other. For the remaining predictors, I have to rely on à priori theoretical arguments as to which of the two causes the other. Comparability is attempted through use of measurement and statistical control.

This inherent weakness had to be traded off with the limitations inherent in alternative

designs, notably a time series design and an experimental design. Although the research model and the hypotheses are developed though extensive use of previous theorizing and empirical research results, research on environmental orientation and factors affecting this managerial trait is virutally non-existent. If this dissertation is positioned in a cumulative knowledge generation process, it belongs to a very early phase of this process. As was my conclusion from the review of research relevant to the understanding of environmental orientation, we still know very little about how managers allocate their attention, information-processing capabilities and time among environmental requirements - and even less about what factors affect the individual manager's allocation. One of the main purposes of this dissertation is to identify some broad categories of variables influencing environmental orientation. If a statistical relationship between the two can be established, the next step is to scrutinize questions of causality using designs which are stronger with respect to the internal validity of the results.

It was judged that the detection of variables influencing environmental orientation and the analysis of forms of environmental orientation by itself required studying real managers. One important set of predictors is various forms of work experience which were judged difficult to manipulate validly in an experiment. Further, experience may interact with the other predictors of environmental orientation. E.g. it is possible that the effects of business strategy or external uncertainty in environmental orientation is dependent on the form and level of work experience. If this is true, generalizability is contingent on equal marginal distribution of experience in experimental group and target population (Lynch, 1982). This ruled out the use of student subjects which is often the setting in experimental behavioral research. Then we are left with experimental or time series designs with managers as subjects. An experimental design has several limitations which was judged important for this study. As was indicated above, an experimental design is fit if the researcher can formulate specific hypothesis informed by a strong theoretical frame developed in previous research. This is not the case regarding environmental orientation of managers. Further, and related to the previous point, experiments are limited with respect to their ability to handle large numbers of predictors. My research model uses predictors from three levels (individual, organizational and environmental levels). The simplest possible experimental design involving one dichtomized variable from each of these levels

would require 6 experimental groups if no interactions are assumed. A design involving two dichotomized variables form each level (e.g. education and work experience, strategy content and process, customer uncertainty and supply unceratinty) would require 48 experimental groups. Clearly the use of an experimental design would have put severe limits on the number of variables which could be included in the study. Due to the exploratory nature and the fairly weak theoretical foundation for the hypotheses, it was judged inappropriate at this stage to focus on a few variables assumed to affect environmental orientation. Another important argument in disfavor of an experimental design is the difficulty of developing valid treatments to represent the underlying theoretical constructs. This is particularly the case for the experiental background of managers which is judged to be difficult to manipulate in an experimental setting. Business strategy, strategy development process and uncertainty levels of different environments could have been handled in an experimental design (see below, Chapter 11), but degree to which these operationalizations represent real life influences on practizing managers is questionable. A time series design was ruled out mainly because it could not improve the shortcomings of a correlational design within the time frame of a dissertation. It was judged highly risky to select a sample of managers for pretest and then hope for a change in strategy, level of environmental uncertainty in one or several environmental sectors or work experience, the effects of which could have been measured in a post-test.

Based on these considerations I chose to use a cross sectional design for testing the propositions and hypotheses presented in the previous chapters. Choosing a cross-sectional design normally has the unattractive implication of not permitting formal tests of causality. This because the putative causes and effects have not been separated in time, because third variables may have affected predictors and criterion simulataneously and because there is no formal way of ruling out competing explainations for the eventual findings. These shortcomings are also present in this study, although some of the putative causes can be proven to precede the effects (e.g. education, previous work experience). The possibilities of spurious findings or reversed causality are, however, far from being ruled out, and will be discussed in depth in later chapters (Chapters: Limitations of the study and Future research).

## 5.2 Setting

One set of hypotheses concerns the relationship between environmental uncertainty and environmental orientation. This requires collecting information from managers operating in environments with different levels of uncertainty associated with different environmental sectors. My strategy for operationalizing different levels of uncertainty was to study managers in two different industries. Any two industries could have been chosen as long as one could establish evidence that they differed with respect to the level of uncertainty associated with at least one environmental sector. After having considered several candidate industries, I chose to include the fishing industry and the boat building industry. As is explained in further detail below, these industries are assumed to provide contrast with regard to the level of uncertainty in several environmental sectors. A manipulation check using a jury of experts was performed in order to assess the validity of this operationalization of environmental uncertainties (see next chapter: Measurement and construct validation).

### 5.2.1 The Norwegian Fishing Industry

The Norwegian fishing industry (SIC code 3114) constitutes a value system (Porter, 1985) with three distinct levels: Primary producers, processors and exporters.

First, there is a primary producing level made up of fishermen. The activities of this level is largely constrained to capturing of wild fish, which is delivered to a secondary, processing level. Another population of firms on the primary level is fish farms. These firms rear salmon to market size, which in turn is sold to processors and independent exporters for sales to the domestic and international markets. The processing level's activities encompass sourcing of raw material, raw material handling, processing of the seafood into a fairly limited range of intermediate or finished products which is often sold to independent exporters or wholesalers. The sampling frame used included only firms

from the second and third levels of this value system.

### Processors

By January 1991, there were registered 1430 fish processing firms in Norway. From this grand total, 226 were fishing boats equipped to process their own catch into intermediate or finished products, yielding a total of 1204 land-based processing plants. The plants are producing 25 product categories, ranging from fresh packed fish to ready-to-eat frozen dishes (Fiskeridirektøren, 1991).

### Exporters

Due to Norwegian legislation, the export function has traditionally been performed by independent firms, owned and run by specialized exporters. This legislation granted permission to export on a product by product basis, resulting in a population of specialist exporters handling relatively narrow product lines. Recently, however, the legislation was changed. Today export permissions are given for the whole range of seafood products. The exporting part of the fisheries value system is made up of a total of 475 firms (Steen, 1992; pers.comm.) exporting their products virtually world wide.

## Environments of the fishing industry

In this section I describe the environments of the Norwegian fishing industry. The description is focused on the five environmental sectors included in this study and the goal is to indicate the level of uncertainty associated with each of these sectors.
It is argued that the industry is characterized by very high levels of supply uncertainty. This trait is probably the most salient dimension when comparing this industry to most other industries. Further, it is argued that the level of technological and customer uncertainty is fairly low due to stable preferences and level of demand as well as use of mature technologies which have changed little over the past decades. Considerable

uncertainty is associated with the public sector as regulatory policy and governmental aids are currently being revised.

Customer and customer uncertainty

Although the customer sector of the Norwegian fishing industry is undergoing significant changes, the level of uncertainty associated with this sector is fairly low. Typical changes presently occuring at the consumer level are as in most industrial countries increased consumption of fish, increased focus on food not containing any kinds of additives and increased demand for food containing non-saturated fat. At the distributor level, a major structural change is currently on its way as supermarket chains are rapidly increasing their market shares at the cost of more traditional forms of distribution. These changes, although of vital importance to the future for the whole fishing industry, are occuring at a relatively slow pace. They have been developing gradually over the past years without any sharp changes in direction from one year to the next. I therefore conclude that, compared to many other industries the fishing industry is facing fairly low levels of demand uncertainty.

Technology and technological uncertainty

Key technologies in the fishing industry are processing and freezing technologies. Processing technologies used by the fishing industry can be characterized as mature technologies (Tushman and Anderson, 1986). The most important end products produced by the Norwegian fishing industry are fresh, whole fish, dried and salted fish and fresh and frozen fillets in different forms. The technologies used for freezing and processing of these products are from periods ranging from several decades to thousands of years ago. Although research and development on these basic technologies continuously is being done, technological changes are incremental and marginal improvements without large, discrete breakthroughs which can dramatically alter the processes themselves or their cost/performance ratios.

Supply and supply uncertainty

One very salient feature of the fishing industry is the rapid changes in, and unpredictability of availability in raw materials. Although aquaculture has changed this picture substantially in recent years, most Norwegian fish processors still rely on wild caught fish for their activities. The unpredictability of supplies is creating a host of problems for all actors involved in this industry. It affects demand for production of input factors, such as fishing boats, factory equipment and fishing gear. It also makes the investment decisions of fishermen highly risky as their income is a direct function of the quotas established by public agencies. These quotas, in turn, are settled as a percentage of estimated biomass. For the fishing industry, supply uncertainty makes any kind of long term investments risky. Supply uncertainty is often used as an explanation for low levels of product development and marketing activities in this industry.

Public sector related uncertainty

The Norwegian fishing industry is very much affected by policies and decisions made by public agents. At the administrative level, the industry has its own ministery devoted to fisheries policies. The industry has long been seen as an important instrument in the rural policy of this country. The public sector uses two broad classes of instruments in order to influence the structure and development in the industry. First, there is an extensive use of regulations on all levels in the industry. At the primary level (see above), government regulates strictly entry into the sector as professional fishermen. Once in the industry, fishermen are subject to restrictions on the amount of fish they can catch. These limitations are implemented in the form of quotas for each participating boat. Quotas are changed continously, reflecting the levels of stock biomass and age distribution in virtually all economically important fish species. Although the underlying reason for these changes are biological, they are often attributed to the government and their advisors. Lately there has been a tendency to consider deregulation of parts of the fishing industry. A deregulation of the export part of the value system has already been implemented, and currently the different parties are considering deregulation of the price determination on

first hand. These changes in regulation create deep structural changes at every level of the industry and considerable regulatory uncertainty for managers who try to plan ahead. Second, the public sector makes considerable income transfers and other monetary incentives to the fishing sector. The income tranfers peaked in the early eighties when the passed the level of one billion NOK. Other important public transfers to the fishing industry has been capacity reduction programs and investment support in the form of direct financing as well as subidized loans. In the past few years a public goal has been to reduce the transfers to the fishing industry. This has resulted in a sharp reduction in the direct income transfer which possibly will continue in the future. In sum, public sector regulations creates considerable uncertainty for the fish industry.

Competitors and competitor sector uncertainty

Many industry analysts tend to classify the fishing industry as a classical case of perfect competition. The products, although not perfectly homogeneous, are very similar, there is an increasingly free flow of information about supply and demand due to improvements in language skills, computerized information systems that record and transmit price and other supply information and telecommunication in general. Finally, if one considers the international fishing industry at large, entry barriers are generally sufficiently low to secure entry into the sector, and there are no dominant players in the industry - the total volume of business is fairly evenly distributed across a very large number of firms. As argued by some organizational theorists, the level of uncertainty created by competitors is a function of the industry structure. In industries with very few participants, the level of competitor uncertainty is fairly low because lateral informal coordinating mechanisms can be created between the firms. As the number of firms increases so does the competitive uncertainty because it becomes increasingly difficult to safeguard the compliance to informal rules, and the risk of opportunistic rule breaking behavior increases. As the number of firms increases further, the uncertainty decreases because the impact of plans and actions of individual competitors on one specific firm decreases. In one sense, this multitude of firms create uncertainty because due to the number of actors no firm can monitor plans and actions of all other industry participants. Competitors, however, create

fairly low levels of **strategic uncertainty** (Boulton et al, 1982; Parks, Sormunen and Daft, 1988) which has to be reduced through allocating large amounts of attention to the sector, because no individual competing firm is large enough to have substantial impact on the demand conditions facing another. Based on this, my conclusion is that firms in the Norwegian Fish industry experience moderate levels of competitor uncertainty.

### 5.2.2 The Norwegian Shipbuilding Industry

The Norwegian shipbuilding industry (SIC codes 38411 and 38412) is a collection of firms with a major part (>50%) of their activity devoted to building, rebuilding and repair of boats. The industry has long traditions in Norway, but has continously managed to renew itself through several technological discontinuities, survived periods of bust, challenges from lower costs producing countries and is increasingly competing on the world markets. Today it represents a fairly high technology sector both with respect to product technology and process technology. The leading edge Norwegian shipbuilders today, build speciality ships for fishing, research, seismic search for oil using state of the art processing technologies i.e. integrated cad and cam systems. The ships are often equipped with state of the art navigation, fish finding, seismic, cargo handling equipment as well as engines. The industry, as defined by its SIC codes encompasses firms producing both leisure boats and commercial vessels. In this study, only firms producing commercial vessels are included. The industry was as at 1989, populated by 518 firms.

### Environments of the shipbuilding industry

This section is devoted to a description of salient characteristics of the environments surrounding the Norwegian shipbuilding industry. The section is organized in the same manner as the previous on the environments of the Norwegian fishing industry.
It is argued below that a typical firm in the shipbuilding industry faces considerable

environmental uncertainty from several environmental sectors. Both product and process technology is changing fairly rapidly and much of these changes are initiated by actors external to individual firms in the industry. Rapid and unpredictable technological changes generate a fairly high level of technological uncertainty for shipbuilders. It is also argued that firms in this industry face significant customer and regulatory uncertainty due to the frequency and unpredictability of changes occuring in these sectors. The only fairly stable sector surrounding firms in this industry is the supply sector. Key inputs are steel and components whose quality and availability is quite stable.

Customers and demand uncertainty

The shipbuilding industry's output is directed towards four major market segments (West Norway Shipbuilders' Association, 1992) : the fishing boat segment (ranging from smaller vessels designed for coastal fisheries to factory ships designed for off-shore fishing world wide and on board processing of the catch), the offshore segment (including supply vessels, exploring vessels and stand by vessels), the cargo segment (including vessels for transport of a wide range of bulk products as well as packaged cargo) and the passenger transport segment (including ferries, single and twin-hull rapid transit vessels and more convential passenger vessels). Many of these market segments are subject to rapid changes in demand. Although many shipbuilders have attempted to develop customer bases with different business cycles, the cargo vessel segment still is subject to large variations in demand. The demand in this segment is closely related to the development in the general economic environments nationally and internationally. The demand for cargo vessels is correlated with the national and international levels of trade which are subject to large scale variations as a function of the general economic climate. The market for fishing vessels is also characterized by a high level of turbulence. The demand for fishing vessels is closely related to the resource situation for major fishing stocks and its prospects for the near future. Although I do not know of any studies of the investment behavior of fishermen, it is often assumed - both within the fishing and shipbuilding industries - that fishermen start to contract for new vessels when the prospects for high fish stock levels are good. This is illustrated by the contracting activity following fishery biologists' prognosis for the cod stock a few years ago. After a long period of low stock levels,

Norwegian fishery biologists predicted a substantial increase in the stock biomass. This prognosis was followed by intense contracting activity among Norwegian fishermen anticipating high revenues due to increased catches. The level of demand in the two other major segments, the passenger vessel and off-shore segments are probably somewhat more easy to predict as they are less subject to the effect of largely unpredictable underlying factors like fish stock levels and general economic climate. In sum, it is assumed that the customer uncertainty is higher in the shipbuilding industry than the fishing industry.

## Competitors and competitive uncertainty

As pointed out above, there are more than 518 Norwegian shipbuilding firms. Although some are considerable larger than others, no single firm can be said to dominate the industry in the sense that it has the power to affect market prices through its own actions. The market structure is probably an approximation to the economists' notion of monopolistic competition, where each firm has some degree of market power due to product differences, interpersonal and interorganizational relations creating some firm-specific preferences in the market, restricted information flows and so on. A structure without any dominant players has often been assumed to create moderate levels of competitive uncertainty (Daft, Sormunen and Parks, 1988). There may be considerable uncertainty with respect to the plans and actions of any individual competing firm, but the sizes of the firms are too small to produce industry-wide effects on prices or competitive behavior. Thus, we assume that the level of competitive uncertainty in the ship-building industry is comparable to that of the fishing industry.

## Technology and technological uncertainty

A characterization of the level of technological uncertainty in the shipbuilding industry depends to a certain extent, on which technology is considered. A shipbuilding firm is better considered as a collection of technologies than one single technology. Technologies

are employed in the design, construction, launching, finishing and quality control of the ships, as well as contained in the components (see above). Above I indicated that many of the technologies contained in a ship can be characterized as quite advanced. This does not, however, directly imply that the technology creates uncertainty. Uncertainty is mostly a result of change and unpredictability, although complexity sometimes has been included in the uncertainty contruct (e.g. Duncan, 1972). Changes in technologies relevant to this industry are occuring quite freqently. Within the field of naval design, there is a high level of R&D activity world wide. Two important fields for this activity are improvement of fuel economy and the development of high speed hulls. Thus, compared to managers in the fish industry, managers in the shipbuilding industry experience considerable levels of technological uncertainty.

Public sector related uncertainty

The shipbuilding industry is to a much less degree subject to extensive regulation than the fishing industry. Industry capacity regulations are passive in the sense that shipbuilders at present do not have access to regional development funds. Extensive legislation concerning concerning ship security exists, but these regulations do not change either frequently or unpredictably, and probably create little uncertainty for the industry. There is however considerable uncertainty associated with the governmental cost subsidies to the industry. Although there are conducted international negotiations to reduce the level of subsidies to the European shipbuilding industry, subsidies are still considered an important factor affecting the competitivity of nations. According to the industry, Norwegian governmental support to the industry is changing substantially from one year to the next, and a great deal of uncertainty is experienced every year when the governement is proposing and revising the national budget. Changes in some years are even decided between two budgets when acute need for financing other areas occur.

Supply and supply uncertainty

Every industry probably experience some uncertainty associated with their supply sectors. The uncertainty may result from changes in prices of important input factors, changes in the technological content of components, changes and unpredictability in qualitative dimensions of the input factors or - as is the case for the fishing industry - high change rate and low predictability of the availabilit of inputs altogether. The shipbuilding industry mainly buys its supplies from other highly industrialized sectors such as the steel industry, electronics industry, engine industry and several other industries supplying production or ship equipment. All of these are comparatively mature industries which create fairly high stability of supplies both with respect to availability and quality of the products. Compared to the fishing industry, the level of uncertainty associated with supplies is fairly low in the ship building industry.

## 5.3 Sampling frames and sampling procedure

A national database (Kompass) containing firms in the two industries was used as the sampling frame for this study. The firms included in the database provide firm specific information on a voluntary basis to the compiler of the information. The firm's motives for providing this information is that the database is used in sourcing by potential customers. Accordingly it is seen as a marketing instrument by the participating firms. This procedure for including firms in the database could introduce some bias compared to the composition of the industries to which they belong. The question of representativity, with respect to the two industries, was not judged to be very important, as this dissertation is concerned with theory development and theory testing rather than an exploration of environmental orientation in two industries (Calder et al. ,1980). Thus, generalizations about environmental orientation in a specific population based on findings in a sample from the two industries is not an issue here.

A total of 221 firms from the fishing industry were present in this data base. This represents approximately 15 % of the total number of fishing industry firms in Norway. From the ship building industry, 202 firms were present in the data base. This amounts to approximately 40 % of the total population of ship building firms in Norway. The sampling frame is somewhat biased towards larger firms with respect to the size distribution in the population, but this was not considered important, as a formal generalization of results back to a specified population of managers in fishing industry or shipbuilding firms was not a purpose of this study.

At the individual manager level, the top management team in a firm was operationalized as the top manager and his middle management. Information on organizational structure (upper levels) was available from the database for most firms. For those cases where this information was absent, the person first contacted in the firm was questioned about who constituted the top management team in the firm. Top management team was then explained to be those managers participating when major decisions were made. The final sampling frame, then, was the members of top management teams of the firms present in the database. The sampling frame was ordered alphabetically and by region. The final sample from this frame was drawn by working through the frame starting with the first firm in the first region.

### 5.4 Data collection procedure

A subsample of approximately 20 managers were contacted by telephone in order to appoint personal interviews in the initial phase of the study. This was done in order to get aquainted with the two industries, and to register explanations for the answers given to the questionnaire to be administered. After these initial interviews, it was felt that enough information on the two industries and the rationales for answering was obtained, and the rest of the survey was conducted without the presence of the researcher during the completion of the questionnaires. During this phase, managers were contacted by telephone in order to solicit their agreement to participate in the study. After agreement was obtained, a questionaire was mailed along with a brief cover letter (see Appendix 1 and 2). If the questionnaire was not returned within two weeks, a second call was made in

order to remind the respondent.

A total of 128 questionnaires was distributed; 64 to managers in the fishing industry and 64 to managers in the shipbuilding industry. Of these 88 usable questionnaires were returned, yielding a response rate of 71 % after the second call. Only one questionnaire had to be discarded due to incomplete answers.

# CHAPTER 6

## MEASUREMENT DEVELOPMENT

In this section I present and discuss the procedures used in order to generate and validate the measures used in the empirical part of this work. Following this, I present the scales used in order to measure the theoretical constructs included in the research model. Measurement of theoretical constructs is commonly regarded as a key challenge in all of the research traditions on which this work is built (e.g. Hambrick, 1980; Churchill, 1979; Venkatraman and Grant, 1986). Low quality measures creates problems in the analysis and interpretation of empirical research.

