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Taxonomic Mental Models
in Competitor Definition

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Taxonomic Mental Models in
Competitor Definition

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Taxonomic Mental Models in
Competitor Definition

ABSTRACT

In this paper, we outline a cognitive approach to the problem of competitor definition. The paper begins with a discussion of the information processing demands implied by current models of competitive strategy. We then discuss how decision-makers simplify the competitive environment by using a mental model of competitive groups. The paper ends with a discussion of the implications of a cognitive approach for the classification of organizations and organizational adaptation.

Although competition among organizations has historically been considered an important determinant of organizational performance (e.g., Scherer, 1980), the topic has received renewed attention with the development of ecological approaches to organization-environment relations (e.g., Aldrich, 1979; Hannan & Freeman, 1977), substantive models of competitive strategy (e.g., Porter, 1980), and pragmatic concerns about industrial competitiveness in a global economy (e.g., Teece, 1987). Theoretical treatments of rivalry have typically taken an environmental perspective by viewing competitive interdependencies as external pressures on the actions and outcomes of individual organizations. However, most theorists have recognized that organizations can and do exercise some degree of strategic choice in adapting to competitive pressures. This is true, for example, of game theory (e.g., Shubik, 1959) resource dependency theory (e.g., Pfeffer & Salancik, 1978), and contingency theory (e.g., Khandwalla, 1981). Business strategy scholars have perhaps been most explicit in this regard by arguing that an important role is played in competitive dynamics by key decision-makers who monitor rival organizations and formulate strategies to achieve competitive success (e.g., Porter, 1980; Rumelt, 1987).

To the extent that decision-makers have a role in an organization's responses to rivalry, it becomes necessary to inquire about the social psychological factors influencing how

decision-makers frame competitive environments and understand the nature of competitive threats. This follows from recent cognitive approaches to the study of organization-environment relations (e.g., Daft & Weick, 1984; Dutton & Jackson, 1987; Kiesler & Sproull, 1982; Smircich & Stubbart, 1985). Daft and Weick (1984), for example, have argued that strategic decisions are driven by cognitive structures that label and make sense of environmental occurrences. From a cognitive perspective, decision-makers act upon a mental model of the environment. Thus, any explanation for strategic responses to competitive pressures must ultimately consider the mental models of competitive strategists. Unfortunately, the tendency to view competition as an environmental phenomenon involving primarily economic contingencies has resulted in the psychology of the competitive strategist either being completely ignored or assumed away by the axioms of existing theory. Consequently, as Weitz (1985) has noted, very little is known about the socio-cognitive underside of competitive interactions, and virtually no theory exists to explain how strategists make sense of competitive environments.

We attack this deficiency in the present paper by setting out a framework to resolve perhaps the most fundamental problem in competitive sensemaking: competitor definition. Porter (1980) has argued that a viable competitive strategy is dependent upon decision-makers understanding the goals, strategies, capabilities, and assumptions of rivals. However, before this

understanding is possible, and thus before competitive strategies can be formulated, decision-makers must have an image of who their rivals are and on what dimensions they compete. Given the diverse range of organizational forms, and the fact that decision-makers possess only a limited capacity to process complex flows of interorganizational cues, the task of defining "the competition" is non-trivial and problematic. In this paper, we will first outline the cognitive dilemma faced by decision-makers when formulating competitive strategies, and then propose that this dilemma leads to the use of simplifying mental models to define rivals. To the extent that the two can be separated conceptually, our focus is primarily upon the structure of these mental models rather than upon the process of competitive identification per se. The paper draws heavily from recent research in cognitive science, and ends with a discussion of the implications of our approach for such topics as organizational classification, organizational adaptation, and cognitive assessment.

INTERORGANIZATIONAL COMPARISONS AND COMPETITOR DEFINITION

According to current ecological models, organizations compete with one another to the extent that they are similar in form and require similar resources to survive (e.g., Aldrich, 1979; Hannan & Freeman, 1977). Organizational form has been defined as the configuration of attributes determining an organization's resource demands (McKelvey, 1982). Two

organizations are similar if they share important attributes and hence tap the same resource flows within the task environment. Since critical resources are usually scarce, similar organizations are often competitively interdependent in that the resource acquisitions of one organization detract from the resource acquisitions of the others. Competitive interdependence implies that an organization's survival is a function of its resource capabilities relative to existing rivals. In Aldrich's (1979) terms, "Selection occurs through relative rather than absolute superiority in acquiring resources, and an effective organization is one that has achieved a relatively better position in an environment it shares with others, rather than the hypothetical 'best' position" (p. 30).