Among the problems encountered when inadequate attention has been devoted to measurement issues is attenuation of relationships between empirical operationalizations of theoretical constructs (Zeller and Carmines, 1980). Attenuation could increase the risk of committing Type II errors (i.e. accepting a wrong null hypothesis). Attenuation of empirical relationships is the result of low measurement **reliability**. Measurement reliability refers to the degree to which two or more attempts to measure the same construct yield the same result and is the first criterion that will be used to evaluate the quality of my measures. Several empirical indicators of measurement reliability have been proposed and are actually in use (e.g. Zeller and Carmines, 1980). In section 6.1, I discuss three reliability indicators, and present the arguments in favour of one of these.

The second set of criteria refers to whether one has successfully managed to tap the intended theoretical constructs with the measures applied. Development of measures is intimately connected with the theoretical definition of the constructs to be measured (e.g. Churchill, 1979). An important quality of measures is the correspondence between the theoretical meaning of constructs and the operations used for their measurement. This correspondence concerns the **validity** of the measures. Many validity criteria relevant to the evaluation of measures have been proposed in the litterature (see Cook and Campbell, 1979; Zeller and Carmines, 1980; Ghiselli, Campbell and Zedeck, 1981).

According to Ghiselli, Campbell and Zedeck (1981) there is still no consensus on what procedures constitute proper validation of measures. In the section 6.2, I discuss some validity indicators and choose indicators which seem fit for my purposes in this study.

## 6.1 Reliability indicators

Several indicators of scale reliability have been proposed in the litterature. Traditional measures of reliability fall into three categories, test-restest procedures, split-half procedures and coefficient alpha (e.g. Bollen, 1989). The test-retest procedure tries to assess temporal stability of empirical measures, and its use is built on the following logic. The extent to which an individual responses to the same measure at different time periods generates similar scores is assumed to be an indicator of the reliability of the measure. The test-retest procedure has one major limitation which was judged sufficiently important for it to be ruled out as a reliability assessment method in this study. Because it measures the same traits of the same individuals at two or more points in time, it is liable to memory effects. Given the relatively short time span of the empirical part of this dissertation, it was judged highly likely that many managers would remember their previous responses, and produce similar scores in a second test in order to appear consistent. High reliabilty could then be produced by a memory effect.

When using the split-half approach, the researcher takes several measures at one point in time, splits the measures into two groups, and calculates two combined measures based on the two halves. The correlation between the two combined measures across a set of respondents is taken as an indicator of the reliability of the scale. The reliability indicators obtained using this procedure has the unattractive property of being affected by the specific split which is done between the items. Different split will normally produce different magnitudes of the split half coefficient, a result which makes interpretation difficult.

Coefficient alpha solves this shortcoming, as the value of coefficient alpha is the average of all split-half coefficients which may be computed for a given set of

items. Coefficient alpha, however, like the two previous reliability indicators is based on an internal consistency argument. Internal consistency is an attractive measurement property if the constructs being measured can be assumed to be unidimensional. If the theoretical construct is assumed to be unidimensional, high intercorrelations between items and high item to total correlations is then indicating that all items are measuring the same underlying trait or construct.

Likert (1938) originally formulated an additional criterion to be used for the assessment of summative scales, the degree to which individual items discriminate between individuals with sharply different views on the subject in question. However, as argued by Edwards (1957) the conclusions with respect to which items to retain in a final scale are similar across assessment methods, and I will only use standard internal consistency for the assessment of scale reliabilities.

## 6.2 Validity indicators

Conceptually, the validity of research instruments and research results has several dimensions. Two basic kinds of validity - internal and external validity - are closely related to the basic design used in the study.

A third aspect of validity, construct validity, concerns the operational measures used to represent latent theoretical constructs included in the research perspective. Construct validity of measures refers to the correspondence between a construct and a purported measure of this construct (Peter, 1981). Operationally the assessment of construct validity has been done through investigating many different aspects or dimensions of construct validity, the most common of which are convergent, discriminant and nomological validity.

**Convergent** validity is concerned with the degree of correspondence between repeated attempts to measure the same constructs using different methods. If, for example, environmental orientation was measured using, say, observations of managers' activities

during a week, and direct questioning, and if the two methods lead to similar conclusions with regard to the pattern of attention allocation across managers, this would provide evidence of convergent construct validity. It is generally agreed that convergent validity only can be established through the converging results of several studies. According to Cronbach (1971) construct validation requires some amount of aggregation of results from series of reliability and validity studies. In addition, Campbell and Fiske (1959) argued that in order to establish convergent validity there is a need to "measure the same trait through maximally different methods" (p. 83).

An additional aspect of construct validity is the **discriminant validity** of the construct. This refers to whether an assumed new construct in fact differs from other, related constructs embedded in a given theoretical perspective. Thus, a new construct should be both conceptually distinct and operationally distinguishable from measures of other constructs. The notion of discriminant validity of theoretical constructs is also related to the use of aggregate results from several studies employing different methods.

The final aspect of construct validity assessment commonly used in construct validation studies is **nomological** validity. Nomological validity is concerned with whether the constructs (as operationalized in a particular study) behave as expected from a theoretical perspective. Formal tests of nomological validity are, thus, similar to tests of the theory itself as they have to be based on formal, theory-deducted hypotheses about the covariation (or lack thereof) between the construct under investigation and other constructs belonging to a given theoretical perspective. Cronbach and Meehl (1955), in their discussion of nomological validity state that "the investigation of a test's construct validity is not essentially different from the general scientific procedures for developing and confirming theories" (p. 300).

Empirical indicators of the three validity aspects are commonly derived from analyses of patterns of correlations between items and between individual items and combined scales. A much used procedure for assessing convergent and discriminant validity of scales is the multi-trait-multi-method matrix (Campbell and Fiske, 1959). This method requires the use

of different methods measuring the same construct. If only one method but several items measuring the same constructs is used, it does not provide more information of convergent validity than ordinary reliability analyses (see above). Convergence of several items on the same dimension in the mono-method version, only provides evidence of internal consistency within a measure, and not of convergent validity. The mono-method version compares the correlations of items within one scale with correlations across scales, which can be said to indicate dicriminant validity. The same form of discriminant validity indicators are, however, more directly provided by factor analysis, were the pattern of factor loadings indicates whether different items reflect different constructs in a way which is expected by the underlying measurement model. Based on these considerations, I chose to use factor analysis in order to explore the discriminant and convergent validity of the constructs operationalized by multi-item, Likert-type formative scales.

Nomological validity was explored by studying the simple correlations between constructs which can be hypothesized to correlate according to theory.

### 6.3 Measures

Any effort to develope valid and reliable measures of theoretical constructs must start out with a theoretical specification of its boundaries (Churchill, 1979; Venkatraman, 1989). Before presenting my measures of the constructs included in the model I recapitulate the theoretical specification of the constructs' domains.

### 6.3.1 Environmental orientation scale

An individual manager's environmental orientation was previously defined as his beliefs concerning the relative importance of environmental sectors. The measures used to capture the environmental orientation must reflect this definition. Although the construct has not previously been defined or operationalized, some guidance was found in the marketing litterature. Recently, efforts has been made in order to define (Kohli and Jaworski, 1990) and operationalize the market orientation construct (Narver and Slater, 1990; Davis, Morris and Allen, 1991). As discussed in the theoretical part of this thesis, market orientation at the individual level, can be viewed as a special case of, or a more narrowly defined version of the environmental orientation construct. The construct domain of market orientation has been specifyed as consisting of three dimensions, one internally oriented dimension, the emphasis on interfunctional coordination and two externally oriented dimensions, customer orientation and competitor orientation (Narver and Slater, 1990). The two externally oriented components of the construct was operationalized using items reflecting that these external sectors were seen as decision contingencies, that understanding of how they worked was seen as important, and that information gathering, analyses and disseminating activities concerning the sectors were performed.

The strategy followed in order to measure the managers' environmental orientation was to ask questions which answers would reflect different degrees of importance and attention devoted to trends, states and events in different environments. In my conceptualization of the environments, I chose to include only five segments previously identifyed as important to the goal achivement of a business firm, and approximately corresponding to what is commonly perceived as the firm's task environments (e.g. Dess and Beard, 1984). These segments were a technology segment, a customer segment, a competitor segment, a regulatory or public sector segment and a supplier segment. The managers' environmental orientation was measured using a scale containing a total of 30 items. Twenty of these items were worded in order to capture the managers' assumptions about the importance of each of the five environmental sectors (cognitive level). The remaining 10 were intended to capture behavioral reflections of the managers' environmental orientation (conative level).

The cognitive environmental orientation scale was composed of two parts. The first part encompassed 15 Likert-type items, the second part asked managers to allocate time of an environmental analyst to be employed in their company. The environmental orientation scales are reported in Appendix 1. As an illustration of the questions asked, one item from each of these measures is given below.

Part 1. Below follow some statements. For **each** statement please indicate your degree of agreement by a circle.

Knowledge of customers' desires and needs is an important determinant of success for my firm.

-5 -4 -3 -2 -1 0 1 2 3 4 5

Part 2. Assume that you are employing a person whose responsibilities are to analyze external conditions surronding the firm (information collection, analyses, influencing external acotrs and so on). Please allocate his working time (=100%) to the following sectors (if you with to give equal priority to each sector, you allocate 20 % pr sector).

Technology and technological developments:_____%

The next part of the scale intended to capture behavioral reflections of environmental orientations tapped time spent in contact with various environmental actors and amout of information processes concerning the various environmental sectors.

1. During a normal working week, how many hours do you spend in contact with the following kinds of external actors (by telephone, face to face, by letter, fax etc.)

Buyers of the firm's products:_____hours

2. As a percentage of your total information processing concerning these external sectors how much is allocated to each sector (total amount of information processing= 100%).

Customers and customer affairs:_____%

Both components of this environmental orientation scale are assumed to be reflective scales. That is, the levels of the individual's response to each item is seen to be caused by the underlying trait environmental orientation (Bollen, 1984). Information processing activities, stated assumptions about importance of and resource allocations made for monitoring the environmental sectors is assumed to reflect the underlying trait. A change in environmental orientation is expected to produce a change in scores on the items and not vice versa as would be the assumption if the scales were considered formative.

### 6.3.2 Experience scales

The definition of experience used in this dissertation is information processing experience concerning the five environmental sectors. A distinction was made between work experience and experience gained through formal education in order to explore whether direct experience form cognitive representations which are more salient and thus more available than vicarious experience.

The measurement of formal education in the sense of classifying individual managers into groups based on their education is quite straight forward, and the following items were used for this purpose:

Please indicate your highest degree(s) (e.g. high school)_____

What was your specialization:_____

In order to explore an eventual decay of educational effects on environmental orientation, the year of graduation was also recorded.

Year of graduation:_____

As the hypotheses are concerning the relationship between the content of educational programs and environmental orientation, a sample of judges graduated from different programs was used in order to provide external information on the treatment of customer affairs, technology and so on in each program.

In order to explore the effects of work experience, various measures of this construct was used. The first item was intended to explore the effect of total amount of work experience. This experience indicator has previously been used in research on leader performance.

Your age:_____

In order to test whether departmental biases in environmental orientation could be detected, the present and previous functional affiliations of the managers were recorded.

What is your present position in the company:_____
Please report which positions you have held (lasting more than one year) previously:_____

In order to explore whether previous experience from other industries would affect the relationship between industry characteristics and environmental orientation, an item asked the managers to report which other industries they had worked in.

In which other industries have you worked before you started in your present position (please also report the position and the period this position was held):_____

A final set of items was used to tap into whether the managers had experienced motivationally strong incidents which could be attributed to one or several of the environmental sectors.

Have you ever experienced economic crises in any of the companies in which you have worked_____.

If yes, please indicate the main reason(s) for this crisi(e)s (by ticking):

Technological conditions__
Demand conditions__
Competitive conditions__
Public sector conditions__
Supply conditions__
Internal conditions__

Have you ever experienced bankrupcy in any of the companies on which you have worked:_____.

If yes, please indicate the main reason(s) for this bankrupcy:

Technological conditions__

Demand conditions__
Competitive conditions__
Public sector conditions__
Supply conditions__
Internal conditions__

Have you ever experienced that changes internal to the firm or external to the firm have created new opportunities in any of the firms in which you have worked.

If yes, please indicate the main reason(s) for this opportunity:

Technological conditions__
Demand conditions__
Competitive conditions__
Public sector conditions__
Supply conditions__
Internal conditions__

These experience measures are considered formative. Experience was defined as information processing experience concerning environmental sectors. Experience is thus formed through processing of stimuli with origins external to the individual. An individual stimulus is created independent of the perceiver, but triggers information processing activities, and a cognitive representation of the stimulus is stored as part of the individual's experience concering the domain. The point here is that our components which form the individuals experience base, such as formal education and work experience precede the generation of cognitive representations. They cannot be seen as reflection of a given level or form of experience because this would require that they change when the experience form or level is manipulated.

### 6.3.3 Strategy content scale

As argued above, a firm's strategy delineates the operating domain of the firm in terms of relative emphasis on cost reduction, differentiation, centrality of innovation to the firm's success and the broadness of the firm's definition of which customers it is to serve, and in which business areas it is to participate. Several measurement procedures have been used in order to assess business unit strategy. Snow and Hambrick (1980) identifyed four general measurement approaches used in strategy research: Investigator inference, self-typing, external assessment and use of objective indicators. Under the investigator inference approach, the researcher collects large amounts of data about each organization's strategy. Typically this method is used in case research with rich access to archive data, accounting data and in depth interviews with managers in the organization. Based on a theory driven analysis of these data, the investigator makes inferences about the organization's strategy and in some cases classifies the organization into one strategic group. One major shortcoming associated with this measurement approach is that it is rather resource consuming, and limits the number of organizations to be investigated within a normal research budget. The self-typing approach uses exclusively managers' own characterizations of their organization's strategy. One frequently used variation of this approach is to use verbal descriptions of strategic types, e.g. according to Miles and Snow's (1978) scheme or Porter's (1980) scheme, and ask the managers to classify their organization into one category. Another frequently used variation is to ask managers to report to what degree the organization holds traits which are assumed to be associated with certain strategic types. The first of these variations has the limitation that it may artificially sort organizaitons into prespecifyed categories which might not represent strategic differences between organizations in a valid way. Several authors have recently come to believe that the strategies of organizations are the product of different emphasis on important underlying dimensions (e.g. Venkatraman and Grant, 1986). For instance, it has been argued that the sharp distinction between cost leader strategies and differentiator strategies proposed by Porter (1980) not neccessarily exists. Cost leader strategists, it is believed, differ from differentiators in their relative emphasis on cost control and efficiency, rather than being the only organizations concerned with costs. In the same vein, also cost leader strategists try to differentiate their offerings in order to achieve some

uniqueness in the buyers' perception. Classification of organizations into prepecifyed categories makes it impossible to assess the validity of the classification scheme itself.

The external assessment approach uses ratings of individuals external to the focal organizations (e.g. competitors, consultants or others) on strategy dimensions or similarity to prespecified strategic types. The measurement instrument used under this approach is often similar to the one used under the self-typing approach.

The final approach, objective indicators, differs from the others in that it does not rely on perceptual information. Instead, it uses objective indicators assumed to reflect dimensions of organization and domain associated with the firms belonging to one strategic group. This approach has been prevailing in research on the PIMS database which has made many contributions to the strategy field (e.g. Buzzell and Gale, 1991).

In this study, I have chosen to use the self-typing approach in order to measure business strategy. This choice is justified by the aspects of business strategy hypothesized to affect environmental orientation of managers. As was discussed above, business strategy provides a context for deciding which parts of the environment are crucial to the goal achievement of the firm (e.g. Hüff, 1982). Different managers in a given firm can have somewhat different perceptions of the firm's strategy (both the intended and the realized strategy) in the same manner as they perceive other domains differently. It is their perception of the strategy pursued by the firm that will affect their environmental orientation, not some objectively measured strategy. Because of this, it seems less appropriate to use external judges, objective indicators or researcher's inference in order to assess the firm's strategy. These measurement approaches could possibly provide more objective measures of the firm's intended or realized strategy but objectivity of strategy measures is not an issue in this dissertation.

The most important criterium for selecting measurement approach is that the measure captures the individual manager's perception of the firm's strategy no matter how subjective and biased this perception might be. The same argument is proposed in order to justify why I have not combined several measurement approaches in order to assess

convergent validity. The convergence between several measures does not provide further information on manager's perception of their firm's strategies. The choice between categorical scaling of strategies and continuous scaling of strategy dimensions fell on the latter because increased criticisms have been raised against categorization of firms into prespecified types using nominal scales. Nominal scales can be considered acceptable in early stages of a knowledge development process, but does not permit analyses of differences within a strategic group (Venkatraman and Grant, 1986). If business strategy is best captured by firms' positions in a multidimensional space with axes representing important dimensions of their attempts to achieve competitive advantage (e.g. relative emphasis on differentiation and cost control), nominal scales are clearly inadequate. In order to measure the strategy of the firms, a total of 10 items was used. The scale is reported in Appendix 1. Below can be found one example illustrating items in this scale along with the leading text.

It is common practice to differentiate between firms based on their approach to achieving competitive advantage. Some firms compete by having lower costs than the industry average. Other firms compete by differentiating their products and thereby are perceived by customers as different from other firms. Another group base their competitiveness on being first movers with regard to development and marketing of new products. The most common is, however, perhaps that firms lack a clear competitive strategy and are pursuing more than one strategy simultaneously. If you work in such a firm you probably do not feel that your firm belongs to any of these "pure" categories.

Please state to what degree you agree with the following statements by indicating with a circle that alternative which best describes your firm.

> Our competitive advantage stems from the fact that we continously search for areas where we can reduce our costs compared to the competitors.

-5 -4 -3 -2 -1 0 1 2 3 4 5

### 6.3.4 Strategy process scale

Many firms engage in comprehensive strategy development efforts. Typically these efforts include analyses of external environments (customers, competitors, industries, macroeconomic trends and so forth) and internal analyses of different dimensions of the firm, formulation of strategic plans along with procedures for their implementation and design of control systems in order to facilitate the monitoring of implementation and outcomes of the strategy change. The purpose of the external analyses is to indentify developments which can create threats to performance or opportunities for improved performance of the firm. A major purpose of the internal analyses is to clarify the firm's strength vis à vis competitors on dimensions which contribute to value perceived by customers. Internal analyses also help identification of areas for improvement of structures, staffing and processes in the firm. Based on these analytical activities, the firm often reformulates its strategy and develop short and long term goals in order to orient firm members' decisions and behavior in concordance with the new strategy. Strategy development processes in firms differ with respect both to their level of formality and comprehensiveness (e.g. Frederickson and Mitchell, 1984). Formality refers to whether formal procedures are developed for the different phases of the process (analyses, formulation, implementation, control).

Comprehensiveness refers to the total effort in terms of time and resources devoted to the process. Conceptually, the two dimensions are closely related as high levels of formality are expected in firms who have adopted the strategic management process fully, and devote considerable resources to its implementation.

The scale developed to capture the strategy development process of the firms, attempted to capture both aspects of the process. As argued by authors previously working on measurement issues of strategy development, a comprehensive strategy development effort should produce clear goals for sustaining competitive advantage, goals for entry into new markets, creation of organizational structures responsible for the process, implementation through incentive systems reflecting the strategy and a clear conception of the firm's comparative strengths. Important activities involved in the process, such as environmental

scanning are also expected to be undertaken if a firm has adopted strategy development as a managerial tool (Lindsay and Rue, 1980; Mintzberg, 1981; Wood and LaForge, 1981; Frederickson and Mitchell, 1984; Piëst, 1990). The strategy process scale contained 10 items, one of which is given below. The remainder is reported in the appendix.

In this section I wish to measure to what degree your firm has implemented a formalized strategy development process. I would like to underscore that a firm link between planning sophistication and firm performance has not yet not been established.

> In this firm we contineuously scan the external environments in order to identify opportunities to improve our competitiveness.

-5 -4 -3 -2 -1 0 1 2 3 4 5

This strategy process scale is considered to be reflective, because responses to the items reflect different leves of strategy process comprehensiveness and formalization.

# CHAPTER 7

## CONSTRUCT VALIDATION

In order to assess the construct validity of the scales, empirical analyses of convergent, discriminant and nomological validity was conducted. Convergent validity refers to whether repeated attempts to measure the same construct using different methods yield approximately the same results. In this thesis I originally planned to use conjoint measurement in addition to ordinary scales in order to measure the dependent variable, environmental orientation. If this plan had been fully implemented the data could have been used to explore convergent validity of the environmental orientation scales. The amount of time and effort this demanded from the respondents, however, obliged me to drop this second measurement procedure. It could be argued that the first part of the data collection phase, when I was present during the interviews, is employing a method different from the postal interviews. It was judged that these methods were too similar to justify a multi-method analysis in the spirit of Campbell and Fiske (1959). The only evidence of convergent validity reported in this work is by consequence the degrees of reliability in the scales and the pattern of factor loadings obtainted. A reliability analysis could be argued to provide evidence on the convergent validity of the measurement instrument. This kind of analysis does not assess the convergence of results across methods, but rather convergence across different variations of the same method represented by items with different wordings tapping into different parts of the construct domains. In this section I first report the results of exploratory factor analyses of the multi-item Likert-type scales. Construct validity is discussed in terms of dimensionality of the factor solutions, as all scales have an expected dimensionality - and patterns of factor loadings. The pattern of factor loadings are taken to provide some evidence of convergent and discriminant validity, although the original conceptualization of these validities was assumed to require repeated studies using different methods (see above and Campbell and Fiske, 1959).

## 7.1 Factor analyses results - Convergent and discriminant validity

### 7.1.1. Environmental orientation scales

Initially, a confirmatory factor analysis of the cognitive environmental orientation scale was run. The choice of confirmatory factor analysis rather than exploratory factor analysis was made because according to theory, the environmental orientation construct was expected to be five-dimensional. The results of this confirmatory factor analysis, however, were not satisfactory in terms of fit between correlations among items and a theoretical five-dimensional structure. High chi-square value (235.8), along with a very low p-value ($p < .00001$) indicate low measurement model fit. Thus, it was decided to run an exploratory factor analysis in order to revise the measurement model.

Table 7.1 below shows the results of varimax orthogonal rotations of exploratory factor analyses with principal component extraction (PCA) for the cognitive part of the environmental orientation scales. PCA was used because it is a technique which generates a reduced set of variates that accounts for most of the variability in the original set of variables. PCA generates variates as linear combinations of the original variables. The number of linear combinations (principal components) equals the number of original variables, but dimensionality reduction is achieved because a subset of these principal components which retains most of the variability is used for further analysis. In order to determine the number of principal components to be used, only principal components with eigenvalues larger than one are usually retained. The logic behind this criterion is that when eigenvalue of a principal component equals one, it accounts for the same amount of variation as the original variables (Dillon and Goldstein, 1984). In order to interpret the substantial meaning of the principal components, the pattern of variable loadings on the principal components is inspected. Variable loadings in PCA are correlations between original variables and the principal components. Thus, variables with high correlations "belong" to the linear component and should be used for labeling the component. Variable codes given in paranthesis refer to the item's location in the questionnaire (Appendix 1).

**Table 7.1 Factor results (loadings) of the cognitive environmental orientation scales**

| | Factors | | | | | | |
|---|---|---|---|---|---|---|---|
| Item/Scale | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| **Customer orientation** | | | | | | | |
| CUSTOR1 | | | | | | | |
| V2 | **.551** | -.283 | -.349 | .227 | .049 | -.485 | -.274 |
| CUSTOR2 | | | | | | | |
| V13 | **.842** | .121 | -.090 | .013 | .163 | .061 | .024 |
| CUSTOR3 | | | | | | | |
| V18 | **.481** | .065 | -.059 | .428 | .095 | -.185 | .222 |
| CUSTOR4 | | | | | | | |
| V25 | **.860** | .141 | -.074 | .017 | .117 | -.016 | .030 |
| **Supplier orientation** | | | | | | | |
| SUPPOR1 | | | | | | | |
| V5 | -.266 | **.666** | -.144 | -.185 | -.155 | -.121 | -.416 |
| SUPPOR2 | | | | | | | |
| V15 | .238 | **.734** | .026 | .139 | .015 | .013 | .118 |
| SUPPOR3 | | | | | | | |
| V19 | .242 | **.840** | .121 | .098 | -.068 | .009 | -.008 |
| SUPPOR4 | | | | | | | |
| V23 | -.095 | **.722** | -.331 | -.053 | .245 | -.230 | .032 |
| **Public sector orientation** | | | | | | | |
| PUBOR1 | | | | | | | |
| V4 | -.422 | -.157 | **.700** | -.186 | -.081 | -.012 | -.054 |
| PUBOR2 | | | | | | | |
| V14 | -.001 | -.086 | **.765** | .210 | -.075 | .134 | -.071 |
| PUBOR3 | | | | | | | |
| V17 | -.001 | .078 | **.812** | -.047 | .141 | .012 | -.113 |
| PUBOR4 | | | | | | | |
| V21 | -.197 | .007 | **.452** | .170 | .451 | -.368 | .214 |

**Table 7.1** (continued)

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| **Competitor orientation** | | | | | | | |
| COMPOR1 | | | | | | | |
| V12 | .260 | .036 | .008 | **.660** | .045 | .352 | -.041 |
| COMPOR2 | | | | | | | |
| V20 | .088 | .002 | .140 | **.743** | .069 | -.037 | -.012 |
| COMPOR3 | | | | | | | |
| V22 | -.229 | .078 | -.135 | **.714** | .292 | -.124 | .118 |
| **Technology orientation** | | | | | | | |
| TECHOR1 | | | | | | | |
| V11 | .187 | -.123 | .253 | .039 | **.600** | .315 | -.374 |
| TECHOR2 | | | | | | | |
| V16 | .262 | .293 | .124 | .282 | **.554** | .095 | -.008 |
| TECHOR3 | | | | | | | |
| V24 | .194 | -.058 | -.165 | .154 | **.841** | .114 | .016 |
| **Residual factors** | | | | | | | |
| RES1 | | | | | | | |
| V1 | -.080 | -.188 | .060 | .053 | .256 | .823 | -.007 |
| RES2 | | | | | | | |
| V3 | .070 | -.008 | -.165 | .047 | -.060 | .001 | .911 |
| Eigenvalues | 3.85 | 2.89 | 2.31 | 1.64 | 1.40 | 1.21 | 1.03 |
| % variance explained | 19.3 | 14.4 | 11.6 | 8.2 | 7.0 | 6.0 | 5.1 |

As indicated in Table 7.1, factor analysis of the environmental orientation scale yielded seven factors when a criterion of eigenvalue >= 1 was applied. A scree test did not reveal a distinct cutoff point when eigenvalues were plotted against number of factors, so I decided to use the seven factor solution as a point of departure for evaluating the dimensionality, convergent and discriminant validity of the scale. This solution accounted for 71.6 % of the total variance in the original variables. According to my measurement model, five rather than seven factors was expected - i.e. one factor for each environmental sector. The seven factor solution is a result of two items, V1 and V3, which did not correlate strongly with the other five factors. These two items belong to the part of the scale which asked the managers to allocate the time of an environmental analyst to be

employed in their firms. The items were expected to load on the technology orientation factor and the competitor orientation factor respectively. It can be argued post hoc, that managers who believe that other sectors are more important for the goal achievement of the firm, still may want additional information on technology and competition. Because their own time and resources are allocated to customers, suppliers and public agents, they would like other organizational members to monitor the technology and competitor sectors in order to detect threats and opportunities with origins in these sectors. This partly explains the lack of correlation between the items and their factors, but does not explain why the managers would allocate the environmental analyst's time in agreement with their perceptions of importance with regard to the other sectors. With the exception of these two items, the scales behaved as expected with regard to dimensionality. With this exception, all items related to one environmental orientation had low (less than .32) loadings on other factors, a result which is interpreted as evidence of fairly high discriminant validity of the scales and their underlying constructs.

The patterns of factor loadings generally provide some evidence of both convergent and discriminant validity. Items assumed to measure orientation towards one sector generally have high loading on one and only one factor. The only significant exception from this general conclusion is item V18 (CUSTOR3) which was intended to measure customer orientation, but which load on both the customer orientation and the competitor orientation factors. The exact wording of this item was as follows: "If I had more resources, I would have increased or market research and market analysis activities". Post hoc, the wording of this item is seen as ambigous with regard to which external sector the question refers. A market is a meeting place for the firm and its customers, but also an arena where the firm comes in close contact with its competitors. Market analyses and market research could easily been interpreted as the gathering and analysis of both customer and competitor information. This would explain the item's loading on both factors.

Table 7.2 below shows the results of the factor analysis of the behavioral environmental orientation scales. As for the cognitive orientation scales, I expected a five factor solution, with each dimension representing behavior towards each of the five environmental sectors. As shown in the table, a four factor solution was obtained, using eigenvalue >= 1 as a

criterion. The four empirical factors, however, do not consistently represent four environmental sectors. Only three of the four factors can be interpreted as behavioral reflections of environmental orientations towards specific sectors. These are factors one, three and four, which represent customer orientation, supplier orientation and technology orientation, respectively. No clear public sector orientation or competitor orientation factors emerged from the analysis.

**Table 7.2. Factor results (loadings) of the behavioral environmental orientation scales**

| | Factors | | | |
|---|---|---|---|---|
| Item/Scale | 1 | 2 | 3 | 4 |
| **Customer orientation** | | | | |
| CUSTOR1B | | | | |
| V6 | **.776** | .307 | -.023 | -.090 |
| CUSTOR2B | | | | |
| V26 | **.871** | -.042 | -.360 | .215 |
| **External orientation** | | | | |
| EXTOR1B | | | | |
| V8 | -.155 | **.710** | -.199 | .044 |
| EXTOR2B | | | | |
| V9 | .277 | **.729** | .109 | -.219 |
| EXTOR3B | | | | |
| V10 | -.108 | **.507** | -.151 | .531 |
| **Supplier orientation** | | | | |
| SUPPOR1B | | | | |
| V7 | .438 | .448 | **.549** | .178 |
| SUPPOR2B | | | | |
| V27 | -.101 | -.212 | **.925** | .055 |

**Table 7.2** (continued)

| | | | | |
|---|---|---|---|---|
| **Technology orientation** | | | | |
| TECHOR1B | | | | |
| V10 | -.108 | .507 | -.157 | **.531** |
| TECHOR2B | | | | |
| V29 | -.613 | .010 | -.215 | **.430** |
| | | | | |
| Eigenvalues | 2.59 | 1.87 | 1.40 | 1.22 |
| % variance explained | 25.9 | 18.7 | 14.0 | 12.2 |

These four factors accounted for 70.8 % of total variance in the original variables. Factor number two in this table, is interpreted as a general external orientation factor, as items from both public sector, competitor and technology sector scales loads on this factor. Thus, it represents a general behavior where substantial time is spent in contact with external agents regardless of to which sector these agents belong. In terms of convergent and discriminant validity, this scale performes far poorer than the cognitive scale. Several items have high loadings on more than one factor and, generally, loadings are smaller than for the cognitive environmental orientation scale.

### 7.2 Strategy content scale

The strategy content scale was hypothesized to form five dimensions. A confirmatory factor analysis of this scale was run and yielded satisfactory results (Chi-square = 6.30; p = .28). Considered alone, this indicates that a five dimensional strategy scale fits the patterns of correlations between item responses. The fifth factor, however yielded an eigenvalue below one (eigenvalue = .82). This indicates that a more parsimoneous four-factor solution should be considered. Because of this ambigous result, an exploratory factor analysis was performed.

Table 7.3 below, shows the factor results from the business strategy scale. The strategy scale was assumed to contain five dimensions, one for each of the strategic types domain defender, analyzed, prospector, cost leader and differentiator. Table 7.3 shows that a factor

solution with only four factors accounted reasonably well for a large proportion of the variance in the original item responses. The results indicate that Miles and Snow's (1978) prospector strategy was perceived to be similar to Porter's (1980) differentiator strategy.

**Table 7.3 Factor results (loadings) of the strategy content scales**

| | Factors | | | |
|---|---|---|---|---|
| Item/Scale | 1 | 2 | 3 | 4 |
| **Prospector/differentiator** | | | | |
| PROSP1 | | | | |
| V50 | **.729** | .042 | -.284 | -.077 |
| PROSP2 | | | | |
| V51 | **.723** | -.191 | .106 | -.006 |
| PROSP3 | | | | |
| V56 | **.721** | .252 | -.187 | .227 |
| PROSP4 | | | | |
| V57 | **.859** | .027 | .095 | .060 |
| **Domain Defender** | | | | |
| DEF1 | | | | |
| V53 | .263 | **.825** | .029 | .031 |
| DEF2 | | | | |
| V54 | .085 | **-.819** | -.026 | .275 |
| DEF3 | | | | |
| V58 | -.207 | **.593** | .000 | .419 |
| **Cost leader** | | | | |
| COST1 | | | | |
| V49 | -.162 | -.104 | **.873** | -.052 |
| COST2 | | | | |
| V55 | .064 | .162 | **.893** | .108 |
| **Analyzer** | | | | |
| AN1 | | | | |
| V52 | .085 | -.082 | .051 | **.874** |
| V58 | -.207 | .593 | .000 | **.419** |
| Eigenvalues | 2.58 | 1.85 | 1.62 | 1.06 |
| % variance explained | 25.8 | 18.5 | 16.2 | 10.6 |

The four factors together accounted for 71 % of total variance in the original sample of variables.

Conceptually, this four factor solution makes sense because Porter's differentiator resembles Miles and Snow's prospector in terms of the emphasis put on innovation in this type of firms. According to Miles and Snow, the prospectors main capability is that of finding and exploiting new product and market opportunities. The prospector's domain is typically broad and in a continous state of development. Instead of competing on low costs or product superiority within a narrow product market domain, the prospector enters new and emerging markets where margins typically are higher. Porters differentiator, although it could operate within a relatively narrowly defined domain, share the reliance on innovation with the prospector. The key to the differentiator's success, is the creation of unique offerings through active use of research, technology, design and marketing. High loadings on one factor for each of the items, indicate that a reasonable level of discriminant and convergent validity has been achieved for the strategy content scales.

It was argued above that perceptual measures of strategy were more adequate than objective measures because the individual manager's perception of the firms strategy was hypothesized to influence his environmental orientation. Thus, it was argued, if there is a difference between the firm's strategy and the manager's perception of it, the latter would influence environmental orientation more than the former. Nevertheless, strategy has been conceived of as an organizational trait. Because of this, even though managers could differ with regard to their perception of their firms' strategies, the average correlation between the strategy perceived by managers from the same firm should be higher than the average correlation between the strategy measures from different firms. In order to explore this, I correlated the strategy variables for managers from the same firm. This yielded a correlation of .29, which is significant at $p < .001$ ($n = 84$). In order to provide a point of comparison, the correlation among strategy measures for a random sample of managers from different firms was computed. This yielded a correlation of -.022, which is significantly smaller than the previous correlation ($p < .001$; one-tailed comparison). These results provide some indications that the perceptual strategy measures to some degree measures an organizational characteristic and not only the individuals' perceptions of the

organizations' strategies. The common variance in perceived strategy for managers from the same firms is, however, quite small (approximately 9 %). This indicates that the managers' responses to the strategy scales are influenced by other factors than the organizations' strategies. Because of this, it can be questioned whether strategy as an organizational trait in fact has been captured by this measurement procedure. Due to this ambiguity, in the following parts of this dissertation I have chosen to refer to this variable as **perceived strategy content** rather than strategy content.

### 7.3 Strategy process scale

Table 4 below shows the results of exploratory factor analysis of the strategy process scale. The factor analysis yielded three factors with eigenvalues greater than one, which indicate that three dimensions of the strategy development process has been identified. The results, however, show that the responses to one item, V60, are fairly unrelated to the other responses, and thus has been isolated as one factor. This item asked whether the firm had specific short term goals for its activitites. Information obtained during the first phase of the data collection, when I was present during the completion of the questionnaires, indicated that this question was understood by some of the respondents as: Does the firm have short term goals and **not** long term goals for its activities, and should probably have been deleted from the questionnaire. It was however retained during the whole data collection, as I did not want to alter the instrument during the process.

**Table 7.4 Factor results (loadings) of the strategy process scale**

| | Factors | | |
|---|---|---|---|
| Item | 1 | 2 | 3 |
| STR1 | | | |
| V62 | .545 | .541 | -.036 |
| STR2 | | | |
| V67 | .826 | .149 | .051 |
| STR3 | | | |
| V68 | .764 | .153 | .118 |
| STR4 | | | |
| V69 | .876 | .174 | .118 |
| STR5 | | | |
| V62 | .545 | .541 | -.036 |
| STR6 | | | |
| V63 | .283 | .689 | -.021 |
| STR7 | | | |
| V64 | .390 | .619 | -.079 |
| STR8 | | | |
| V65 | -.101 | .788 | .097 |
| STR9 | | | |
| V60 | .049 | -.003 | .945 |
| Eigenvalues | 4.15 | 1.13 | 1.04 |
| % variance explained | 41.5 | 11.3 | 10.4 |

A second factor analysis without item STR9 was run in order to explore the effect of this item. This analysis, reported in Table 7.4b below yielded only one factor with eigenvalue > 1. This result is consistent with the à priori argument that strategy process formalization and comprehensiveness are conceptually and empirically related. The results are also consistent with the findings of Frederickson and Iaquinto (1989) who measured comprehensiveness in several elements of the strategy development process. Their findings indicate that if firms engage in a comprehensive strategy process, they devote time and other resources to all activities normally present in such a process, and not to only one or a few of these activities. The measurement model of these authors hypothesized the process comprehensiveness to form four dimensions - one for each step in the conceptualized process - while factor analysis of responses only yielded only one factor.

**Table 7.4b. Factor results of the strategy process scale without item STR1**

| Item | Factor 1 |
|---|---|
| STR2 | .618 |
| STR3 | .764 |
| STR4 | .668 |
| STR5 | .692 |
| STR6 | .478 |
| STR7 | .695 |
| STR8 | .706 |
| STR9 | .657 |
| STR10 | .872 |

This solution accounted for 45.8 % of the variance in the original variables. The eigenvalue of this principal component was 4.12. With the exception of item STR6, all loadings are considered high, giving further support to the conclusion of unidimensionality of the scale. Item STR6 asked whether the achievement of strategic goals was used to reward the employees. The development of a reward system linked to important strategic goals and mile stones is often suggested as an important element in a sophisticated strategy implementation program. The normatve attractiveness of such a connection between remuneration and goal achievement does not, however, imply that all organizations have recognized the importance of facilitating the implementation through design of reward systems. The relatively low loading of STR6 on the general strategy process factor, indicates that in these two industries, fairly formal and sophisticated strategy development processes with regard to goal development, organization and analysis can be found without the use of this implementation instrument. In other industries, in which the general level of sophistication in strategy processes is higher, item STR6 probably would have loaded higher on this general factor.

## 7.4 Reliability of measures

Table 7.5 below show item-to-total correlations, number of items, coefficient alpha, and for the constructs measured by multi-item reflective scales. Item-to-total correlations are the correlations between individual items and the summated scales to which the items belong. This correlation can be interpreted as how well an individual item measures the theoretical contruct.

As can be inferred from the table, a reasonably high level of reliability has been obtained for the environmental orientation (cognitive part), business strategy content and strategy development process comprehensiveness scales. Alpha levels for most constructs exceed .70 (Nunnally, 1978). The competitor orientation and technology orientation constructs have somewhat lower reliabilities (.63 and .66) respectively. The levels, however, still are judged to be acceptable given the exploratory nature of this study (Nunnally, 1978).

**Table 7.5 Internal consistency of measures**

| Scale | Item-to-total correlations | Number of items | Alpha |
|---|---|---|---|
| Environmental orientation (Cognitive scales) | 20 | | |
| Customer | .429 CUSTOR1<br>.639 CUSTOR2<br>.447 CUSTOR3<br>.724 CUSTOR4 | 4 | .76 |
| Supplier | .508 SUPPOR1<br>.459 SUPPOR2<br>.639 SUPPOR3<br>.598 SUPPOR4 | 4 | .75 |
| Public sector | .476 PUBOR1<br>.528 PUBOR2<br>.597 PUBOR3<br>.332 PUBOR4 | 4 | .70 |

**Table 7.5** (Continued)

| | | | |
|---|---|---|---|
| Technology | .272 TECHOR1<br>.536 TECHOR2<br>.421 TECHOR3<br>.559 TECHOR4 | 4 | .66 |
| Competitor | .123 COMPOR1<br>.383 COMPOR2<br>.385 COMPOR3<br>.388 COMPOR4<br>.412 COMPOR5 | 5 | .63 |
| Environmental orientation<br>(Behavioral scales) | | 10 | |
| Customer | .543 CUSTOR1B<br>.543 CUSTOR2B | 2 | .70 |
| Supplier | .248 SUPPOR1B<br>.248 SUPPOR2B | 2 | .40 |
| Public sector | .323 PUBOR1B<br>.323 PUBOR2B | 2 | .49 |
| Technology | .19 TECHOR1B<br>.19 TECHOR2B | 2 | .32 |
| Competitor | .161 COMPOR1B<br>.161 COMPOR2B | 2 | .28 |

With exception of the customer orientation scale, all behavioral scales of environmental orientation resulted in very low reliabilities. This result is probably due to that individual managers are not in a position to allocate their time freely according to their perception of what constitute important contingencies for the firm. Research on leader roles and leader behavior indicate that substantial parts of managers' time is spent on reacting to initiatives from other individuals internal and external to the firm (e.g. Mintzberg, 1973). One part of the behavioral environmental orientation scale measured how much time the managers

spend in direct contact with different external agents. This question probably measures more the manager's position in the firm than his personal environmental orientation. Marketing managers spend relativly more time in contact with customers than purchasing managers who in turn spend more time in contact with suppliers. This, however, does not neccessarily imply that the time they spend in contact with their particular segments of the environments is directly proportional to the relative importance attributed to the segment. The other part of the behavioral environmental orientation scale measured the information processing behavior of the managers. This measure is much less influenced by role-related allocation of attention than the previous and more related to the underlying environmental orientation of the managers. Due to this low levels of scale reliability, the behavioral measures will only be used in order to assess nomological validity of the cognitive environmental orientation scales.