Thus, to the extent that strategic choice is involved in competitive interactions, the goal of competitive strategy is to manipulate organizational attributes (e.g., inputs, outputs, size, administrative structure, technologies, skills, etc.) in such a way as to achieve a superior position relative to rival organizations--in Porter's (1980) terms, to maximize the value of capabilities distinguishing the organization from its competitors (p. 47). In solving this problem, strategists must inevitably consider the attributes of other organizations. On the one hand, strong pressures exist to imitate organizational forms that have been successful in exploiting a resource niche (e.g., Aldrich, McKelvey & Ulrich, 1984; DiMaggio & Powell, 1983; Hannan & Freeman, 1977). On the other hand, superiority in the

acquisition of resources comes from creating and sustaining attributes that are not easily imitated (e.g., Porter, 1980; Rumelt, 1984). The dual pressure to both imitate and differentiate means that one important interpretive responsibility of the strategist is to scan the environment, assess an organization's attribute similarity vis-a-vis others, and formulate plans to create that specific attribute configuration which balances similarities and differences in a profitable way (Aldrich et al., 1984).

Here lies the interpretive problem of competitor definition. A complete assessment of an organization's strengths and weaknesses would entail comparing all the attributes of the focal organization with all known attributes of all other organizations. Given imperfections in the flow of information about other organizations (even elaborate competitor intelligence systems have their flaws), as well as cognitive limitations on the part of the strategist, a complete assessment is impossible. The strategist is thus faced with a definitional problem. Should all, some, or no other organizations be considered competitive reference points? How is a balance achieved between maximizing the use of all information about an organization's competitive strengths and weaknesses, and simplifying environmental scanning and competitive monitoring?

Historically, this problem has been dealt with by economists who have specified a priori criteria for classifying organizations into competitive groups. Two different criteria

have received the most attention (e.g., Scherer, 1980). According to the "industry" criterion, organizations compete with one another when they share similar technological attributes and can produce similar outputs. Thus, for example, two organizations capable of manufacturing steel might be defined as members of the "steel industry" and be considered competitors because of the overlapping technological attributes their steel production would necessitate. Alternatively, the "market" criterion suggests that organizations compete with one another when their output attributes fulfill similar client functions and are thus substitutable. Thus, for example, an organization manufacturing plastic auto components might be considered in the same competitive group (e.g., the "auto components market") as an organization producing metal parts because both types of outputs satisfy a demand for automotive products.

Defining competitors in this fashion simplifies the interorganizational comparison process considerably. However, such derived classifications are unsatisfactory as cognitive accounts for how decision-makers solve the comparison dilemma in practice for a number of reasons. First, there is no reason to assume that managers use the same criteria as researchers when ascertaining competitors. Walton (1986), for example, found that one attribute mentioned by managers as discriminating among organizational forms was size, a characteristic not easily assimilated into either industry or market segmentations. Second, both industry and market criteria are themselves somewhat

ambiguous. Nightengale (1978), for example, has argued that industry classifications often lead to somewhat arbitrary groupings, and Robinson (1956) once argued that "A precise and meaningful definition of an industry is a vain objective" (p. 361). Similar arguments against the economic market criterion have also been put forth (e.g., Day, Shocker, & Srivastava, 1979). Finally, and most importantly, both criteria beg the question of limiting interorganizational comparisons since information about technological similarities and product substitutabilities is often incomplete (Day et al., 1979). Because of imperfect information, industry and market segmentations are as much inference as fact, and neither criterion truly explains how decision-makers construct such segmentations to define competitors and engage in competitive scanning.

The logic of classifying organizations into competitive groups is not, however, necessarily wrong. Indeed, as McGee and Thomas (1986) point out, rigorous classifications can help to uncover important behavioral differences among clusters of organizations. However, a search for the cognitive underpinnings of competitive strategy must deal not with the groupings of industrial researchers, but with the cognitive models constructed by decision-makers to make sense of the competitive environment. We suggest that such models consist of internalized "cognitive taxonomies" of organizational forms which describe organizational similarities and differences. By using such taxonomies,

decision-makers define the form of their own organizations via comparisons with known organizational types. On the basis of these comparisons, competitive definitions are constructed and used during the the process of strategy formulation. In a sense, then, we are suggesting that decision-makers act as "organizational taxonomists" attempting to define competitors by sorting through the complexities of organizational forms in the environment. How cognitive taxonomies of organizational forms are used to understand the competitive environment is the topic of the next section.

USING COGNITIVE TAXONOMIES TO MAKE SENSE OF ORGANIZATIONAL DIVERSITY AND DEFINE THE COMPETITION

Some General Principles of Cognitive Categorization

Two issues are important when considering the cognitive classification of organizational forms. First, one must describe how decision-makers group individual organizations into more abstract cognitive categories. If "cognitive category" is defined as a collection of organizations that are perceived as similar to each other and different from those outside the category, this issue reduces to understanding the rules transposing similarity judgments into abstract organizational groups. Second, one must describe how such categories, once formed, are related to one another within some overall cognitive structure. Because they are fundamental to categorization in any knowledge domain, these two questions have motivated considerable

psychological research. A general consensus about the way people categorize aspects of the environment has emerged, and it is useful to review the important findings before discussing how managerial mental categories influence competitive identification. Dutton and Jackson (1987) have similarly reviewed categorization research in their work on the perception of organizational threats and opportunities.

With respect to how categories are formed, theory and research suggests that cognitive categories are developed from perceived similarities and differences in the attributes of the objects or events being classified (e.g., Rosch, 1978; Smith & Medin, 1981; Holland, Holyoak, Nisbett, & Thagard, 1986). Using "retailing" firms as an example, a manager might form the named category "discount clothing stores" by recognizing that certain individual establishments have a number of attributes in common such as "low overhead locations," "reduced sales staff," "limited selection," "second-season designer clothes," and "low prices." Some attributes (e.g., "second season designer clothes") might be common only to "discount clothing stores." These attributes have high informational value because they serve to distinguish a "discounter" from other types of clothing retailers. Other attributes (e.g., "low prices," "reduced sales staff") might be present in other types of retailers, making such attributes less informative as a basis for classifying businesses. This means that a cognitive category such as "discount clothing stores" will develop when there are sufficient attributes to distinguish such

organizations from other organizational forms known to exist.

Thus, cognitive categories can be considered "feature sets" of attributes which are perceived to be common to category members. One important finding which has emerged from psychological research is that cognitive categories are "polythetic" and seem to possess graded or indefinite boundaries (e.g., Rosch & Mervis, 1975). This means that no single attribute is viewed as belonging to all members of a category, and no member is perceived to possess all attributes. Instead, members are perceived to vary in how typical they are of the category. Rosch and Mervis (1975) found evidence suggesting that the members of cognitive categories considered very typical are those members sharing many attributes with other category members. Rosch and Mervis labeled typical members "prototypes," and suggested that they represent the perceived central tendency of the category. Thus, for example, an establishment selling hamburgers would probably be considered less typical of the category "restaurant" than an elegant establishment offering French haute cuisine because the latter organization possesses more attributes common to other types of "restaurants."

With respect to the relationship between cognitive categories, evidence suggests that categories, once developed, often form a hierarchical "cognitive taxonomy." According to Rosch (1978), a cognitive taxonomy is

. . . a system by which categories are related to one another by means of class inclusion. The greater

the inclusiveness of a category within a taxonomy, the higher the level of abstraction. Each category within a taxonomy is entirely included within one other category (unless it is the highest level of the category) but is not exhaustive of that more inclusive category (p. 30).

In a cognitive taxonomy, the most specific (or terminal) level consists of the objects, events, etc. being classified. These are grouped into more abstract categories, which themselves form categories of even greater abstraction until a "root node" is established at the most general level of classification. The logic of hierarchical cognitive structures has been discussed by many cognitive theorists (e.g., Anderson, 1983; Collins & Quillian, 1969; Rosch, 1978; Holland et. al., 1986) who have argued that such structures simplify the storage of information about complex environments. Instead of storing all the attributes defining each category at every level of abstraction, specific categories can "inherit" the attributes of more general categories and thus need include only those attributes which distinguish them from other subcategories. Thus, for example, knowing that an organization is a "restaurant" already implies certain attributes common to most restaurants (e.g., "sells food," etc.). The subcategory "fast food restaurants" need include only those attributes which make this type of restaurant different from other known types.