As should be expected from the factor results (Tables 7.3 and 7.4) the internal consistency of the perceived strategy content and strategy process scales is quite high. Results of the reliability analysis of these two scales are given in Tables 7.6a and 7.6b below.

**Table 7.6a. Reliability of perceived strategy content scales**

| Scale | Item-to-total correlations | Number of items | Alpha |
|---|---|---|---|
| Perceived strategy content scale | | | |
| Prospector/differentiator | | | |
| | .557 PROSP1 | 5 | .76 |
| | .488 PROSP2 | | |
| | .566 PROSP3 | | |
| | .659 PROSP4 | | |
| Domain defender | | | |
| | .574 DEF1 | 2 | .73 |
| | .574 DEF2 | | |
| Cost leader | | | |
| | .613 COST1 | 2 | .76 |
| | .613 COST2 | | |
| Analyzer | | | |
| | - AN1 | 1 | - |

Coefficient alphas, ranging from .73 to .76 for the perceived strategy content scales indicate that satisfactory levels of reliabilities has been achieved for these measures. Because only one item loaded strongly on the **analyzer** dimension of the strategy scale, no reliability indicator could be computed for this dimension. Based on these results, it was judged that measurement properties of the perceived strategy content scales were good enough to permit subsequent hypothesis testing.

Table 7.6b (below) report on the reliability of the strategy process scale.

**Table 7.6b. Reliability of strategy process scale**

| Scale | Item-to-total correlations | Number of items | Alpha |
|---|---|---|---|
| Strategy process scale | | | |
| | .507 STR2 | 9 | .83 |
| | .657 STR3 | | |
| | .551 STR4 | | |
| | .579 STR5 | | |
| | .363 STR6 | | |
| | .578 STR7 | | |
| | .589 STR8 | | |
| | .552 STR9 | | |
| | .642 STR10 | | |

As indicated in the table, a relatively high coefficient alpha was found for this measure. Thus, it was judged that the measurement properties of the strategy process scale permit further hypothesis testing involving this variable.

## 7.5 Nomological validity

Nomological validity involves the assessment of how measures show relationships with other measures. Thus, in order to assess nomological validity of measures, one needs a theory relating the measures to other variables as well as measures of those variables. It is also obvious that the theory must be strong in the sense that previous research has established an unequivocal relationship between the two constructs. In the absence of such a theory, negative findings in the assessment of nomological validity might be the result of invalid expectations with regard to relationships between the two variables rather than weak measures.

The only measures for which a strong theoretical relationship could be specifyed in this dissertation were the cognitive and behavioral parts of the environmental orientation scales. Thus, nomological validity can only be explored for the environmental orientation measures.

An important issue in cognitive psychology is to what extent, and under what conditions people can be expected to behave in accordance with their cognitions (e.g. Neisser, 1976; Harvey and Weary, 1984). Although it is generally believed that people's beliefs, causal attributions, schemas, attitudes and categories influence subsequent behavior, exceptions are easily found. According to Harvey and Weary (1984) the individual either is influenced to take action via the attribution process, or acquires the potential to act because of this process. Kelley (1973) stated that "Causal attributions play an important role in providing the impetus to action and decisions among alternative courses of action". A large body of empirical research in social cognitive psychology also seem to support the intuitively plausible assumption that cognitions affect behavior (e.g. Snyder and Gangestad, 1981; Yarkin et al., 1981; and the review by Quattrone, 1985). Thus, it seems reasonable to expect that managers' behaviors with regard to environmental segments will be influenced by their beliefs concerning the relative importance of those segments. Customer oriented managers will spend more time in contact with customers and process more information concerning customers. Managers who believe that public sector is vital to the goals of the firm are likely both to keep in contact with politicians and

administrators as well as monitor the public sector by processing information concerning this environmental segment.

Table 7.7 below shows zero-order correlations between the combined measures of behavior towards the five environmental segments (time spent in contact with individuals in the segment pluss proportion of environmental information processed stemming from the segment) and the cognitive environmental orientation measures. High positive correlations are taken as indicators of nomological validity of the environmental orientation measure.

**Table 7.7 Nomological validity of the environmental orientation measure (n=88)**

| Behavioral scale | Customer | Supplier | Competitor | Publ.sector | Techn. |
|---|---|---|---|---|---|
| Cognitive scale | | | | | |
| Customer | .28* | | | | |
| Supplier | | .64** | | | |
| Competitor | | | .73** | | |
| Publ.sector | | | | .78** | |
| Technology | | | | | .11 |

*: $p < .01$
**: $p < .001$

As shown in the table, all correlations are positive, as expected. Most of the correlations are very high, and highly significant. Only the correlation between behavior and cognitions towards the technology sector is not significant at a satisfactory level. Taken together, these results indicate that a reasonable level of nomological validity has been achieved for the cognitive environmental orientation measures.

# CHAPTER 8

# VARIABLE CONSTRUCTION AND PRELIMINARY DATA ANALYSIS

In this chapter, I first describe the procedures used in order to construct variables based on the questions asked in the questionnaire, along with some descriptive statistics for each variable. Second, I report the results of two manipulation checks performed in order to check content of formal education and the level of external uncertainties in the two industries.

## 8.1 Environmental orientation

A scale for each dimension of the environmental orientation construct was constructed by summating the items loading on each of the five dimensions. Before summating these items, the responses were transformed to z-scores. This was done because two types of items was used for the measurement of environmental orientation. Recall from Chapter 7 that in addition to three Likert-type items per dimension, the allocation of an environmental analyst's time was used in order to measure the environmental orientation of managers. As the Likert-type item scores ranged from -5 to 5, and the environmental analyst scale ranged from 0 to 100, this transformation was necessary in order to give the items equal weight in the combined measure. Table 8.1 below shows, means, standard deviation, maximum and minimum values along with skewness and kurtosis indicators for the five dimensions of the environmental orientation variable.

**Table 8.1 Descriptive statistics of the environmental orientation scales**

| Orientation | Mean | S.D. | Kurtosis | Skewness | Max | Min |
|---|---|---|---|---|---|---|
| Customer | .20 | 2.4 | .81 | -.76 | 4.9 | -4.7 |
| Technology | .07 | 2.3 | .09 | -.75 | 4.1 | -5.8 |
| Competitor | -.02 | 2.2 | .97 | -.60 | 4.7 | -6.5 |
| Supplier | .09 | 3.5 | -.23 | -.31 | 8.4 | -7.9 |
| Publics | -.13 | 3.3 | .96 | 1.10 | 9.9 | -6.1 |

From the maximum and minimum values, along with the standard deviation estimates, it is clear that the variables in fact captures differences between managers as to their orientation towards the different environmental sectors. Means close to zero for each variable is a result of the z-score transformations of the raw data. The kurtosis and skewness indicators are below or close to one for all variables, indicating that the sampling distributions of the variables are close to normal distributions, which encourages further statistical testing of hypotheses.

### 8.1.1 Relative importance of environmental sectors

In order to permit an exploration of the relative importance of environmental sectors, I contructed variables reflecting allocation of attention among the different sectors. Three Likert-type measures of orientation towards each of the five environmental sectors was used in the questionnaire. The sum of scores within one sector was taken as an indicator of the importance attributed to that sector. As orientation towards each sector was measured by an equal number of items, using the same scale, these combined scores can be viewed as importance weights and can be used to compare the importance attributed to each sector. Table 8.2 below shows means, standard deviation, maximum and minimum values, along with skewness and kurtosis indicators for these importance weights.

**Table 8.2. Descriptive statistics of the environmental orientation importance weight scales**

| Dimension | Mean | S.D. | Kurtosis | Skewness | Max | Min |
|---|---|---|---|---|---|---|
| Customer | 11.2 | 3.4 | .59 | -1.10 | 14 | 1 |
| Technology | 6.4 | 4.9 | .09 | - .74 | 21 | -6 |
| Competitor | 4.6 | 4.9 | 1.72 | - .74 | 30 | -15 |
| Supplier | 4.7 | 5.6 | -.54 | .54 | 24 | -9 |
| Public sector | .3 | 5.5 | -.49 | .02 | 26 | -14 |

Fairly high standard deviations, along with large differences between maximum and minimum scores indicate that these measures capture inter manager differences in

importance attributed to the different environmental sectors. Low to moderate skewness and kurtosis indicators does not indicate serious violations of distributional assumptions underlying use of statistical tests involving these variables.

As shown in the Table, the customer sector is by far considered the most important environmental segment. This is consistent with previous findings on environmental scanning and orientations. Aguilar (1967) found a similar focus on customers, as did Gronhaug and Lines (1989).

### 8.1.2 Balanced or focused environmental orientation

Some of the hypotheses formulated in Chapter 4 concern whether different managers chose to handle their cognitive capacity problem by focusing on one or a few sectors, or distributing their attention evenly across sectors. In order to test these hypotheses, a measure of concentration of attention is needed. The concentration measure used is a well known indicator from the industrial economics field, the Herfindahl index (e.g. Tirole, 1988). The Herfindahl index, originally developed in order to represent supply-side concentration in industries, is the sum of squared market shares, and approaches 1 as the share of one firm approaches the total market. As shares become more evenly distributed across participant firms, the index approaches 1/n, where n = number of firms. If an individual manager's total environmental attention is measured as the sum of scores across the five environmental sectors, this total score can be used as a basis for computing the degree of focus or balance across sectors using the Herfindahl index:

$$C_i = \Sigma^n \alpha_i^2,$$

where C= Concentration of attention

$\alpha$= Importance indicator of customer sector, technology sector etc divided by the total environmental attention indicator

The items used in order to compute the concentration index (C1) were the environmental analyst time allocation questions. This question directly forced the respondents to make

tradeoffs between the five environmental segments to be monitored.

Table 8.3 below shows the mean, standard deviation, maximum and minimum, skewness and kurtosis of the environmental orientation concentration variables.

**Table 8.3. Descriptive statistics of the environmental orientation concentration variable**

| Mean | S.D. | Kurtosis | Skewness | Max | Min |
|---|---|---|---|---|---|
| .283 | .07 | 1.6 | 1.3 | .51 | .54 |

Very low standard deviations shed some doubt on whether this indicator really captures differences between managers with regard to their distribution of attention towards few or many environmental sectors. Some differences are, however, captured as can be inferred from the differences between maximum and minimum values of the concentration indices. Recall that the variable can only vary between .20 and one when the Herfindahl index is used. The concentration index shows acceptable levels of skewness and kurtosis.

## 8.2 Perceived strategy content

A scale for each dimension of perceived business strategy, as conceptualized à priori and identified from the factor analysis was constructed by summating the raw scores on items belonging to each dimension. Some descriptive statistics of these strategy variables are reported in Table 8.4 below.

**Table 8.4. Descriptive statistics of perceived strategy variables**

| Variable | Mean | S.D. | Kurtosis | Skewness | Max | Min |
|---|---|---|---|---|---|---|
| Prospector/differentiator | 4.0 | 7.6 | -.08 | -.36 | 18 | -18 |
| Domain D. | - .6 | 5.5 | -.91 | .20 | 10 | -10 |
| Cost L. | 2.9 | 4.4 | -.43 | -.39 | 10 | -8 |
| Analyzer | - .3 | 2.9 | -.99 | -.14 | 5 | -5 |

Fairly high standard deviations, together with a wide range of responses to the perceived strategy scales provide some evidence that the scales have captured differences in managers' perceptions of strategies followed by the firms included in this data set.

Differences in means between the strategic dimensions is consistent with previous findings which indicate that firms in any given industry are not evenly distributed across strategic groups. Generally, all strategy variables are characterized by low levels of kurtosis and skewness, which indicate distributions close to the normal distribution.

### 8.3 Strategy process comprehensiveness

As was concluded after presenting the results of the factor analysis and reliability analysis of the strategy process items, only one variable is sufficient in order to account for most of the variance in the raw scores intended to capture dimensions of the firms' strategy development processes. By consequence, all items reflecting the firms' strategy process were summated into one combined variable. Table 8.5 below show some descriptive statistics for this variable.

**Table 8.5 Descriptive statistics for the strategy process scale**

| | Mean | S.D. | Kurtosis | Skewness | Max | Min |
|---|---|---|---|---|---|---|
| Strategy process comprehensiveness | 21.9 | 12.9 | .87 | -.71 | 45 | -24 |

As shown in the table, a high degree of variation among repondents has been achieved on the perception of their firms' strategy development process comprehensiveness. This, together with low skewness and kurtosis indicate that the variable is fit for testing hypoteses concerning the relationship between strategy processes and environmental orientation.

## 8.4 Managerial background and experience

Various indicators of managers' information processing experience and their hypothesized relationship between environmental orientation have been described in previous chapters. Common to these indicators are that they were measured by single item scales. Consequently, construct validation and reliability analyses were not performed for these measures. The following tables, however show their distribution in order to assess to what degree variation across respondents has been achieved.
Table 8.6 shows the distribution of management positions held by respondents in the sample.

**Table 8.6 Managerial positions of respondents**

| **Position** | **% of all managers** |
|---|---|
| CEO | 51% |
| Marketing | 17% |
| Technical | 17% |
| Financial | 10% |
| PR | 2% |
| Purchasing | 2% |
| Total | 99 % |
| | (n=88) |

As shown in the table, more than 50 % of all managers held top positions in their organizations. Most of remaining half held positions as marketing, technical and financial managers. Four respondents held positions as PR managers and purchasing managers. Although most of the respondents belong to only four managerial positions, this is judged adequate for testing hypotheses concerning the relationship between environmental orientation and management position. Dearborn and Simon (1958) used managers from three positions in order to explore their theory about departmental biases. Walsh (1988) categorized his sample of managers into four positional categories as will be done for hypothesis testing purposes in this study.

Table 8.6 below, shows some descriptive statistics for years since graduation, age and years in firm for the sample.

**Table 8.7 Descriptive statistics for background characteristics of respondents**

| Variable | Mean | S.D. | Kurtosis | Skewness | Max | Min |
|---|---|---|---|---|---|---|
| Years since graduation | 16.7 | 9.5 | -.68 | .43 | 40 | 2 |
| Age | 41.7 | 8.6 | .33 | .75 | 67 | 28 |
| Years in firm | 9.6 | 8.9 | 2.35 | 1.6 | 45 | 1 |

As shown in the table, the mean amount of post graduation work experience for the respondents were 16.7 years. Amount of work experience, however, varied from a maximum of 40 years for the oldest managers to only 2 years of post graduation experience. This indicates that the sample contains managers with large differences with regard to their amount of work experience after having finished their formal education. These differences will be used in order to assess whether the effect of formal education on environmental orientation decays as cognitive representations from processing of work experiences are formed (H6). The descriptive statistics for respondends' age and years in firm also show that considerable variation has been obtained for these variables. The age of respondents range from 67 years to 28 years and the average time spent in the present firm is 9.6 years, with a maximum value of 45 years, while the most recently employed manager had spent only one year in the firm.

The managers were also asked to report whether they had experienced economic crises, bankruptcies or significant new opportunities - and to attribute these outcomes to different environmental sectors. The distribution of answers is given in Table 8.8 below.

**Table 8.8 Attribution of reasons for crises, bankruptcies and significant new opportunities by sector and event (% of total attributions)**

| Sector | Crises | Bankruptcies | Opportunities | Total |
|---|---|---|---|---|
| Technology | 6% | 6% | 10% | 8% |
| Customer | 25% | 37% | 27% | 26% |
| Competition | 21% | 12% | 23% | 22% |
| Public | 12% | 12% | 6% | 9% |
| Supply | 20% | 6% | 16% | 17% |
| Internal | 16% | 41% | 18% | 19% |
| Total | 100% | 100% | 100% | 100% |

As shown in the table, managers in the sample had experienced crises, bankruptcies and opportunities caused by events in all environmental sectors. Relatively few, however, had experienced bankruptcies. For attributed causes of crises, three environmental sectors, customer sector, competitor sector and supply sector get most of the blame. Together, these three sectors account for 66% of all causal attributions. Opportunities has mostly been experienced due to events in the same three sectors. Changes in technology sector, however is also seen as a fairly frequent cause of new opportunities.

## 8.5 Manipulation checks: Educational content and environmental uncertainty

In order to test the relationship between environmental uncertainty I chose to compare the environmental orientation of managers from two industries. Although à priori agruments to support the assumption that fish industry and ship building industry differ with regard to uncertainty in some environmental sectors, it was decided that a direct measurement of these differences would strengthen the study. A questionnarie was thus designed in order to compare the level of environmental uncertainty in the two industries, sector by sector. This questionnaire was administered to a sample of experienced industry observers and industry analysts from one research institute (SNF), a bank (DnB) and one industry development division in a county at the coast of Norway (Møre og Romsdal

Fylkeskommune). The results of this manipulation check is presented in Table 8.9 below.

**Table 8.9 Univariate significance of differences in environmental uncertainty, fishing industry versus shipbuilding industry - by environmental sector.**

| | Fishing ind. | Shipbuilding ind. | | | |
|---|---|---|---|---|---|
| Sector | Mean (SD) | Mean (SD) | t-value | d.f | p(two-tailed) |
| Supplier | 1.35 (7.89) | 10.65 (3.65) | -3.66 | 13 | .003 |
| Customer | 9.57 (5.11) | .93 (6.71) | 3.69 | 13 | .003 |
| Technology | 6.85 (3.01) | 1.86 (4.59) | 2.91 | 13 | .012 |
| Public | 1.28 (8.47) | 4.21 (6.01) | -1.09 | 13 | .294 |
| Competition | 3.36 (4.29) | 2.86 (5.16) | .25 | 13 | .808 |

The results from this manipulation check, nicely confirm the validity of the à priori arguments concerning differences in environmental uncertainty advanced in the previous chapter. As was argued, this check indicates that supply sector uncertainty is much higher in the fishing industry than in the ship building industry. The difference in mean scores, 1.36 for the fishing industry versus 10.64 for the shipbuilding industry is both large and highly significant. The levels of customer and technological uncertainties appear to be higher in the shipbuilding industry. This result is also consistent with the à priori reasoning above. With regard to public sector and competitive uncertainty, the differences between the two industries are neither very large in real terms nor statistically significant.

In order to check the real differences in content between formal educational programs, a

questionnaire, designed to map the content of various programs was administered to a sample of civil engineers, economists and graduates from the Norwegian School of Fisheries Science. This questionnaire directly asked to what degree the educational programs emphasised demand- related, technology-related, competition-related, public sector related or supplier-related topics, and thus improved the students' understanding of these environmental sectors. The scales ranged from No emphasis (-5) to main focus (5) on Likert-type scales. The results of this check are presented in Table 8.10 below. The first part of this table, Table 8.10a compares the programs of civil engineers and masters of fisheries science.

**Table 8.10a. Overall and univariate results of differences in content between Civil engineer and Master of Fisheries Science educational programs**

Overall difference - MANOVA results

| Wilks | F | df | p |
|---|---|---|---|
| .04 | 9.34 | 10,24 | < .0001 |

Univariate differences - ANOVA results

| Sector | F | d.f. | p |
|---|---|---|---|
| Customers | 29.49 | (2,15) | .000 |
| Competitors | 7.90 | (2,15) | .005 |
| Technology | 5.61 | (2,15) | .015 |
| Public | 15.62 | (2,15) | .000 |
| Suppliers | 4.82 | (2,15) | .024 |

As indicated in the table, overall differences between the content in the two educational programs are highly significant ($p < .0001$). The series of univariate analyses of variance indicate that differences in content concerning all five environmental sectors are significant. The master study in fisheries science appears to cover topics related to customers, technology, competition and public sector more comprehensively than the civil

engineers program. With regard to technology, however, the civil engineer program is significantly more comprehensive than the marster of fisheries science program.

Table 8.10b below shows the results of the comparison between the civil engineers and the civil economist programs.