The existence of cognitive taxonomies has been confirmed in

both psychological and anthropological research. For example, Kempton (1978) found that people organize their knowledge of common utensils with a taxonomic structure of five hierarchical levels. The category "utensils" was named as the most general category, while specific categories such as "Chinese teacups" were least inclusive. Adelson (1985) uncovered a three-level cognitive taxonomy in assessing the conceptual knowledge of computer programmers regarding "data structures" and "algorithms" (see Figure 1). Berlin, Breedlove, and Raven (1974) found a three-level taxonomy in the Tzeltal language for "oaks." The prevalence of hierarchical cognitive structures has prompted some researchers to claim that they are fundamental to human thinking and understanding (e.g., Anderson, 1983; Schank, 1982).

Cognitive Taxonomies of Organizational Forms and the Links to Competitor Definition

The cognitive theory described above provides a useful framework for thinking about how decision-makers make sense of organizational diversity and define competitors. By internalizing a mental classification of organizational forms, the strategist can simplify the interorganizational environment by collapsing individual organizations into category types. Interorganizational comparisons can thus be performed not on the attributes of individual organizations, but on the typical attributes of categories of organizational forms. In this way, competitive scanning and boundary definition can occur at a more abstract level, thereby reducing the complexity of the comparison

problem. We offer five propositions to clarify how this simplification process is worked out in practice, and also discuss certain important qualifications to a strictly hierarchical view of competitor definition.

Proposition I: Decision-makers make sense of competitive environments by developing cognitive taxonomies summarizing the similarities and differences among organizations.

This is our most basic assertion, and follows directly from the cognitive theory and research discussed above. In the course of their transactions with the environment, decision-makers encounter many organizations of varying characteristics. Although all organizations are in some sense unique, Proposition I suggests that strategists group organizations into a conceptual scheme consisting of categories varying in abstractness. The category formation process can occur via both "bottom-up" and "top-down" inferences. With the former, organizational categories are constructed from direct experience with actual organizations. Alternatively, top-down category formation results from the use of category labels available from such sources as the business press, government documents, and general cultural belief systems. In this case, mental categories are formed in the absence of direct experience with organizations included within the category boundary.

Direct evidence for Proposition I has been obtained in

recent studies by Walton (1986), Reger (1987), Hodgkinson and Johnson (1987), and Porac, Thomas, and Baden-Fuller (1989). Both Walton (1986) and Reger (1987) used the Repertory Grid technique (Kelley, 1955) in having bank executives judge the similarities and differences among various financial organizations. Respondents tended to make their comparisons on the basis of such attributes as location, geographic scope, target market, organizational structure and size, growth strategies, and management skills. Both studies found evidence that bank executives distinguished between "downtown" and "suburban" bank organizational forms.

Hodgkinson and Johnson (1987) and Porac et al. (1989) explicitly asked managers of firms in the United Kingdom to list categories and subcategories of organizations relevant to their own businesses. In the former study, managers of organizations in the "grocery" business articulated very rich taxonomic cognitive structures. In the case of the owner of a chain of food stores, for example, these researchers elicited a four-level cognitive structure starting at the general category "national grocery industry" and progressing to specific types of "specialist" grocers such as "provisions," "greengrocer," and "meats." Similarly, Porac et al. (1989) elicited taxonomies from managers of Scottish knitwear firms. One respondent (see Figure 2), for example, produced a six-level taxonomy that consisted of the general category "textiles" and progressed through such categories as "knitwear," "fashion knitwear," and "fully-

fashioned knitwear," and ended with categories concerning the specific fiber types (e.g., cashmere, wool, cotton, etc.) that different firms emphasize in their "fully-fashioned" lines.

Two aspects of the above cognitive taxonomies should be mentioned. First, greater taxonomic complexity will probably exist in classifying those organizations most familiar to the decision-maker. This is line with the suggestion of Dougherty (1978) and Rosch, Mervis, Gray, Johnson, and Boyes-Braem (1976) that expertise in an environmental domain produces finer discriminations among elements. Thus, strategists will have more elaborate cognitive taxonomies concerning those organizations most often encountered in transactions with the environment. Such complexity should be evident by more taxonomic levels, more categories at any given level, and a richer base of category attributes. For example, Hodgkinson and Johnson (1987) observed that managers who came into daily contact with a wide range of food retailers had a much more complex understanding of the similarities and differences among grocery organizations than managers who were isolated from frequent contact with the market.