**Table 8.10b. Overall and univariate results of differences in content between Civil engineers and civil economist educational programs**

Overall difference - MANOVA results

| Test name | Wilks | F | df | p |
|---|---|---|---|---|
| | .03 | 10.79 | 15,58 | <.0001 |

Univariate differences - ANOVA results

| Sector | F | df | p |
|---|---|---|---|
| Customers | 20.95 | (3,25) | <.0001 |
| Competitors | 12.76 | (3,25) | <.0001 |
| Technology | 11.63 | (3,25) | <.0001 |
| Public sector | 8.12 | (3,25) | .001 |
| Suppliers | 3.32 | (3,25) | .036 |

Table 8.10b indicates that the overall difference in how the two educational programs cover these five environmental topics is highly significant ($p < .0001$). According to the univariate results, customers, competitors, public sector and supply sector affairs are more comprehensively treated in the civil economist program, while technology related topics are treated more in depth in the civil engineer program.

Table 8.10c below shows the results of the comparison of content between the civil

economist and Master of Fisheries science programs.

**Table 8.10c. Overall and univariate results of differences in content between Master of fisheries science and civil economist educational programs**

Overall difference - MANOVA results

| Test name | Wilks | F | df | p |
|---|---|---|---|---|
| | .29 | 6.39 | 5,13 | .003 |

Univariate differences - ANOVA results

| Sector | F | d.f. | p |
|---|---|---|---|
| Customers | .62 | (1,17) | .439 |
| Competitors | 3.18 | (1,17) | .092 |
| Technology | 12.43 | (1,17) | .003 |
| Public | 6.20 | (1,17) | .023 |
| Suppliers | 7.25 | (1,17) | .015 |

Also the overall differences between these educational programs are statistically significant. The univariate results, however, indicate no significant difference in the comprehensiveness of customer related matters in the two programs. Mean responses for civil economists on this item was 1.45, while the Masters of Fisheries science scored an average of .75. With regard to competition focus in the educational programs they differ, but the difference is small (average score for civil economists = 2.45 versus .85 for Masters of Fisheries Science) and not as statistically significant as the other differences (0 = .092).

When considered together, the first manipulation check indicates that I have succeded in the selection of two industries which provide contrast on the levels of uncertainty associated with environmental sectors. The second manipulation check also indicates that the contents of the managers' educational backgrounds differ with regard to the comprehensiveness with which they treat topics related to the environmental sectors included in this study.

# CHAPTER 9

## HYPOTHESIS TESTING

In this chapter I present the results of the hypothesis tests done in order to validate the research model. The tests fall into three categories:

1)Relationships between manager experience and environmental orientation,
2)Relationships between organizational characteristics and environmental orientation

and

3)Relationships between environmental characteristics and environmental orientation.

The selection of statistical techniques for the testing of these hypotheses was guided by the principle of choosing the simplest possible techniques providing the possibility of valid testing procedures. Central to this thesis has been the position that environmental orientation should be defined as the pattern of relative importance which managers attribute to environmental sectors. This requires a testing procedure which handles a multidimensional dependent variable. Representation of environmental orientation as a construct consisting of several interconnected dimensions (a multidimensional construct) was judged more in line with the theoretical content of the concept than viewing it as a collection of more or less independent unidimensional constructs. Multivariate analysis of variance (one and n-way MANOVA), and its extension to multivariate analysis of covariance (MANOCOVA) are techniques which are developed to permit analyses of data where the dependent variable is multidimensional.

In addition to the morphological similarities between MANOVA and the theory, substantial arguments for using this technique for hypothesis testing can be forwarded. According to Hair **et al.** (1984), treating a multidimensional dependent variable as a

collection of unidimensional variables - using t-tests or ANOVA - when the dimensions in fact are correlated can produce both Type I (rejection of a true null-hypothesis) and Type II errors (acceptance of a false null hypothesis; see also Wind and Denny, 1974).

Conceptually, the dimensions of the environmental orientation construct should be correlated as it has been argued that cognitive limitations would force a manager who focuses on one sector to reduce his attention towards other sectors. One of the measures of environmental orientation, the environmental analyst measure is also constructed in a way that produces correlation between the responses to individual sectors (constant sum measure). Table 9.1 below show the zero-order correlations between the five dimensions of the environmental orientation measure.

**Table 9.1 Zero-order correlations between dimensions of environmental orientation**

| Dimension | Supplier | P.sector | Customer | Technology | Competitor |
|---|---|---|---|---|---|
| Supplier | x | | | | |
| P.sector | -.1763 | x | | | |
| Customer | -.0918 | -.174 | x | | |
| Technology | -.0358 | .0934 | .1728 | x | |
| Competitor | -.0258 | -.1119 | .4894** | .1766 | x |

** indicates correlation coefficient significant on $p < .001$ ($n = 89$)

As shown in the table, most correlations between the environmental orientation dimensions are low and insignificant ($p > .05$). One correlation, however, the correlation between customer focus and competitor focus is large, positive and highly significant ($p < .001$). This correlation could create problems of the kind mentioned above if the dimensions were analysed only with univariate techniques.

## 9.1 Environmental uncertainty and environmental orientation

The general argument relating environmental uncertainty to environmental orientation was twopartite. First, it was argued that managers must devote attention to environmental sectors which change in a frequent and unpredictable manner (e.g. Thompson, 1967; Duncan, 1972). As the uncertainty level increases in a sector, it quickly becomes impossible to base one's mental model of that sector's state by relying on how things have been before. An individual manager's mental model of that sector has contineously to be updated in order to form a valid representation. Second, it was argued that sectors changing in a frequent and unpredictable way are salient to the managers and therefore attract attention. Unpredictability of the changes is the same as to say that the new states in the sector does not conform with the managers' mental representations. This incongruence, by itself attracts attention. My way of testing the relationship between environmental uncertainty and environmental orientation was to explore whether the environmental orientation of manager from two different industries differs. The fishing industry and the shipbuilding industry were chosen because, à priori, the were believed to differ with respect to environmental uncertainty in several sectors. This assumption was also supported by the manipulation check. Table 9.2 below show the results of a MANOVA with industry as independent variable.

**Table 9.2 Environmental uncertainty and environmental orientation: One-way MANOVA-results**

a) Multivariate results

| Wilks | F | df | p |
|---|---|---|---|
| .85 | 2.9 | 5,81 | .018 |

**Table 9.2 (continued)**

b) Univariate differences - one tailed tests (difference in focus by industry)

| | X1 | X2 | F | d.f. | p |
|---|---|---|---|---|---|
| Supplier focus | -1.00 | 1.5 | 12.6 | (1,85) | <.001 |
| Public sector focus | .06 | -.38 | .4 | (1,85) | .275 |
| Customer focus | .24 | .15 | .9 | (1,85) | .431 |
| Technology focus | .38 | -.33 | 2.1 | (1,85) | .080 |
| Competitor focus | -.07 | .04 | .1 | (1,85) | .408 |

X1: Mean sector focus for managers in the shipbuilding industry
X2: Mean sector focus for managers in the fishing industry

The first part of Table 9.2 shows the results of the test whether managers from the two industries differ with regard to their environmental orientation. The p-value ($p = .018$) indicate that it is highly unlikely that the observed differences are due to chance alone. This test is, however, a relatively weak test of the hypothesized relationship between environmental uncertainty and environmental orientation, because it does not relate environmental orientation directly to the levels of uncertainty in the two industries. Industries differ on many dimensions (e.g. Porter, 1980; Dess, Ireland and Hitt, 1990), and inter-industry differences in environmental orientation might have been produced by other differences than different levels of environmental uncertainty. A stronger set of tests is whether the pattern of attention distribution across environmental sectors follows the levels of uncertainty in the same sectors. The second part of Table 1 provides information on whether this seems to be the case. The conclusions from both the à priori reasoning in Chapter 5 and the manipulation checks (Table 11, Chapter 7) indicate that the fishing industry experience higher levels of supplier uncertainty than the shipbuilding industry. The shipbuilding industry experience higher levels of customer and technological uncertainty than the fishing industry. The levels of public sector and competitive uncertainties in the two industries are similar. With respect to the level of supplier focus, managers in the fishing industry indeed allocate more attention to this sector than managers in the shipbuilding industry ($p < .0001$). This difference provide some support for the hypothesized relationship between environmental uncertainty and environmental orientation. Managers from the shipbuilding industry focus more on the external

technology sector than their peers from the fishing industry (p= .08), which is also consistent with the hypotheses. With respect to the hypothesized relationship between customer uncertainty and customer focus, I did not find support for this (p= .431). The lack of difference in environmental focus towards the public sector and the competitor sector support the hypothesized relationship between environmental orientation and environmental uncertainty because the levels of uncertainty in these two sectors do not seem to differ substantially.

The distribution of education among managers in the two industries, however, differ (chi square = 39.7, $p < .000001$). A potential threat to valid inference about relationship between environmental orientation and environmental orientation is that the differences found between the two industries is caused by different educational backgrounds of the managers. In order to check for this possibility, I conducted a to-way MANOVA, main effects only, with industry and education as design variables (factors). This analysis tests for differences in environmental orientation across industry groups when the effects of education have been removed. The results of this two-way MANOVA are reported in Table 9.3 below. As the purpose of this analysis was to test the relationship between environmental uncertainty and environmental orientation, only the significance levels for the industry factor are reported.

**Table 9.3 Environmental uncertainty and environmental orientation: Two-way MANOVA-results with education as second factor**

a) Multivariate results

| Wilks | F | df | p |
|---|---|---|---|
| .82 | 3.1 | 5,70 | .014 |

**Table 9.3 (continued)**

b) Univariate differences - one tailed tests (difference in focus by industry, whith control for interindustry differences in education)

| | F | d.f. | p |
|---|---|---|---|
| Supplier focus | 15.0 | (1,74) | <.001 |
| Public sector focus | .06 | (1,74) | .403 |
| Customer focus | .09 | (1,74) | .381 |
| Technology focus | .31 | (1,74) | .287 |
| Competitor focus | .09 | (1,74) | .382 |

As can be inferred from the overall test of significance (first part of Table 2), difference in environmental orientation between the two industries is still significant when the effect of education on environmental orientation has been removed. In fact the multivariate F increased slightly, from 2.9 to 3.1 (p = .014). This provides further support for the hypotheses concerning a relationship between environmental uncertainty and environmental orientation.

If we turn to the univariate tests, however, the picture is less clear when the effects of education are controlled for. The conclusion with regard to supplier focus still seem to hold, i.e. higher levels of supplier uncertainty seem to have produced higher levels of supplier focus among managers in the fishing industry. The higher level of technology focus in the shipbuilding industry, however, seem to have been accounted for by differences in education between managers from the two industries. A sharp decrease in p-value (from p=.08 to .287) indicates this. Still, no significant differences in customer focus is revealed, a result which is inconsistent with the hypothesized relationship between environmental uncertainty and environmental orientation. No significant differences between the industries with respect to competitor focus and public sector focus, is a finding consistent with the hypothesized causal mechanism.

The samples of managers from the two industries also differ with respect to the distribution of positions held in their organizations. Although this difference is smaller than the difference in educational background, it is still significant (chi square = 8.8, p =.03). As managerial position previously has been believed to affect various aspects of

manager cognition (Dearborn and Simon, 1958; Ireland **et al.**, 1987; Walsh, 1988), differences in position between managers from the two industries represent a potential threat to the valid inference that environmental uncertainty is related to environmental orientation. A three-way MANOVA was performed in order to control for differences in the distribution of managerial positions between the two industry samples. The results from these analyses did not change the conclusions from the first two-way MANOVA and are not reported in detail here.

If the relationship depicted in Chapter 4 is valid, that is if managers form mental representations of their environments, and if these representations have some degree of resistance towards change, one would expect that managers with experience from other industries retain traces of their previous industry experience even when they enter a qualitatively new industry environment. What distinguishes the fishing industry from most other industries is the very high level of supply uncertainty. Whichever other industry a fishing industry manager comes from, it is by consequence likely that he experienced lower levels of supply uncertainty in his previous environments. One would therefore expect that fishing industry managers with experience from other industries hold a less pronounced supplier orientation than managers with experience only from the fishing industry. In order to test this hypothesis, managers with experience from outside the fishing industry were compared to their peers with only fishing industry experience with regard to intergroup differences in supplier orientation. A MANOVA with environmental orientation as dependent variable, and experience outside the fishing industry as factor indicated highly significant differences ($p = .04$) between the groups. This indicates that managers with experience from other industries have significantly different environmental orientations than managers with experience only from the fishing industry. Differences in supplier orientation was also significant ($p = .02$) and in the expected direction. Average supplier orientation for managers with only experience from the fishing industry had significantly higher supplier orientation (mean = 2.5, S.D. = 2.5) than managers with experience from other industries (mean = -.19, S.D. = 4.2).

Over all, these results show that substantial inter-industry differences in environmental

orientation exist. Further, some support has been found for the notion that differences in uncertainty associated with individual external sectors account for some of these differences.

## 9.2 Environmental orientation and individual experience

Several forms of individual experience were measured in this thesis. Broadly, they can be categorized into two classes: Formal educational experience and work experience. Among the forms of work experience measured, experiental effects of management position, experience of salient environmental shocks and experience from other industries will be explored. First, however, I explore whether the educational background of the managers has an enduring impact on their environmental orientation.

### Education

Table 9.4 below report the results from a one-way MANOVA analyzing the direct effect of education on environmental orientation.

**Table 9.4. Effect of Education on Environmental orientation: One-way MANOVA results**

a) Multivariate results

| Wilks | F | df | p |
|---|---|---|---|
| .57 | 2.3 | 20,73 | .002 |

**Table 9.4. (continued)**

b) Univariate differences - one tailed tests (difference in focus by education)

| | F | d.f. | p |
|---|---|---|---|
| Supplier focus | 3.2 | (4,77) | .010 |
| Public sector focus | .7 | (4,77) | .285 |
| Customer focus | 3.7 | (4,77) | .005 |
| Technology focus | 4.2 | (4,77) | .002 |
| Competitor focus | 2.3 | (4,77) | .004 |

The first part of Table 9.4 shows the results of the overall test of difference in environmental orientation between educational groups. The high F-value value indicate that managers with different educational backgrounds have significantly different environmental orientations. The second part of the table shows that differences between educational groups are significant with regard to the managers' orientation towards all sectors except the public sector. Our hypotheses were based on the premise that the educational content would create more or less comprehensive mental representations of environmental sectors. The level of comprehensiveness in these representations was believed to positively affect the managers' orientation towards the sectors. Differences in educational content would then affect the environmental orientation of managers. The test above does only provide support for the idea that managers' environmental orientations vary systematically with educational background. A stronger test of the causal mechanism creating these differences would be to explore whether managers with education stressing a particular sector also tend to have a strong orientation towards that sector. The preliminary data analysis in the previous chapter indicated that the main educational backgrounds of the managers differed with respect to their content in a manner which is recapitulated in Table 9.5 below.

**Table 9.5. Differences in Educational content between Civil engineers (Ceng), Civil Economists (Ciec) and Masters of Fisheries Science (MFS).**

| | Educational Program | | |
|---|---|---|---|
| | Ceng | Ciec | MFS |
| **Environmental Sector** | | | |
| Supplier | M | M | H |
| Public Sector | L | M | H |
| Customer | L | H | H |
| Technology | H | L | M |
| Competitor | L | H | M |

L = Low comprehensiveness, M = Medium comprehensiveness, H = High comprehensiveness.

The classifications into High, Medium and Low are relative to other educational programs, and should only be interpreted across rows, not down the colomns. E.g. M M H in the first row indicates that the teaching of topics relevant for understanding the supplier sector was not very comprehensive in the Civil engineers and Civil economist programs, while it was important and comprehensively covered in the Master of Fisheries Science program.

According to these results, a series of directional hypotheses concerning differences in orientation towards environmental sectors were tested. The results of these tests are reported in Table 9.6 below and in the text following the table.

**Table 9.6. Differences in Environmental Orientation by Education (Means)**

| | Educational Program | | |
|---|---|---|---|
| | Ceng | Ciec | MFS |
| **Sector orientation** | | | |
| Supplier | -.85 | -.66 | 1.9 |
| Public Sector | .51 | -.95 | .19 |
| Customer | .25 | 1.1 | -1.9 |
| Technology | .91 | -.17 | -2.19 |
| Competitor | -.5 | .67 | -1.2 |
| | n=25 | n=28 | n=11 |

According to differences in educational content, Masters of Fisheries Science were expected to focus more on the **supply** sector than managers with the two other educational backgrounds. The difference which was found with regard to supplier orientation is in the expected direction, and highly significant (MFS vrs Ceng: p =.002; MFS vrs Ciec: p= .005

based on one-tailed tests). Differences in **public sector** orientation between Civil economists and Masters of Fisheries Science were not significant ($p = .18$), nor was the difference between Masters of Fisheries Science and Civil engineers ($p = .41$). Difference in public sector orientation between Civil engineers and Civil Economists, however, was found to be significant ($p = .06$), but in the opposite direction of what was expected from the estimated differences in educational content.

Analyses of differences in **customer orientation** revealed that Civil economists focus more on customers than the two other professions. This is consistent with the relative emphasis on customer affairs in the three educational programs. Surprisingly, however, although it was in the expected direction, the difference between Civil economists' and Civil engineers' customer orientation was not significant ($p = .12$). The difference between Masters of Fisheries Science's and Civil economists' customer orientation was in the expected direction and highly significant ($p = .006$). The difference between MFS and Ceng customer orientation was significant ($p = .03$), but in an opposite direction of what was expected. With regard to **technology** orientation, Civil engineers focus significantly more on this sector than the two other professions ($p = .005$ and $p = .03$, respectively) . This is consitent with a model of environmental orientation which sees an individual's orientation as a result of prvious information processing experience.

The difference between Master of Fisheries Science and civil economist technology orientation also is significant ($p = .04$), but in a direction opposite of the expectations. Finally, several significant differences were found with regard to competitor orientation of the managers in this sample. The expectation was that Civil economists should be more sensitive to **competitor** questions because competition and competitive behavior is treated in more depth during their education. This was found, as Ciec's focused more on competitors than both other professions ($p =.02$ and $p = .02$ for both differences). It was also expected that Masters of Fisheries Science would focus more on competitors than their peers with a training as Civil engineers. My findings, however, indicate no difference between these two professions with respect to their competitor orientation.

As industry previously was found to have a significant impact on environmental

orientation, it was judged neccessary to control for industry membership in order to validate these conclusions. This was done by testing for differences in environmental orientation by education **within** each of the two industries. The results from these analyses are reported in Table 9.7 below. The first part of the table reports manova results with environmental orientation as dependent variable by education, for each of the two industries. The groups are Masters of Fisheries Science versus Civil economists for the fishing industry, and Civil economists versus Civil engineers for the shipbuilding industry. This is because the sample of managers from the fishing industry does not contain Civil engineers; and the sample of managers from the shipbuilding industry does not contain Masters of Fisheries Science. Dependent variables in this test are the environmental orientation variables. The empirical null-hypotheses are: 1)Environmental orientations of managers with Master of Fisheries Science degrees and managers with Civil economist degrees - both working in the fishing industry - are equal and 2) Environmental orientations of managers with Civil engineer degree and managers with Civil economist degree - both working in the shipbuilding industry - are equal.

**Table 9.7. Environmental orientation by education: Fishing industry and Shipbuilding industry managers analysed individually**

MANOVA-results - Fishing industry (MFS versus Ciec)

| Wilks | F | df | p |
|---|---|---|---|
| .50 | 4.6 | 5,23 | .005 |

MANOVA-results - Shipbuilding industry (Ceng versus Ciec)

| Wilks | F | df | p |
|---|---|---|---|
| .61 | 3.7 | 5,28 | .011 |

As indicated by the first part of Table 9.7, education seems to have a systematic impact on environmental orientation even when the effects of industry are controlled for ($p = .005$ for the fishing industry and $p = .011$ for the shipbuilding industry). This lends further support to the hypothesis that environmental orientation is affected by formal education. In

order to validate the causal mechanism proposed, however, a link to the educational content has to be established. This is done by examining the directions of differences in sectorial focus between the educational groups. Results from the testing of differences by sector is reported in the second part of Table 9.7, significance levels for differences and comments to the results are give below this table.

**Table 9.7. (continued)**
Univariate results: Environmental orientation by education (means)

a)Fishing industry

| | **Educational Program** | | |
|---|---|---|---|
| | Ciec | MFS | p-value |
| **Sector orientation** | | | |
| Supplier | .60 | 2.15 | .088 |
| Public sector | -.40 | -.44 | .486 |
| Customer | 1.24 | -2.2 | .003 |
| Technology | -.15 | -1.9 | .073 |
| Competitor | .65 | -1.6 | .014 |
| | (n=19) | (n=10) | |

b)Shipbuilding industry

| | **Educational Program** | | |
|---|---|---|---|
| | Ciec | Ceng | p-value |
| **Sector orientation** | | | |
| Supplier | -3.3 | -.85 | .023 |
| Public sector | -2.1 | -.51 | .001 |
| Customer | .63 | .25 | .332 |
| Technology | -.23 | .91 | .076 |
| Competitor | .71 | -.50 | .075 |
| | (n=9) | (n=25) | |

As can be seen from the table, Masters of Fisheries Science have on average a higher supplier orientation than Civil Economists, even when industry effects has been controlled for (p =.08). This result lends further support to the hypothesis of a causal relationship between educational content and environmental orientation. Differences in public sector orientation between these two educational groups were not significant, although Civil economists were assumed to focus somewhat less on this sector (M) than Masters of Fisheries Science. Civil economists, on average, tend to focus more on the customer sector

than Masters of Fisheries Science. According to differences in the educational content in these two programs, this result was as expected. Significant differences were also found with regard to the technology orientation in the two groups. Here, however, the difference was in the opposite direction of what was expected, Civil economists have higher technology orientation than Masters of Fisheries Science. Finally, competitor orientation was higher for Civli economists, a result which was an expected consequence of different emphasis on competition in the two programs.