Second, there is likely to be some question as to whether all managerial representations of organizational forms are hierarchically organized (Hodgkinson & Johnson, 1987). Evidence and theory in this regard are inconclusive. There seems to be little disagreement in the relevant literatures that a fundamental property of the human mind is its ability to inductively generate cognitive categories summarizing

similarities and differences among objects, events, people, and conditions in the environment (e.g., Holland et al., 1986). What is at issue is whether categorical information is taxonomically organized. We have already noted that cognitive taxonomies have been found to be useful descriptions of empirical data in a number of applications in computer science, psychology, and anthropology. The above empirical examples from managerial respondents are themselves evidence that individuals can provide quite interpretable taxonomic structures when they are prompted to do so with the appropriate question frames. Nevertheless, a number of researchers have openly questioned the role of "pure" hierarchical knowledge representations. At minimum, Anderson's (1983) contention that categorical information is organized as a "tangled hierarchy" complicates a straightforward taxonomic approach by implying that conceptual categories can have multiple superordinates linked together in network fashion. Indeed, it is not quite clear whether a hierarchical approach to human conceptual structure is any better in describing the relevant data than a purely non-hierarchical network organization (e.g., Sanford, 1985). Hunn (1982) has argued that, at least in some areas of folk classification, a conceptual structure consisting of "core" and "periphery" categories fits the empirical data better than does a strictly hierarchical description. Randall (1976) has been even more strident in his objections to a taxonomic approach in suggesting that the well-formed hierarchies characteristic of much of the anthropological evidence for

cognitive taxonomies are results of on-the-spot inferences by respondents rather than deep-seated conceptual structures.

We prefer to view this issue in relatively mundane terms as an empirical question. The assumption that managerial cognitive categories are taxonomically organized is useful in explaining certain aspects of competitor definition. However, it is probably the case that conceptual organization has many forms, and that a taxonomic structure may not describe all areas of managerial knowledge. The surfaces of many events confronting the managerial mind are often too unstable to understand in a rigidly taxonomic fashion. Variations in expertise, interests, and environmental characteristics insure that significant gaps will exist in a manager's categorical knowledge about many things. Unfortunately, research and theory on managerial cognitive organization is much too undeveloped to clarify the nature of the mental representation of managerial situations. Until more work is done, we advocate extending a taxonomic analysis of conceptual structure as far as it will go before becoming misleadingly inappropriate.

Proposition II: Decision-makers define their own organization by matching its salient attributes to the typical attributes of perceived organizational categories.

Abell (1980) has argued that before an organization can formulate a course of competitive strategy, it must have a

"concept" or definition of its own activities and goals. Similarly, Porter (1980) suggested that organizations must regularly ask such basic questions as "What type of business are we in?" These arguments suggest that a primary function of a mental classification scheme is to provide the decision-maker with the knowledge and nomenclature to answer basic questions of organizational identity. This is consistent with Alpert and Whetten (1985) who have argued that "Organizations define who they are by creating or invoking classification schemes and locating themselves within them" (p. 267). By placing the organization within the context of a cognitive taxonomic system, the decision-maker makes sense of the organization's activities in relation to others within the environment.

Defining an organization in this way entails matching the known attributes of the focal organization with the typical attributes of organizational categories. The comparison can occur within a backward-looking, contemporaneous, or forward-looking time frame. Thus, for example, a restaurateur might note that "We were a typical 'American-style steak house' but are now more of a 'Continental restaurant'." Here, the taxonomic self-definition compares past and present organizational attributes simultaneously with the typical attributes of common restaurant types. As Porter (1980) suggested, organizational definitions can be stated in both descriptive (e.g., "We are a 'Continental restaurant'.") and purposive (e.g., "We want to be a 'Continental restaurant'.") form. In either case, the

strategist's implicit cognitive structures are being brought to bear as sensemaking tools to provide a personally and culturally reinforcing nomenclature for defining what the organization is or wants to be.

In addition to cognitive categories of organizational forms, this comparison process requires that strategists possess a mental representation of their own organization's characteristics and capabilities. Such a representation could be an organizational analog to the "self schemas" uncovered by social psychologists in personality research (e.g., Markus, 1977). Although definitions of the term "schema" have varied in the literature, most theorists assume that schemata represent unitized cognitive structures consisting of concepts and relations mapping particular informational domains (e.g., Anderson, 1980; Rumelhart, 1980). Markus (1977) extended the schema notion to the self-concept by arguing that individuals develop mental representations of their own essential personality characteristics. Similarly, it is likely that managers have relatively well-defined schemas identifying the essential features of their own organizations.