Several significant differences were also found with respect to environmental orientations of Civil economists when compared to Civil engineers (in the shipbuilding industry sample). First, Civil engineers were found to focus significantly more on suppliers than their collegues with training as Civil economists. This result was not expected, as differences in educational emphasis indicate that the groups should be similar in their supplier orientation. With regard to public sector orientation, the results are consistent with the hypothesis, as Civil economists focus significantly more on this sector than civil engineers ($p = .001$). Surprisingly both groups have a similar amount of orientation towards the customer sector of the environments. Civil economists focus more on customers, but the difference between the two educational groups is not significant. Civil engineers focus more on technology than Civil economists, and Civil economists focus significantly more on competitors. These two last results are as expected from the model relating environmental orientation to education.

In all, results strongly support the idea that environmental orientation is consistently and enduringly affected by formal education. Some support has also been found for the assumed causal mechanism relating environmental orientation to educational content.

## 9.4 Departmental bias

The second set of tests explored whether differences in the informational environments surronding managers in different departments of the firm would produce different environmental orientation. As argued by both Dearborn and Simon (1958), and more moderately by Walsh (1988), differences in tasks, goals and information in different department would create local and systematically biased perspectives on the firm and its environments. Four positions were sufficiently represented in the sample to allow testing of this hypothesis: Top managers (TM), marketing managers (MM), technical managers (TecM) and financial managers (FM). The first part of Table 9.8 below (a) shows the results of the test of the general hypothesis stating that managers occupying different positions will hold different environmental orientations (H6). In this test, differences due to industry effects and education are controlled for. In the second part (b), the hypothesis that top managers will hold less concentrated environmental orientations than functional managers is tested (H6a). Testing this hypothesis, statistical control for eventual effects of industry and education was done by 3-way ANOVA. The third part of the table (c) shows the results of the tests concerning environmental focus of particular functional managers (H6b to H6d). These tests were also conducted using 3-way ANOVA in order to control for industry effects and educational effects.

**Table 9.8. Tests for differences in environmental orientation by managerial position**

a) Differences in environmental orientation by position

| Wilks | F | df | p |
|---|---|---|---|
| .65 | 1.3 | 25,69 | .15 |

**Table 9.8.** (Continued)

b) Concentration of environmental orientation - Top versus middle managers

| Source | SS | DF | MS | F | p |
|---|---|---|---|---|---|
| Position | .00 | 1 | .000 | .00 | 1 |
| Education | .02 | 4 | .006 | 1.3 | .3 |
| Industry | .002 | 1 | .002 | .32 | .6 |
| Explained | .025 | 6 | .004 | .89 | .5 |
| Residual | .35 | 75 | .005 | | |
| Total | .38 | 81 | .005 | | |

c) Environmental focus by position

(1) Customer focus - Marketing managers versus other managers

| Source | SS | DF | MS | F | p |
|---|---|---|---|---|---|
| Position | 4.9 | 1 | 4.9 | .93 | .34 |
| Education | 74.8 | 4 | 18.7 | 3.6 | .01 |
| Industry | .09 | 1 | .09 | .02 | .90 |
| Explained | 79.7 | 6 | 13.3 | 2.5 | .03 |
| Residual | 391.7 | 75 | 5.22 | | |
| Total | 471.4 | 81 | 5.82 | | |

(2) Competitor focus - Marketing managers versus other managers

| Source | SS | DF | MS | F | p |
|---|---|---|---|---|---|
| Position | 2.1 | 1 | 2.1 | .5 | .49 |
| Education | 37.9 | 4 | 9.5 | 2.1 | .09 |
| Industry | .6 | 1 | .6 | .1 | .72 |
| Explained | 39.4 | 6 | 6.6 | 1.4 | .21 |
| Residual | 343.2 | 75 | 4.6 | | |
| Total | 382.7 | 81 | 4.7 | | |

**Table 9.8** (Continued)

(3) Technological focus - Technical managers versus other managers

| Source | SS | DF | MS | F | p |
|---|---|---|---|---|---|
| Position | 13.5 | 1 | 13.5 | 2.9 | .09 |
| Education | 68.4 | 4 | 17.1 | 3.6 | .01 |
| Industry | 1.7 | 1 | 1.7 | .36 | .55 |
| Explained | 91.5 | 6 | 15.2 | 3.3 | .01 |
| Residual | 351.8 | 75 | 4.7 | | |
| Total | 443.2 | 81 | 5.5 | | |

The results reported in the first part of Table 9.8 show that the general hypothesis relating environmental orientation to managerial position was not supported (F= 1.3; p= .15). The second part, testing concentration of environmental orientation by managerial position shows that no relationship between these two variables has been found (p >.999). The third set of tests explored whether a relationship between managerial position and sector focus could be detected in the data. Although marketing managers were found to focus somewhat more on customers (means = .65 and .03 respectively) and competitors (means = .26 and -.1, respectively) than other managers, the differences were far from being statistically significant (p =.34 and p = .50). The only marginally significant relationship between managerial position and sector focus found, was between technical managers and technology focus (p = .09). the difference in sector focus in this case, was in the opposite direction of what was expected.

On the whole, these results lend no support to the hypothesis that managerial position is related to environmental orientation of managers.

## 9.5 Environmental shocks and environmental orientation

In the theoretical part of this dissertation, it was argued that if managers form mental representations of their environments by processing experiences, very salient experiences should be detectable after such experiences have been made. It was also argued that crises, bankrupcies and significant opportunities for increasing the businesses goal achievement would constitute very salient experiences to the managers. Together, environmental events producing crises, bankrupcies or great opportunities is termed environmental shocks. In order to test the influence of environmental shocks on environmental orientation of managers, I tapped their experiences of shocks stemming from each of the five environmental sectors described previously. The hypothesis of a relationship between the experience of salient environmental events and the configuration of environmental orientation was tested by exploring whether managers who have experienced environmental shocks from one external sector tend to focus more on that sector than other managers. In Table 9.9 below, the results of these tests are presented. In the first part of the table, multiple t-tests for the relationship between technological shocks and technology orientation are presented. In the following parts, test results for customer shocks, competitor shocks, public sector shocks and supplier sector shocks are presented

**Table 9.9. Comparison of environmental orientation of managers having experienced environmental shocks versus managers without this experience (F, p, means, standard deviations and number of observations).**

| | Crisis | | Bankruptcy | | Opportunity | |
|---|---|---|---|---|---|---|
| | No exp. | Exp. | No exp. | exp. | No exp. | exp. |
| Sector | | | | | | |
| **Technology** | | | | | | |
| Mean | -.001 | 1.2 | .04 | 2.2 | .06 | .14 |
| S.D. | 2.3 | 1.6 | 2.3 | - | 2.3 | 2.1 |
| n | 82 | 5 | 86 | 1 | 75 | 12 |
| t | -1.6 | | - | | -.4 | |
| p | .08* | | - | | .35n.s | |
| **Customer** | | | | | | |
| Mean | .13 | .44 | .23 | -.44 | .03 | .52 |
| S.D. | 2.5 | 2.1 | 2.4 | 2.2 | 2.6 | 2.1 |
| n | 66 | 21 | 83 | 4 | 57 | 30 |
| t | -.56 | | .59 | | -.96 | |
| p | .29n.s. | | .30n.s. | .17n.s. | | |
| **Competitor** | | | | | | |
| Mean | -.13 | .41 | -.06 | 1.8 | -.27 | .53 |
| S.D. | 2.3 | 1.4 | 2.1 | 2.3 | 2.2 | 2.0 |
| n | 69 | 18 | 85 | 2 | 60 | 27 |
| t | -1.3 | | -1.1 | | -1.7 | |
| p | .10* | | .23n.s. | | .005** | |
| **Public Sector** | | | | | | |
| Mean | -.09 | -.44 | -.11 | -1.1 | -.40 | 2.9 |
| S.D. | 3.4 | 3.1 | 3.4 | .11 | 3.2 | 4.2 |
| n | 77 | 10 | 85 | 2 | 80 | 7 |
| t | .33 | | 2.56 | | -2.1 | |
| p | .37n.s. | | .005*** | | .04** | |
| **Supplier** | | | | | | |
| Mean | -.06 | .74 | .02 | 6.2 | -.38 | 1.7 |
| S.D. | 2.9 | 5.3 | 3.4 | - | 3.6 | 2.4 |
| n | 71 | 16 | 86 | 1 | 68 | 19 |
| t | -.59 | | - | | -3.0 | |
| p | .28 | | - | | .002*** | |

"*" indicates p=< .10
"**" indicates p=<.05
"***" indicates p=<.01
"-" indicates that t-tests cannot be performed due to no degrees of freedom.

Very few of the comparisons on sector focus by experience of environmental shocks yielded statistically significant differences. In fact, only 6 out of 15 differences (40 %) were significant at p =.1 or better. Among these, one difference was in a direction opposite of what I expected. Two comparisons were impossible to validate statistically due to zero degrees of freedom.

The results presented in Table 9.9, nonetheless, provide some support for the hypothesized relationship between salient experiences and environmental orientation. Out of the 15 comparisons between environmental orientations of managers who had experienced environmental shocks and managers who had not, 12 (80%) of the differences were in the expected direction. The probability of finding this distribution of mean differences by chance, is only .02. That is, on average, managers who had experienced shocks attributed to one sector tended to focus more on that sector in following periods. Five of these differences are statistically significant at p =.1 or better.

### 9.6 Is work experience moderating the effect of formal education?

As stated in H6 (Chapter 4) it was expected that the link between managers' environmental orientation and their formal education would gradually become weaker as the managers' amount of work experience increased. The logic behind this hypothesis is that it is unlikely that the relative emphasis on various environmental segments in any educational program will perfectly reflect relative importance in a given industry and organization. It was argued that due to the greater recency and salience of direct work experience this experience would dominate education in its impact on managers' environmental orientation. According to this, a negative correlation between amount of work experience and sector focus stemming from biases in educational programs was expected. In order to test this hypothesis, information on the content of three educational programs was used (see Table 8.10 and 9.5 above). This information indicated that the civil engineers program included a strong focus on technology and that both the programs of civil economists and masters of fisheries sciences focused heavily on customers and public sector. According to H6, this bias was expected to decrease with the amount of work experience. As indicators of work experience I used number of years since

graduation and age of managers. Table 9.10 below show simple correlations between sector focus and amount of work experience for these three groups of professionals.

**Table 9.10 Relationship between amount of work experience and sector focus**

a) Civil engineers (n = 23)

| | Age | Years since graduation |
|---|---|---|
| Technology focus | .11 ns | .14 ns |

b) Civil economists and Masters of fisheries science (n = )

| | Age | Years since graduation |
|---|---|---|
| Customer focus | .16 ns | .22 ns |
| Public sector focus | -.34 * | -.31 * |

*: $p < .05$

As shown in the table above, the expected negative correlation between sector focus and amount of experience was not found for technology focus of civil engineers, nor for customer focus of civil economists and masters of fisheries science. In fact correlations were positive which indicates that focus on these sectors increase rather than decrease as managers gain more work experience. However, the correlations are not statistically significant. With regard to public sector focus, the correlations are negative and significant, as expected.

## 9.7 Environmental orientation and perceived organizational characteristics

Environmental orientation was previously hypothesized to be related to both strategy content and compreheniveness of the strategy development process. In this section as preliminary tests I present zero-order correlations in order to explore whether these two types of predictors are systematically related to environmental orientation. Next, I test in detail the hypotheses relating various strategic dimensions of the firms to the

environmental orientation of managers. Then the hypothesized relationships between strategy process comprehensiveness and environmental orientation are tested. The latter tests are performed using one and two-way MANOCOVA.

### 9.6.1 Relationships between perception of strategy content, strategy process and environmental orientation.

In chapter 4 it was argued that managers in firms pursuing different strategies would focus on different sectors of their environments because of difference in importance for the successful implementation of the strategies. It was also argued that the level of sophistication or comprehensiveness in the strategy development process would affect the distribution of attention across environmental sectors. The hypotheses relating strategy content to environmental orientation are recapitulated in Table 9.11 below.

**Table 9.11 Hypothesized relationship between strategy content and environmental orientation**

| Strategic Type | DD | DI/PR | CL | AN | |
|---|---|---|---|---|---|
| Environmental sector | | | | | |
| Supplier | | | | + | |
| Public Sector | | | + | | |
| Customer | - | + | | - | |
| Technology | | + | | | + |
| Competitor | + | | | | + |

DD: Domain Defender, DI/PR: Differentiator/Prospector, CL: Cost leader,
AN: Analyzer

Several cells in the table are empty because no hypotheses relating strategy to sector focus were formulated.

In order to test the hypotheses relating perceived strategy to environmental orientation, a 2-way MANOCOVA was used. MANOCOVA was judged to provide a suitable testing procedure because the dependent variable (environmental orientation) is multidimensional and the independent variables of interest (perceived strategies) are contineous. A potential

threat to the valid inference of relationships between strategy content and environmental orientation from this test procedure might stem from that differences in education has not been controlled for. Education was previously in this chapter reported to impact the environmental orientation of managers. The distribution of education in the two industries is significantly different, and this difference might have produced the results. In order to check for this possibility, a 2-way MANOCOVA with industry and education as factors, and strategy content as covariates was conducted. The results of this analysis is presented in Table 9.12 below.

**Table 9.12. Relationship between strategy content an environmental orientation. 2-way MANOCOVA with controls for industry and education**

a) Multivariate Results

| Wilks | F | df | p |
|---|---|---|---|
| .64 | 1.6 | 20,220 | .06 |

b) Univariate Results

| Dependent Variable | Covariate | Beta | t | p |
|---|---|---|---|---|
| Supplier focus | DI/PR | .23 | 2.1 | .04 |
| | DD | -.28 | -2.5 | .01 |
| | CL | -.09 | -.77 | .45 |
| | AN | .01 | .06 | .95 |
| Dependent Variable | Covariate | Beta | t | p |
| Public sector focus | DI/PR | .02 | .2 | .84 |
| | DD | -.06 | -.5 | .59 |
| | CL | .23 | 2.0 | .05 |
| | AN | .14 | 1.2 | .25 |
| Dependent Variable | Covariate | Beta | t | p |
| Customer focus | DI/PR | .09 | .71 | .48 |
| | DD | .03 | .21 | .84 |
| | CL | .09 | .77 | .45 |
| | AN | -.04 | -.33 | .74 |

**Table 9.12** (continued)

| Dependent Variable | Covariate | Beta | t | p |
|---|---|---|---|---|
| Technology focus | DI/PR | .20 | 1.7 | .09 |
| | DD | .13 | 1.1 | .26 |
| | CL | .23 | 2.1 | .04 |
| | AN | .13 | 1.1 | .27 |
| Dependent Variable | Covariate | Beta | t | p |
| Competitor focus | DI/PR | .09 | .76 | .45 |
| | DD | -.01 | -.12 | .91 |
| | CL | .17 | 1.4 | .15 |
| | AN | .09 | .80 | .43 |

As indicated by the multivariate test, environmental orientation of managers is significantly related to perceived strategy content of their firms. This result provide some support to the general hypothesis about the relationship between the two sets of variables. When turning to the univariate relationships, the picture becomes less clear. Although several significant covariates was found, some had a sign opposite of what was expected and some were outside the hypotheses. Managers in pronounced cost leaders were found to focus significantly more on public sector than managers in firms with less of this strategic trait. This result is consistent with my hypothesis. The assumed tendency of focusing more on suppliers and less on customers, however, was not found. One surprising finding outside the hypotheses was that cost leadership is positively and significantly related to technology focus by the managers in such firms (beta= .23; p=< .04). Cost leadership also seem to be somewhat positively related to competitor focus (beta=.17; p=<.15). Domain defending was assumed to be positively related to competitor orientation and negatively related to customer focus of the firm's managers. No support was found for these two hypotheses. Managers from pronounced domain defending firms were found to focus significantly less on suppliers than managers from firms with less of this trait. Managers from differentiators/prospectors were expected to focus relatively more on customers and technology. With respect to the assumed customer focus of these manager, no support was found (beta= .09; p=.48) for this assumption. With regard to technology focus, however, a positive and significant relationship was found, as expected (beta=.2; p=.09). One more significant positive relationship between differentiators/prospectors and

its managers' environmental orientation was found. Managers in differentiators focused more on suppliers than managers from firms with less of this trait. This finding was, however, not expected. Finally, analyzers were hypothesized to affect their managers' technology focus and competitor focus positively. None of these relationships, nor other significant relationships between the analyzer trait and manager environmental orientation was found.

Overall, although there seems to be a systematic relationship between firm strategy content and manager environmental orientation, only week support has been found for the hypothsized relationships.

In order to test the hypotheses relating managers' environmental orientation to the comprehensiveness of the strategy development process in their firms, a 2-way MANOCOVA was performed. This multivariate analysis of covariance was conducted with industry and education as statistical controls, and the strategy process comprehensiveness measure as covariate. This procedure tests whether the environmental orientation vector centroid is significantly related to strategy process comprehensiveness within treatment groups. The results of this test are reported in Table 9.13 below.

**Table 9.13. Relationship between strategy development comprehensiveness and environmental orientation. 2-way MANOCOVA with industry and education as controls.**

a) Multivariate Results - Within cells regression

| Wilks | F | df | p |
|---|---|---|---|
| .82 | 2.9 | 5,68 | .02 |

**Table 9.13** (continued)

b) Univariate Results

| Dependent Variable | Covariate | | |
|---|---|---|---|
| | Process Comprehensiveness | | |
| | Beta | t | p |
| Supplier focus | -.05 | -.4 | .70 |
| Public sector focus | .12 | 1.0 | .32 |
| Customer focus | .11 | .9 | .34 |
| Technology focus | .40 | 3.7 | .0001 |
| Competitor focus | .06 | .49 | .63 |

As indicated by the high F-value and the low p-value, managers' overall environmental orientation is significantly related to the level of comprehensiveness in their firms' strategy development process. Although no hypotheses were formulated concerning the specific location of the process effect on environmental orientation, univariate results are reported below in the second part of Table 14.

As indicated by the results reported in the second part of Table 14, the only dimension of managers' environmental orientation affected by strategy process comprehensiveness of the firm was the technology focus. This relationship was, large, positive (beta=.40) and highly significant (p =.0001). These results seem to support the general hypothesis that the comprehensiveness of a firm's strategy development process affect the environmental orientation of the firm's managers.

As stated in the hypothesis development chapter, I expected that managers taking part in a comprehensive strategy development process would tend to form a more balanced environmental orientation than managers who had taken part in such a process. In order to test this hypothesis, I conducted a 2-way ANOCOVA with industry and education as factors, the process measure as covariate, and the environmental orientation concentration index as dependent variable. the results of this test is reported in Table 9.14 below.

**Table 9.14. Relationship between environmental orientation balance and strategy development process comprehensiveness.**

| Source of variation | SS | DF | MS | F | p |
|---|---|---|---|---|---|
| Comprehensiveness | .001 | 1 | .001 | .17 | .69 |
| Main effects | | | | | |
| Education | .024 | 4 | .006 | 1.3 | .28 |
| Industry | .003 | 1 | .003 | .69 | .41 |
| 2-way interactions | | | | | |
| Education * Industry | .010 | 2 | .005 | 1.12 | .33 |

As is readily seen from the results reported in Table 9.14 above, strategy development process comprehensiveness was not related to the balance of manager environmental orientation in this study (F =.17; p=.69).

The final hypothesis relating strategy process comprhehensiveness to environmental orientation was that the effect of experience on environmental orientation would be weaker if managers participate in a comprehensive strategy development process. In order to test this hypothesis, I used the results from the analysis of educational effects on environmental orientation. These results show that Masters of Fisheries Science focus more on the supplier sector, civil economists focus more on customers and that civil engineers focus more on technology than their peers with other educational backgrounds. Thus, three tests of this hypothesis would be to explore whether the comprhensiveness of the firm's strategy development process is negatively related to Masters of Fisheries Science's supplier focus, negatively related to civil economists' customer focus and negatively related to civil engineers' technology focus. These tests are implemented by computing zero-order correlations between strategy development process comprehensiveness and supplier focus for MFS's and technology focus for Ceng's respectively. Because there were civil economists in both industries, the last test was implemented by a 1-way ANOCOVA with industry as factor, strategy development process as covariate and customer focus as dependent variable. The results of these tests are reported in Table 9.15 below.