Although little research has been done on managerial organizational schemata, there is suggestive evidence in the strategy literature. In studies by Hawes and Crittendon (1984), Dess and Davis (1984), and Fombrun and Zajac (1987), managers described their own organizations with attributes defined by researchers from existing theories of strategy. For example, in

the Dess and Davis (1984) study, managers described their business on such dimensions as "customer service," "manufacturing innovativeness," "outside financing," "product range," "operating efficiency," and so forth. In all of these studies, the resulting ratings formed meaningful non-random clusters indicating systematic differences in the ratings of managers across firms in the sample. The possible existence of organizational schemata raises interesting questions regarding the interorganizational comparison process. For example, when managerial schemata are complex, interorganizational comparisons and self-definitions might be more difficult than when such schemata are simple. Empirical questions of this sort need to be fleshed out more carefully in future research.

Proposition III: The matching of a focal organization and a cognitive category takes place at intermediate levels of generality in a decision-maker's cognitive taxonomy.

The fact that cognitive categories are hierarchically organized suggests that any given organization can be matched to inclusive categories at more than one level of generality. An "upscale men's clothing store" can simultaneously be labeled a "men's clothing store," a "clothing store," and a "retailer." At what level of abstraction is the organization defined? Although the specific level of definition could vary from circumstance to circumstance, depending upon the sensemaking demands of the

situation, theory and evidence from cognitive science suggests that one level of a cognitive taxonomy is more informative and "basic" than others. Rosch et. al., (1976) have suggested that ". . . the basic level of abstraction in a taxonomy is the level at which categories carry the most information, possess the highest cue validity, and are thus most differentiated from each other" (p. 383).

Data provided by Rosch et. al. and others (e.g., Murphy & Smith, 1982; Adelson, 1985; Rifkin, 1985) suggest that this basic level is usually of an intermediate level of generality. Very abstract cognitive categories have too few attributes to be very informative of environmental structures, and extremely specific categories are often very overlapping, perhaps being different in only one or two attributes. Rosch et al., suggest that intermediate cognitive categories usually are the categories which are both rich enough to provide useful information and distinct enough to be non-redundant. Thus, such categories act as a conceptual center of gravity around which knowledge about environmental entities is organized.

The existence of a basic taxonomic level in the cognitive categorization of organizational forms should be apparent in a number of ways. When asked to label organizations spontaneously, decision-makers should use middle-level category names. Moreover, middle-level category attributes should be the most easily remembered and the most easily recalled. The salience of such categories should lead decision-makers to use middle-level

categories and their attributes to match to the focal organization, and thus the definition of the focal organization should occur at intermediate levels of cognitive abstraction. Although situations could arise where strategists use category nomenclature of greater or lesser degrees of abstraction when attempting to make sense of the interorganizational environment, Proposition III argues that, other things being equal, organizational definitions will tend to orient toward middle-level category names.

Direct evidence supporting Proposition III has been obtained in a recent study by Porac and Thomas (1988). In this study, managers of "groceries" in a small midwestern U.S. town were asked to name various types and subtypes of retail groceries in the local area. A four-level taxonomy was identified, beginning with the general category "retailers" and progressing through "groceries," "convenience stores" and "supermarkets," and ending with specific types of convenience stores ("selling gas" vs. "not selling gas") and supermarkets ("warehouse" vs. "full-service"). In a second stage of the research, managers were asked to classify spontaneously their own organization. The majority of respondents used the two middle-level categories of "supermarkets" and "convenience stores" as best fitting their business.

Proposition IV: Once the focal organization has been matched to a particular category label, organizations within that category

will be considered stronger competitors than organizations not included within that category.

This proposition links the cognitive categorization schemes of strategists to the definition of competitive boundaries. Proposition IV implies that organizations outside of the defined set of rivals will be viewed as weaker competitors, will be monitored less closely, and thus understood more poorly than organizations included within the category. When combined with Proposition III, this suggests that competitive boundaries and competitive scanning are fairly narrowly focused, since category boundaries at middle-levels of abstraction will be somewhat specific. Indeed, this is precisely why cognitive classification schemes are useful--they provide a summary of the broad interorganizational environment that is reasonable enough to allow decision-makers to restrict the scanning of potential competitors to a cognitively tractable number of other organizations. Once the focal set of rivals has been defined, competitive strategies can be formulated to counter and/or defend against the actions of this more restricted group. This argument is consistent with recent theoretical discussions of organizational adaptation. Aldrich, McKelvey, and Ulrich (1984), for example, have argued that when well-formed populations of organizations exist, adaptation occurs at the "micro-niche" level by organizations adjusting to the actions of competitors occupying the same resource positions. In such cases, adaptation

is less a revolutionary reconstruction of an organization's basic attributes than it is a series of minor modifications designed to maintain a viable position vis-a-vis a small set of known rivals. Indeed, Aldrich et al. (1984) define "competitive strategy" as the planning of such micro-adjustments to a narrowly defined collection of other similar organizations.

The narrow focus of competitive boundaries and scanning has been confirmed in studies by Gripsrud and Gronhaug (1985) and Porac and Thomas (1988). In the former study, managers of grocery stores in a small Norwegian town were interviewed and asked to list as many "competitors" as they could think of. According to Gripsrud and Gronhaug's account, approximately 50 local firms could roughly be considered "groceries" and yet ninety percent of the managerial respondents cited five or fewer organizations as competitors. Porac and Thomas (1988) provided managers of retailing stores in a small town with 52 different categories of local retailers (e.g., "clothing stores," "grocery stores," "book shops," etc.) and asked them both to place their own business within a category and to rate the extent to which each category was a competitor of their particular firm. For almost all respondents, firms outside of the manager's own business category were not considered competitors at all.

The category-based competitive definition implied by Proposition IV raises three issues concerning the link between cognitive classifications and the definition of rival organizations. First, a cognitive account is considerably

broader than traditional market and industry criteria for ascertaining competitors since the attributes defining the focal category can be any number of perceived organizational characteristics. Thus, markets, technological skills, size, location, labor, capital asset structures and so on can all be used as a basis for discriminating competitors from non-competitors if such attributes are perceived to define the category into which the strategist places the focal organization. In this regard, data presented by Porac et al. (1989) reinforce the fact that perceived competitive distinctions do not always correspond to solely market or technological isomorphisms. Studying Scottish knitwear manufacturers, Porac et al. found evidence suggesting that attributes involving geographical (in or near Scotland and thus possessing the "Scottish image"), market (top 5% of wage earners in any given country), and technological (ability to use cashmere to produce high quality classic knitwear) characteristics were simultaneously used by top managers of these firms to delimit the relevant set of competitors. For Scottish producers, this constellation of characteristics defines a firm as a member of the Scottish knitwear competitive group.

Second, Proposition IV implies that decision-makers will tend to downplay and perhaps even ignore "interspecies" competition, even when such competition exists. Competition between two types of organizations is present when the growth rate of one group negatively influences the growth rate of the

other (Hannan & Freeman, 1988). Salancik (Note 1), for example, observed that the rise of "fast food restaurants" in a small midwestern U.S. town was associated with a decline in the number of "snack bars." Hannan and Freeman (1988) note that such interspecies competition is often indirect and not readily apparent. In such cases, the tendency of strategists to orient toward organizations perceived as being in the same category as the focal organization should result in less intensive interspecies competitive comparisons. Cognitive taxonomies orient managers to similar rather than dissimilar sources of rivalry. Of course, exceptions will exist, particularly in cases where significant environmental scanning resources can be brought to bear upon the problem of monitoring the competition. For example, McDonald's Corporation has recently begun to consider the impact on their core fast food business of microwave children's meals being marketed by packaged food companies (Key, 1989). In this case, a large sophisticated organization is monitoring a competitive threat that is perceived to be outside of the focal organization's business type. Presumably, this is because of a well-understood definition of rivals as companies who sell quickly prepared foods to growing families.

A final issue raised by Proposition IV is whether all organizations defined as members of the focal competitive set are considered equally strong rivals. Cognitive categorization theory (Rosch, 1978) would suggest that organizations within the focal category are perceived as varying in how well they

represent the central tendencies of the category as a whole. The non-equivalence of category members would seem to promote dual pressures in the definition of competition. On the one hand, category "prototypes" would be those organizations that are most typical and should act as cognitive reference points around which competitive definitions are centered. Prototypical organizations should thus be used more heavily as benchmarks in the formulation of competitive strategy. On the other hand, there should also be pressure to consider firms most similar to the focal organization as strongest rivals, a within-category extension of Proposition IV's claim that competitive scanning is biased toward similar others. Thus, for example, within the category "fast food restaurants" McDonald's should consider Burger King and Wendy's to be more significant competitive benchmarks than Pizza Hut or Taco Bell. Under what conditions similarity and prototype definitions of competitors will be strongest is a matter for future research.

Proposition V: Changes in competitive definitions can be viewed as creative recategorizations of the focal organization via vertical shifts to a different level of perceived abstraction, horizontal shifts along the same level, and/or the creation of new categories altogether.