**Table 9.15. Strategy development process as moderator of experience effect**

| | Strategy process comprehensiveness |
|---|---|
| Supplier focus (MFS) | -.31 n.s. (n=11) |
| Technology focus (Ceng) | -.04 n.s. |

| Source | SS | DF | MS | F | p |
|---|---|---|---|---|---|
| Process | 10.4 | 1 | 10.4 | 3.9 | .06 |
| Industry | 4.4 | 1 | 4.4 | 1.7 | .21 |
| Explained | 14.7 | 2 | 7.4 | 2.8 | .08 |
| Residual | 65.6 | 25 | 2.6 | | |
| Total | 80.3 | 27 | 2.9 | | |

As shown in the table, neither of the relationships between strategy process and sector focus for Masters of Fisheries Science nor civil engineers are significant, though they are in the expected direction. The relationship between customer focus and strategy development process for civil economists was significant at a satisfactory level ($r = .37$; $p = .06$). The correlation coefficient, however, was positive, which is the oppsite of what was expected. In all, very little support has been found for the hypothesized moderating effect of strategy development process comprehensiveness on the relationship between experience and environmental orientation.

# CHAPTER 10

# DISCUSSION AND IMPLICATIONS

In this chapter I discuss the results reported in the previous chapter. The discussion is organized in the following manner. First I review the results regarding relationships between environmental orientation and managerial experience. Second, the relationships between organizational strategy and strategy process are reviewed, and commented. Third, I discuss the degree of support for the hypotheses relating environmental uncertainty to environmental orientation of managers. Finally, a general discussion including a revision of the proposed research perspective is made in order to account for results deviating from the hypothesized relationships.

## 10.1 Managerial experience and environmental orientation

Over all, support has been found for the hypothesized relationship between managerial experience and environmental orientation. In particular, the hypotheses relating education to environmental orientation have been strongly supported. When formulating these hypotheses, it was argued that participating in an educational program is one of the most structured and comprehensive experiences an individual is exposed to during adulthood. Although this effect was expected, the positive finding is far from obvious. Previous research on managerial experience has tended to focus on work experience rather than educational experience. In particular, the line of research exploring the effects of fit between managerial characteristics and strategy has focused more on functional and industry setting experience than education (Gupta and Govindarajan, 1984; Szilagyi and Schweiger, 1984, Gupta, 1986). Implicit in this research is the assumption that managers' cognitions and behaviors are more affected by work experiences than less direct experiences such as education. This assumption also seems plausible in the light of some elements of cognitive psychology. Personal experiences have often been defined as more salient than other people's experiences (e.g. Tversky and Kahneman, 1973, Fiske and Taylor, 1991). What is transferred to the individual during education is often other

people's experiences - a process which is sometimes termed vicarious learning. Salient experiences in turn, heavily influence belief formation and retrieval of knowledge from memory, two cognitive processes believed to affect subsequent orientation of attention and information pick-up (e.g. Fiske and Taylor,1991). This line of reasoning would indicate that gradually, as the manager builds up work experience, belief structures formed during formal education could be changed or replaced by beliefs formed after processing of direct work experience. Thus, the persistence of educational effects on environmental orientation is somewhat surprising. The results are, however, readily interpretable within a cognitive psychology framework. As discussed earlier, education form the first belief structures relevant for processing subsequent information concerning organizational environments. Most individuals probably have very incomplete beliefs concerning this domain before they enter an educational program. Because of this, when individuals enter organizations, they use belief structures biased by the content of their educational programs are in order to orient themselves with respect to their organization's environments and to interpret environmental stimuli. As these belief structures influence direction of attention, information pick-up, conceptualization of problems, interpretation, judgement, attributions of causes and other subsequent cognitive processes, beliefs concerning relative importance of environmental segments are preserved even if they are not consistent with more objective characteristics of environments, such as uncertainty or environmental requirements following from the firm's strategy. The graduation from an educational program can thus be interpreted as the starting point of a perceptual cycle (Neisser, 1976), where the individual selectively attend to aspects of the situation for which belief structures are developed, pick up information and interpret its meaning within the frameworks of existing knowledge. The implication of this pattern for research is that education probalby should be more frequently included in studies attempting to understand managerial thinking about a wide range of domains such as problem sensing and problem conceptualization (Dutton and Jackson, 1987; Haley and Stumpf, 1989), perception of the firm's strengths and weaknesses (Ireland et al., 1987), perception of environmental uncertainty (Duncan, 1972; Leblebici and Salancik, 1981, Ireland et al., 1987), interpretation of environmental change (Milliken, 1990), key organizational events (Isabella, 1990) and other combinations of cognitive processes and domains important for the understanding of organizational behavior and performance.

This interpretation also implies that managers' environmental orientations could become seriously biased representations of the relative importance of environmental segments surronding the firm. Managers without training in technology-related subjects could underestimate the importance of monitoring and exploiting technological changes in industries with a high level of technological turbulence. In a similar vein, if the strategy of the firm is highly reliant on technological innovation, managers without such training could be inefficient in the implementation of the strategy because their communication and actions would reveal committment to other environments and other priorities. The apparent stability of environmental orientation also have implications for the efforts needed in order to change beliefs formed in phases prior to the entry into work life. Due to the preservance-mechanisms operating, it is likely that comprehensive changes in belief structures such as environmental orientation seldom occur spontaneously. These results lend some support to authors who have claimed that unlearning should be considered and important activity in the organizational adaptation process (Hedberg, 1981; Nyström and Starbuck, 1984) and who view strategic planning as structured learning processes (De Geus, 1988). Changes in beliefs concerning the relative importance of issues could be called for when managers are promoted from a functional middle-management position to a top management position, after a radical change in strategy or when a manager is transferred to an industry with particular environmental requirements. Research on belief and attitude change clearly show that altering an individual's cognitions is a difficult task due to the self-reinforcing effects of beliefs outlined above. This research has, however, also identified some conditions under which belief change is likely to occur. The results provide some guidelines in cases where it is judged legitimate to interfere with the natural thinking and priority setting of managers. At the general level, processing of new information is the cause of belief change. The processing of new, belief-discepant information occurs when people are motivated and able to engage in message- and issue-relevant thinking (Chaiken and Stangor, 1987). Several situational and individual variables have been found to influence the motivation and ability to engage in processing of this kind of information. At the situational level, personal relevance of the topic, match between information message and prior beliefs, repetition of message and rhetorical presentation of message has been found to enhance information processing (Petty and Cacioppo, 1984; Cacioppo et al., 1982; Cacioppo and Petty, 1985; Burnkrant and Howard,

1984). At the individual level, the tendency to process belief-relevant information has been found to be positively related to prior knowledge about the message topic and the individual's need for cognition (Srull, 1983; Cacioppo et al., 1983). Thus, in order to facilitate individual managers' environmental orientation change, the need for reconfiguration of priorities should be formulated in terms which links the need to areas which the manager could influence, if possible not challenging unneccessarily existing beliefs. The need for new priorities should be communicated repeatedly, e.g. during staff meatings. The effect of rhethorics gives some rationality to the observation that managers often use organizational myths and sagas in order to create and maintain the organization's identity (Clark, 1972; Hedberg, 1974; Jönsson and Lundin, 1977). The effect of need for cognition on the unfreezing of belief structures indicate that the creation and use of perception of crisis or need for change also could be expected to facilitate change in environmental orientation.

Even though education was found to have an enduring effect on environmental orientation, some support has been found for effects of work experiences. Although the correlation between particular experiences and environmental orientation was not statistically significant in most cases, the pattern of relationships does not seem to be due to chance. In general, managers who had experienced environmental shocks tended to focus more on the attributed source of the shock than managers without this experience. This finding indicate that environmental orientation of managers is subjected to change in response to direct experience with the environments which is consistent with an adaptive perspective on cognition (e.g. Neisser, 1976; Saegert and Winkel, 1990). Although prior beliefs influence information processing, beliefs do change as the result of new, belief-inconsistent experiences if those experiences generate information so discrepant from the existing structures or so compelling that accomodation seems unevitable (Sherman et al., 1989). Crisis, bankrupcies or great opportunities represent compelling experiences for any manager and are likely to make the individual engage in information processing activities which could alter his environmental orientation. Thus, these results provide some support for theorists who have argued that a study of the experiental background of managers is neccessary in order to understand subsequent cognitive activities such as noticing

(Starbuck and Milliken, 1988), categorizing (Porac and Thomas, 1990) or interpretation (Isabella, 1990; Yasai-Ardekani, 1986) of environmental events.

A possible alternative explaination of these finding follow directly from the cognitive perspective on which much of this dissertation is built. Existing belief structures bias both recall and attribution of causes (Markus and Zajonc, 1985). Thus, an environmental orientation existing at the moment when the environmental shock occured could have produced the attributions of causes for the crisis, bankrupcy or opportunity. If this mechanism has been operating, a relationship between environmental shocks and environmental orientation does not imply that the belief structures are affected by the experience. Selective recall could also have produced this finding. The design used in this dissertation, however, does not permit the exploration of these competing explainations.

The relatively weak statistical significance of these findings warrant some discussion. Work experience with relevance to formation and change of environmental orientation was operationalized as the experience of environmental shocks. This particular operationalization obviously does not capture all experiences which could potentially influence on the formation and change of environmental orientation. Even managers who have not experienced bankrupcies, crises or great opportunities have experiences influencing beliefs concerning the relative importance of environmental segments. Differences in other forms of relevant experience is not captured in the research model. This underspecification of the model increases the error variance in the estimates and lowers the statistical conclusion validity of the test for relationships between experience of environmental shocks and environmental orientation. Further, the reliability of the experience indicators can be questioned. The measurements of experiences used in this dissertation relies on the memory for environmental shocks as well as their causes. Potentially, this measurement procedure is liable to memory effects, i.e. some managers could have forgotten environmental shocks and their attributed causes (e.g. Phillips, 1981). Reliability studies from event history research, however, indicate that people tend to have accurate memory for important events in their lives such as leaving home, marriage, job entry and exit (in Blossfeld et al., 1989). Although the experiences recalled here are different, it can be argued that they constitute important event for the managers involved.

With regard to the frequently stated assumption that the belonging to a particular department creates a local perspective and biased problem conceptualization (Dearborn and Simon, 1958; Walsh, 1988), this effect was not found for environmental orientation. As have been argued previously, departmental biases were not very prominent in Walsh's (1988) study, and could have been produced by an educational effect in the Dearborn and Simon (1958) study. It was also pointed out that a closer look at the latter study revealed inconsistent results (some of the patterns of attributions did not support the hypothesized causal mechanism). When considered together, these three studies cast considerable doubt on the departmental bias hypothesis. It appeares that managers are much less affected by their local departments' goals or information environments than previously assumed. When considering the relationship between environments and the organization's goal achievement, they seem to manage to detach themselves from their daily mindsets and take into account factors not directly related to their assigned tasks. In particular, this conclusion is supported by the lack of difference found between top manager and middle manager environmental orientation concentration. According to Walsh (1988) the Dearborn and Simon (1958) study was cited 60 times in the managements litterature in a recent ten-year period. Based on these results, it can be questioned whether this focus on deparmental affiliation as a predictor of managerial cognitions is warranted.

## 10.2 Strategy content and environmental orientation

Support has been found for the relationship between organizational strategy and environmental orientation. In particular, managers' supplier orientation and technology orientation were significantly related to strategy. The hypothesized causal mechanism producing these links was that the firm's chosen strategies determine the relative importance of environmental segments for the successful implementation of the strategies. Although the general hypothesis relating strategy to environmental orientation was supported, the hypotheses linking specific strategic emphases to specific environmental orientation were only moderately supported. The cost leader trait was positively related to

public sector orientation but no relationship with customer orientation was found. The generalizability of the relationship between public sector orientation and emphasis on cost leadership for competitiveness, however, might be limited by the fact that both industries used as setting for this study are heavily subsidized by government. In other industries, receiving less monetary support, there is no obvious reason why monitoring and building relations to public sector should be an effective part of the implementation of a cost leader strategy.

No support was found for the hypothesized link between domain defending and customer orientation. The logic behind this hypothesis was that firms operating within a narrowly defined product-market, over time were in a position to learn their customers preferences and buying behavior. Thus, their need to allocate attention to the customer sector was expected to be less than for managers of firms changing product-market more frequently. This negative finding, together with the finding that the customer sector was perceived to be the single most important environmental segment, appeares to be inconsistent with the causal mechanism relating customer orientation to customer uncertainty. A possible explanation which could reconcile the findings with theory is that the markets chosen by domain defenders generate a level of uncertainty comparable to the combined levels of firms operating in several product markets. This explanation, however, is rather unlikely given the possibilities of domain defenders to learn about customer issues over time. A more likely explanation is that the customer sector is important to the firm whatever their competitive weapons are. Recent research in industrial economics and strategy indicate that firms in a given industry form strategic groups where firms belonging to a strategic group follow similar strategies (Mascarenhas, 1989). Thus, domain defenders can be expected to compete with other domain defenders for customers. In both the ship building industry and the fishing industry, conservative firms sticking to a given product-market seldom operate alone in this market. Under such conditions, superior knowledge of customer preferences, demand fluctuations and buying behavior is an important contributor to competitive strength even when the firm pursues a domain defender strategy. The finding, together with the lack of negative relationship between cost leader strategy and customer orientation, is quite consistent with arguments from marketing theory which state that market orientation, in the sense of gathering, analyzing, disseminating and responding

to customer information is an important contributor to organizational performance no matter what the strategy of the firm is (Kohli and Jaworski, 1990; Narver and Slater, 1990).

Differentiators/prospectors were not found to be more customer oriented than managers in firms where this trait was less pronounced. This negative finding fits to the argument presented above, that customer orientation is an important part of the successful implementation of many strategies. This organizational trait, however, was found to be positively related to technology orientation of managers as hypothesized. Some support has been found for the idea that the more reliant the firm is on innovation, both in terms of products and markets, the more important monitoring and exploitation of technological change is.

No significant relationships between the analyzer trait and environmental orientation was found. This negative finding is not surprising given the weak relationships found between the purer strategic traits and environmental orientation. As the analyzer blends prospector and domain defender strategies (Miles and Snow, 1978), the resulting relationships between this strategy and environmental demands is also blended. Managers in analyzer firms should hold environmental orientations both reflecting the need for technology orientation following from the prospector part of the activities, along with public sector orientation of cost leaders if they operate under this strategy in the domain defending part of the business.

Support for the general hypothesis of relationships between strategy and environmental orientation indicate that strategy indeed has an impact on managerial cognitions as frequently has been assumed (Miles and Snow, 1978; Porter, 1980; Hambrick, 1981, 1982; Huff, 1982; Simons, 1991 and others). The results of this study, along with previous negative finding from attempts to relate the two (e.g. Hambrick, 1982) indicate that how managers' perception of environmental demands relate to strategy still is poorly understood.

Negative findings could, however, also be due to shortcomings in the design used in this

study. First, strategy was measured exclusively by perceptual measures provided by individual managers. No attempts was made in order to cross validate these measures using other measurement procedures. Thus, in reality, organizational strategy was measured by a key informant approach. The argument in favour of this measurement procedure was that the managers' perception of the firm's strategy, rather than some objective characterization of the firm's intended or realized strategy would impact on environmental orientation. The use of key informants for the provision of information on organizational characteristics could seriously reduce the reliability of the measurements (Phillips, 1981). In Chapter 8 of this dissertation it was also found that the correlations between strategy measures from managers from the same firms generally were quite low. Low reliability of strategy measures in this study could have produced differences between the organizations' position on the strategy scales (perceived strategy) and intended or realized strategies. Although perception of strategy is likely to influence beliefs about environmental demands, the firm's realized or intended strategy is often accompanied with implementation efforts which are likely to form managers' environmental orientation. According to the normative litterature on strategy implementation, strategy formulators should use a wide variety of structural, systems and process instruments in order to make people in the organization think and act in accordance with the chosen strategy (e.g. Galbraith and Kazanjian, 1978; Beer and Walton, 1987; Buller, 1988). Descriptive research on strategy implementation confirms that managers actively use incentives, information, persuation, cooptation or coercion in order to make planned changes in thinking and practices of organizational members (Nutt, 1986). If perceived strategy is different from the realized or intended strategy of the firms, the adaptation of implementation programs to the latter strategy could have influenced environmental orientation accordingly. Implementation efforts, however, normally includes efforts to communicate the chosen strategy. Thus it is highly unlikely that managers at the same time are influenced by implementation efforts and misperceive their firm's strategy. Managers included in this study also, in most cases are likely to be involved in the strategy development process. Participation in the process makes the misperception of strategy even more unlikely. A final possible interpretation of the relatively weak support for the hypotheses concerning strategy-environmental orientation relationships is that the sample of firms is too strategically homogenous to make the effects detectable. The

sample, however, includes firms from less than ten to several thousand employees, with product lines counting from less than ten to several hundred products. Some of the firms manufacture and market very mature products, while others are operating at the front of product and process technology. The firms in these industries, thus, probably are not more homogenous with regard to strategic differences than firms in many other industries used as settings for research on strategy.

### 10.3 Strategy process comprehensiveness and environmental orientation

Some support for the hypothesized relationship between strategy process comprehensiveness and envionmental orientation was found. It appears that in these two industries, technology orientation of managers is particularly related to the level of comprehensiveness of the strategy development process. The specific hypotheses stating that comprehensiveness would influence environmental orientation balance and moderate the influence of education were not supported in this study. In spite of strong theoretical arguments in favour of a relationship between strategy process comprehensiveness and environmental orientation, little support for these hypotheses was found in this study. Several interpretations of this negative finding are plausible. First, a possibility exists that none of the firms included in the sample has implemented a sufficiently comprehensive process to produce an effect on environmental orientation. This is, however, quite unlikely, as many of the managers reported high levels of activity on the elements of the strategy process in their firms.

Another possibility is that sufficient variation with regard to process development comprehensiveness does not exist in this sample of firms. Neither this explanation is very likely given the heterogenity with regard to size in the two samples.

A more substantial interpretation of the results seems more plausible. Some authors critisizing the use of formal strategy development processes have argued that it often degenerates to a symbolic exercise where participants fail to change cognitions or behaviors as a result of the process (e.g. Mintzberg, 1981; March, 1981). Even though a

major objective of strategy development processes is to generate top management team consensus on environmental threats and opportunities, firm strengths and weaknesses as well as plans for future resource allocations, product-market domains and actions, this according to skeptics, is not always accomplished. A possibility exists that managers are paying lip service to conclusions, priorities and plans for action generated by the process, but when they are back to their daily activities prior belief structures and behavioral patterns reappear. This pessimism with regard to the effects of formal strategic planning processes is also consistent with the inconclusive findings from reseach on the relationship between strategic planning and financial performance (e.g. Rue, 1973; Grinyer and Norburn, 1974; Sheenan, 1975; Bracker and Pearson, 1986; Robinson and Pearce, 1988). A final possibility is that the content of the strategy process, rather than its comprehensiveness must be explored in order to find effects on managerial cognitions. It could be that content parameters, such as degree of involvement and use of creative and analytical techniques - e.g. assumption surfacing, devil's advocacy, dialectic inquiery and brainstorming techniques have more impact on the cognitions of the top management team than process comprehensiveness per se.

## 10.4 Environmental uncertainty and environmental orientation

As expected, significant differences in environmental orientation between managers from the two industries were found. Some support was also found for the hypothesis that differential level of uncertainty affect the environmental orientation of managers. These results are consistent with the frequently made argument that managers must attent to, monitor, forecast or try to control environmental elements with high levels of unpredictable change (e.g. Thompson, 1967; Pfeffer and Salancik, 1978: Daft, Sormunen and Parks, 1988). In particular, managers in the fishing industry focus heavily on the supply sector due to the unpredictable and erratic character of availability of important fish species. Managers in the ship-building industry, when compared to the fishing industry experience higher level of technological turbulence. This difference is also reflected in greater attention devoted to technological issues.

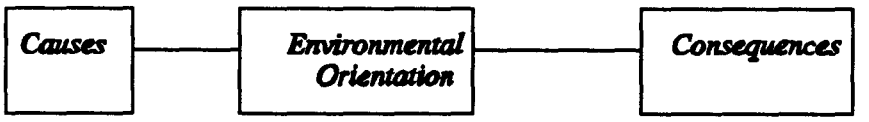
However, all hypothesized relationships between environmental uncertainty and environmental orientation were not supported. It was argued that managers in the shipbuilding industry experienced higher levels of customer uncertainty than managers in the fishing industry. Some support for this assumption was also provided by the results of the manipulation checks (Chapter 8). Nevertheless, customer orientation of managers in the fishing industry was not significantly higher than for managers in the ship building industry. This indicates that although the levels of uncertainty associated with technology and supplies seem to influence managerial environmental orientation, this is not the case for customer orientation. One possible explaination for this lack of empirical relationship between the two is that differences in customer uncertainty between the two industries are too small to produce the effect, and that uncertainty only affect orientation when the level exceeds a treshold. The results of the manipulation check does not, however, indicate that the absolute difference in uncertainty between the two industries is smaller for the customer sector than for the technology and supplier sector.

Obviously, uncertainty is not the only environmental trait affecting managerial orientation. Another environmental dimension frequently argued to affect managerial priorities and organizational action is the degree of dependence on environmental elements faced by the organization. According to the resource dependence perspective on organizational behaviour, organizations adapt to or try to control environmental elements on which they are dependent (Pfeffer and Salancik, 1978). The degree of depencence can differ from one environmental segment to the next. Following this perspective, although the level of customer uncertainty differs between the two industries, firms in both are highly dependent on customers and by consequence would focus intensively on this sector regardless of the level of uncertainty. This interpretation is also consistent with the results of my attempt to relate strategy to customer orientation. Although theoretical arguments in favour of different degrees of customer orientation across strategies were made, no such relationships were found. Taken together, these two negative findings support the arguments that customers constitute the most important environmental segment surronding business firms.

# CHAPTER 11

## LIMITATIONS AND DIRECTIONS FOR FURTHER RESEARCH

In this section I discuss some limitations of the research reported in this dissertation and point to some possible extensions which could improve the understanding of managers' environmental orientation, its causes and its consequences. Whereas the focus of this dissertation was to explore antecedents of environmental orientation as well as the construct itself, future research should also include an attempt to model conseqences of environmental orientation. This extended research perspective is illustrated in Figure 1 below.




**Figur 5. An extended Perspective on Environmental Orientation**

## 11.1 Limitations of the research perspective

As most research models used in order to do social science research, the perspective used in this dissertation is limited in the sense that variables having an influence on the subject matter (environmental orientation) are not included. This is the case for the representation of managerial background as well as organizational and environmental characteristics. Important aspects of the environmental orientation formation and change processes, thus, remain unexplored. Further, the conceptualization and operationalization of the environmental orientation construct itself is limited, and can be extended in several directions. Although the conceptualization used in this dissertation represents an extension when compared to the market orientation construct (Kohli and Jaworski, 1990), it is obvious that many environmental segments potentially important to managers have not been considered in this research. Organizational environments were represented by five sectors (customers, competitors, publics, technology and suppliers). Althouh it can be argued that these sectors are of particular importance to most business organizations, they obviously do not encompass all environmental elements of importance to organizations. The research perspective has been limited in the sense that what often is termed macro-environments (e.g. Duncan, 1972) has not been included neither in conceptualization nor in measurement of managers' environmental orientation. Macro-environments includes, among others socio-cultural, political and macroeconomic developments of importance to many firms. In order to provide a more complete understanding of how managers perceive their organizations' environments future research could include macro-environments in the conceptualization and operationalization of the environmental orientation construct.

### 11.1.1 Managerial background

Starting out with a discussion of managerial background variables it would be desirable that individual work experience with relevance to formation of environmental orientation should be more thoroughly conceptualized and operationalized in future research. In particular, the influence of work experience from other industries on environmental orientation was only superficially explored in this dissertation. A more in depth study of

relationships between characteristics of industries in which managers previously have worked, such as competitive intensity, technological turbulence and degree of regulatory interference with company conduct, could provide more insight concerning the dynamics of environmental orientation formation and change. Further, the effect of the time lags between experiences and environmental orientation should be included in future research. Although the effect of education was found to be enduring in this research, we still know little about whether the effect of work experiences decay rapidly and are substituted by new experiences on an ongoing basis - or if they stick to the individual manager and become a permanent part of his environmental orientation.

### 11.1.2 Organizational characteristics

As dicussed above, it can be questioned whether the perceived organizational variables used in this research reflect objective organizational traits. This topic will be discussed more in depth below. Here I focus on limitations in the representation of the organization used in this study. Strategy development and strategy process comprehensiveness were used in this study, because these two variables seemed to be closely related to managers' perceptions of the organizational environments. One important aspect of strategy is the alignment of the organization to its environment; one important part of a strategy process is analysis of environments. Other organizational characteristics can, however, also have impacts on environmental orientations of managers. In particular, it has been argued that the degree of formalization in organizations, i.e. the use of rules and procedures, explicit goal structures, strategic issue agendas and so on influence the cognitive activities of organizational members (e.g. Hedberg, 1981; Dutton and Duncan, 1988). High degrees of formalization could bring managers cognitions more in line with the demands following from the organization's strategy, and thus strengthen the relationship between organizational strategy and environmental orientation of managers.

Further, research on individuals' cognitive responses to threats indicate that threats have some predictable impacts on information processing (e.g. Janice, 1982; Staw, Dutton and Sunderland, 1981). Exposure to threats make individuals process less issue-relevant

information, consider fewer alternative solutions to problems and choose prematurely courses of action in response to the problem they face. Organizational members are quite frequently exposed to threats stemming from poor financial performance. In future research, the impact of low financial performance on concentration of environmental orientation should be explored.

### 11.1.3 Environments of Organizations

This research focused on environmental **uncertainty** as a predictor of environmental orientation of managers. Uncertainty has frequently been identified as an important environmental trait creating problems for managers as well as attracting their attention (e.g. Thompson, 1967; Pfeffer and Salancik, 1978). The importance of uncertainty as a factor influencing environmental orientation has also been supported by the findings reported in this dissertation. Uncertainty, however, is probably not the only environmental trait having an impact on environmental orientation of managers. Other environmental dimensions such as concentration, hetereogenity, growth, interconnectedness and munificence have previously been argued to influence organizational strategies and structures, as well as the problems facing managers.

In particular, research in industrial economics indicate that conduct of firms depend on structural conditions in the industries to which they belong - such as barriers to entry, concentration and degree of product differentiation (Scherer, 1980). As choice of conduct has been assumed to depend on managers' perception of their environments (Miles et al. 1974), a likely hypothesis would be that environmental orientation also depend on structural characteristics of the industry. It is particularly likely that competitor focus would depend on barriers to entry, product differentiation and concentration. Future research should assess the impact of these and other dimensions on environmental orientation.

## 11.2 Limitations in research design

This study compared environmental orientations of managers in two industries. This design provides relatively little information on the relationship between environmental orientation and environmental uncertainty, as only two levels of environmental uncertainty was included. Because of this limitation, it is not possible to say whether there is a monotone relationship between environmental orientaton and uncertainty, or whether the level of uncertainty must exceed a given threshold before it has an impact on managers' orientation. Some of the research on belief change cited above, indicate that the divergence between environmental characteristics, such as uncertainty, and mental representations of the environments must be relatively strong before belief change occurs (e.g. Festinger, 1957). According to this, it could be expected that only relatively large differences in environmental uncertainty would produce differences in environmental orientation between managers from different industries. Future research could explore this hypothesis by using samples from several industries differing with regard to environmental uncertainty in one or more environmental segments.

Further, the operationalization of environmental uncertainty did not permit an exploration of intra-industrial differences in environmental uncertainty. As argued in chapter 3, organizations have at their disposal a large repertoir of mechanisms which could be used in order to reduce environmental uncertainty (such as interlocking directorates, market segmentation and targeting, advertizing, lobbying and so on). If some organizations make more extensive use of such uncertainty-reducing mechanisms than others, it is questionable to what degree firms in one industry face similar levels of environmental uncertainty. In order to explore the impact of intra-industrial differences in environmental uncertainty, future research could use managers' perceptions of environmental uncertainty as predictor of environmental orientation.

In order to assess the impact of strategy on environmental orientation, managers' perceptions of their firms' strategies were used as predictors. The attempt to validate this construct indicated that the measures only to a small extent capture objective organizational characteristics. Future research could use other measurement procedres such

as external assessment or objective indicators.

The design used in this study was a cross sectional survey. Inherently this design is weak with regard to internal validity of the findings. In particular, this design often create problems with deciding on direction of causality when association between two variables has been found. Association caused by influence of third variables on independent and dependent variables simultaneously is also difficult to rule out in a convincing manner. Future research should validate the findings reported here using experimental or quasi-experimental designs.

### 11.3 Extensions: Consequences of Environmental Orientation

This study has focused on causes of environmental orientation as well as the meaning of the construct itself. Partly, the rationale for studying environmental orientations of managers stems from a widely held belief that managerial orientations have impacts on what managers notice, their decisions and actions (e.g. Miles, Snow and Pfeffer, 1974; Weick, 1979; Kiesler and Sproull, 1982 and many others). Further research should explore these topics and include **outcomes** of environmental orientations in terms of its effect on how managers conceptualize and solve organizational problems, how they react or fail to react to environmental change. The ultimate goal of research on environmental orientation should be to identify patterns of environmental orientation associated with organizational success. One way of exploring this topic would be to investigate the effects of match between environmental requirements and environmental orientation. In the behavioral model developed in this dissertation, it was argued that managers would focus on environmental segments with high levels of uncertainty. A possible extention of this reasoning would be that managers **should** focus on uncertain environments because those environments create opportunities and threats to the firm. Another extension would be to explore the question of whether managers focusing on one or a few segments contribute more to their organizations' success than managers trying to take everything into account by considering many environments equally important and distributing their attention equally across several segments.

Finally, most managers of modern organizations are parts of top management teams. This implies that important decisions often are outcomes of group processes in which several individuals take part. Many researchers have been concerned with whether these teams should be hetereogeneous or homogeneous with regard to their backgrounds and cognitions (e.g. Hambrick and Mason, 1984). Thus, an interesting perspective for future research would be to explore the impacts of environmental orientation homogenity-hetereogenity of top management teams on decision-making behavior and organizational performance.

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# APPENDIX 1: COVER LETTER

Rune Lines,
Institute of Marketing
Norwegian School of Economics and Business Administration
Breiviken 2,
5035 Bergen-Sandviken

Respondent's name and adress

Bergen, / , 1991-2

Dear nn

I am grateful that you agreed to participate in this study. The data will be used for the completion of a doctoral dissertation in strategy at NHH. The questionnaire has been pretested and its completion will take approximately 30 minutes.

Sincerely

Rune Lines

# APPENDIX 2: QUESTIONNAIRE

## MANAGERS' PRIORITIES AMONG ENVIRONMENTAL DEMANDS

All information will be considered **confidential**. This implies that nobody will get access to information which can be traced back to individuals or individual firms.

Company name:_____

Your name:_____

Please return to: Rune Lines,
Institute of Marketing,
Norwegian School of Economics and Business Administration,
Breiviken 2,
5035 Bergen-Sandviken

## ENVIRONMENTAL ORIENTATION

A. Assume that you hire a person who is to work with the organizational environments (collection of environmental information, analysis, influencing environmental actors ets.). Please allocate his working hours (= 100%) to the following sectors (if you would give all sectors equal priority, please indicate 20% pr sector).

1. Technology and technological developments:_____%

2. Customers and customer matters (both end-users and distributors):_____%

3. Competitors and competitor-related matters:_____%

4. The decisions, allocations, actions, industrial policies etc of public sector:_____%

5. Access to raw material and other important inputs - in general, matters concerning your suppliers and supplies to your firm:_____%

Total: 100%

B. During one normal week of work, how many hours do you spend communicating with the following external actors (by telephone, face-to-face, by letter, by fax and so forth):

Please **circle** around the number of hours.

1. Buyers of tour firm's products

0 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20

2. Suppliers of raw materials and other inputs

0 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20

3. Public authorities (Norwegian institutions cited as examples)

0 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20

4. Competitors

0 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20

5. Organizations and individuals supplying or developing product or process technology which could be adopted by the firm.

0 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20

C. Below you will find some statements. For each statment, please indicate your degree of agreement/disagreement by a circle.

1. Monitoring the technological development is vital for my firm's performance.

**Totally disagree** **Totally agree**

**-5 -4 -3 -2 -1 0 1 2 3 4 5**

2. In this industry survival is dependent on using considerable resources on monitoring competitors' plans and moves.

**Totally disagree** **Totally agree**

**-5 -4 -3 -2 -1 0 1 2 3 4 5**

3. Thorough knowledge of customer needs and wants is an important source of success for my firm.

**Totally disagree** **Totally agree**

**-5 -4 -3 -2 -1 0 1 2 3 4 5**

4. In order to make the right decisions in this industry, one must continuously monitor the public sector.

**Totally disagree** **Totally agree**

**-5 -4 -3 -2 -1 0 1 2 3 4 5**

5. Scanning the supplier sector should be one of the most important tasks of managers in this industry.

**Totally disagree** **Totally agree**

**-5 -4 -3 -2 -1 0 1 2 3 4 5**

6. I always consider the technological developments when making important decisions.

**Totally disagree** **Totally agree**

**-5 -4 -3 -2 -1 0 1 2 3 4 5**

7. I always allocate considerable time and resources to monitoring the plans and actions of the public sector.

**Totally disagree** **Totally agree**

**-5 -4 -3 -2 -1 0 1 2 3 4 5**

8. If we had more resources I would have increased our activities related to market intelligence and market analysis.

**Totally disagree** **Totally agree**

**-5 -4 -3 -2 -1 0 1 2 3 4 5**

9. If a manager is to be successful in this industry, s/he has to use considerable amounts of time and energy for developing good relations with the firm's suppliers.

**Totally disagree** **Totally agree**

**-5 -4 -3 -2 -1 0 1 2 3 4 5**

10. I always consider the future competitive situation when making important decisions.

**Totally disagree** **Totally agree**

**-5 -4 -3 -2 -1 0 1 2 3 4 5**

11. The most important environmental events are the public sector's decisions and actions.

**Totally disagree** **Totally agree**

**-5 -4 -3 -2 -1 0 1 2 3 4 5**

12. The most important environmental events are the competitors' plans and moves.

**Totally disagree** **Totally agree**

**-5 -4 -3 -2 -1 0 1 2 3 4 5**

13. The most important environmental events are supplier-related matters.

**Totally disagree** **Totally agree**

**-5 -4 -3 -2 -1 0 1 2 3 4 5**

14. The most important environmental events are tehcnological changes and developments.

**Totally disagree** **Totally agree**

**-5 -4 -3 -2 -1 0 1 2 3 4 5**

15. The most important environmental events are changes and developments in customers' needs and wants.

**Totally disagree** **Totally agree**

**-5 -4 -3 -2 -1 0 1 2 3 4 5**

D. Based on your total processing of information concerning the firm's environments, please state which percentage is related to the following sectors
(total = 100%):

1. Customers and customer matters:_____

2. Suppliers and supplier matters:_____

3. Competitors and competitor matters:_____

4. Technology and technological developments:_____

5. Matters related to public sector:_____

## BUSINESS STRATEGY

It is common to differentiate between firms based on their basic approach to the achievement of competitive advantage. Some firms compete by having lower costs than their competitors. Other firms compete by differentiating their products and thereby are perceived as different from/better than competitors. Another group base their competitiveness on being first movers with regard to development and marketing of new products. The most common is, however, perhaps that firms lack a clear competitive strategy and are pursuing more than one strategy simultaneously. If you work in such a firm, you probably do not feel that your firm belongs to any of these categories.

Please state to what degree you agree with the following statements by indicating with a circle the alternative which best describes your firm.

1. Our competitiveness stems from our efforts to achieve lower costs than our competitors.

**Totally disagree** **Totally agree**

**-5 -4 -3 -2 -1 0 1 2 3 4 5**

2. Our competitiveness is a result of our efforts to design and manufacture products which are unique in this market.

**Totally disagree** **Totally agree**

**-5 -4 -3 -2 -1 0 1 2 3 4 5**

3. We are competitive because we move early into new products so that margins are high in periods before the market becomes crowded with new entrants.

**Totally disagree** **Totally agree**

**-5 -4 -3 -2 -1 0 1 2 3 4 5**

4. We are moving quickly into new business areas, but only after the pioneers have found out whether the areas are profitable or not.

**Totally disagree** **Totally agree**

**-5 -4 -3 -2 -1 0 1 2 3 4 5**

5. We have defined our business areas carefully, and we seldom consider new areas even if these might seem promising.

**Totally disagree** **Totally agree**

**-5 -4 -3 -2 -1 0 1 2 3 4 5**

6. We have a basic business area. Within this area, competitiveness has top priority. Parallell, we monitor and consider new business areas, and enter areas which seem promising.

**Totally disagree** **Totally agree**

**-5 -4 -3 -2 -1 0 1 2 3 4 5**

7. We are implementing more cost reduction programs than the average firm in this industry.

**Totally disagree** **Totally agree**

**-5 -4 -3 -2 -1 0 1 2 3 4 5**

8. Our products are better adapted to customers' needs and wants than the average firm in this industry.

**Totally disagree** **Totally agree**

**-5 -4 -3 -2 -1 0 1 2 3 4 5**

9. We are among the firms in this iondustry which are first out with new products and product improvements.

**Totally disagree** **Totally agree**

**-5 -4 -3 -2 -1 0 1 2 3 4 5**

10. Most firms in this industry enter new business areas more often than us.

**Totally disagree** **Totally agree**

**-5 -4 -3 -2 -1 0 1 2 3 4 5**

## STRATEGY PROCESS COMPREHENSIVENESS

In this section I wish to measure to what degree your firm has implemented a formalized strategy development process. I would like to underscore that little evidence for a strong relationship between planning sophistication and firm performance exists.

Please indicate to what degree you think the following statements describe the situation in your firm:

1. We have short-term plans for how to improve our competitiveness.

**Totally disagree** **Totally agree**

**-5 -4 -3 -2 -1 0 1 2 3 4 5**

2. We have plans for which markets to enter in the coming years.

**Totally disagree** **Totally agree**

**-5 -4 -3 -2 -1 0 1 2 3 4 5**

3. A person or a group of persons in the firm has special responsibility for the strategy development.

**Totally disagree** **Totally agree**

**-5 -4 -3 -2 -1 0 1 2 3 4 5**

4. Top management has created a climate supportive of the strategy development (it is easy to discuss openly how we compete, which markets to enter, new business areas etc.)

**Totally disagree** **Totally agree**

**-5 -4 -3 -2 -1 0 1 2 3 4 5**

5. Top management has developed a formal statement about in which business areas we want to participate.

**Totally disagree** **Totally agree**

**-5 -4 -3 -2 -1 0 1 2 3 4 5**

6. Incentives are related to the achievement of strategic goals.

**Totally disagree** **Totally agree**

**-5 -4 -3 -2 -1 0 1 2 3 4 5**

7. We have clear objectives for the coming years.

**Totally disagree** **Totally agree**

**-5 -4 -3 -2 -1 0 1 2 3 4 5**

8. We have a clear idea about our strengths and weaknesses.

**Totally disagree** **Totally agree**

**-5 -4 -3 -2 -1 0 1 2 3 4 5**

9. We continuously monitor the environments for threaths to our competitiveness.

**Totally disagree** **Totally agree**

**-5 -4 -3 -2 -1 0 1 2 3 4 5**

10. We continuously monitor the environments for opportunities for improving our competitiveness.

**Totally disagree** **Totally agree**

**-5 -4 -3 -2 -1 0 1 2 3 4 5**

## BACKGROUND INFORMATION ABOUT YOURSELF

In this section of the questionnaire, I want you to give some information on your own background. In particular, I'm interested in your work experience and your formal education.

### A. Education

1. What is your highest degree:_____

2. What was your speciality:_____

3. When were you graduated:_____

4. What is your age:_____

### B. Work experience

1. Please state which positions you have previously held (lasting more than one year) during your professional carrier:_____
_____
_____
_____
_____

2. What is your present position:_____

3. In which other industries have you worked (please indicate the position held, as well as in which period):_____
_____
_____
_____

5. Have you ever experienced financial crises in any of the firms in which you have worked? Yes:_____ No:_____

6. If you answered yes to question 5, please indicate the main reason(s) for this/these crisi(e)s by ticking after the following alternatives:

Technological matters:___
Demand-related matters:___
Competition:___
Public sector's decisions or actions:___
Supply of input:___
Internal matters:___

7. Have you ever experienced bakruptcies in any of the firms in which you have worked?
Yes:___ No:___

8. If you answered yes to question 5, please indicate the main reason(s) for this/these bankpruptcies by ticking after the following alternatives:

Technological matters:___
Demand-related matters:___
Competition:___
Public sector's decisions or actions:___
Supply of input:___
Internal matters:___

9. Have you ever experienced that internal or environmental changes have created significant new opportunities for your firm(s)? Yes:___ No:___

10. If you answered yes to question 9, please indicate the main reason(s) for this/these opportunities by ticking after the following alternatives:

Technological matters:___
Demand-related matters:___
Competition:___
Public sector's decisions or actions:___
Supply of input:___
Internal matters:___