Competitive comparisons are a result of scanning and interpreting cues from the interorganizational environment in a

creative and problem-solving way. The strategist's mental model can act as both an inhibiting factor in the generation of unique approaches to organizing as well as a source of much creative inspiration. Once a decision-maker has defined the relevant competitive category, at whatever taxonomic level, organizational comparisons are likely to be locked in by the structuring effect of the category as it has been defined. This structure provides the foundation upon which much of the environment is understood. Since new information about changes in the environment is interpreted from the perspective of a current organizational definition, a mental model acts as a subtle filtering device removing anomalous data. A certain degree of cognitive inertia is to be expected because of the fixation on a particular competitive boundary at a particular point-in-time.

On the other hand, cognitive taxonomies develop over extended periods of time and contain much of what is important to know about a particular interorganizational environment. By actively using the entire array of conceptual knowledge at his or her disposal, the strategist can gain creative insights into alternative forms of organization. The motivation to look beyond immediately perceived competitive boundaries might come from events in the environment, from expert suggestions, or from personal reflection. When such creative recategorizations do occur, however, they are likely to follow one of three trajectories. First, a decision-maker can shift the definition of the competitive group to a higher or lower level of

abstraction, as when a "bank" manager redefines the business as a "financial services" company, or a "knitwear" manufacturer reclassifies the business as "high quality knitwear." Second, competitors can be redefined horizontally, as when an owner of an "Oriental food store" begins to reconceptualize the business as a "supermarket." Finally, entirely new conceptual categories can be invented by creatively recombining the attributes of different existing organizational forms. For example, a new type of restaurant category might be defined when attributes of several existing restaurant types are combined into a single organization. This sort of creative recombination could very well be part of the cognitive bases for entrepreneurial innovations (Hannan & Freeman, 1988).

CONCLUSIONS AND EXTENSIONS

The above arguments are not a complete cognitive theory of competitive strategy nor even of competitor definition. We have formulated the five propositions to provide a core cognitive framework around which additional research and theory must be developed. As such, our arguments are incomplete in at least three ways. We have not dealt with the case where managerial categorizations are ill-defined such that cognitive taxonomies cannot be used in the process of defining and monitoring organizational rivals. Such might be the case, for example, in newly emerging or highly volatile environments where stable categories of organizations are not discoverable by the

managerial mind. Moreover, we have not dealt adequately with the process of defining competitors and how the use of cognitive taxonomies is embedded within more global strategy formulation activities. Depending upon one's view of managerial judgment and decision-making, competitive definition could be viewed as a relatively rational interorganizational comparison process (e.g., Hofer & Schendel, 1978), or as a set of problematic inferences influenced by "quasi rational" factors such as post hoc justifications (e.g., Staw, 1980) and "organizational programs" (e.g., March & Simon, 1958). Our approach is relatively neutral on this issue, since we are arguing only that strategists attempt to match the characteristics of their own organization to those of perceived organizational categories. The specific motivation for this matching process (i.e., political, organizational, cultural, etc.), and whether the matching is complete or satisficing, are issues outside the scope of our framework. Finally, we have not dealt with the behavioral consequences of defining competitors in a particular way. Once an organization has been defined as a competitor, strategists of the focal organization have any number of behavioral choices to make regarding the appropriate means of dealing with the competitive threat (e.g., prices, quality, service, acquisition, joint ventures, new products, etc.). How these choices are made is also beyond the scope of our arguments.

Within these limitations, however, a cognitive approach to competitive definition extends the existing organizational and

strategy literatures in a number of useful ways. At minimum, a cognitive approach to competitor definition has implications for scientific taxonomies of organizational forms. Arguments have been made in various literatures promoting the classification of "industries" (e.g., Standard Industrial Classification, 1972), "product markets," (e.g., Weitz, 1985), "strategic groups" (Porter, 1980; McGee & Thomas, 1986), and "organizational species" (McKelvey, 1982). The goal of all such arguments is to simplify organizational diversity and identify competitive discontinuities from an "objective" or analytical point-of-view. Our research departs from this perspective somewhat by suggesting that it is meaningful to describe competitive boundaries from an insider's "subjective" point-of-view. At minimum, "cognitive systematics" is a useful adjunct to more numerically-based classification procedures (Porac & Thomas, 1987). McKelvey and Aldrich (1983) noted the difficulty of classifying organizational forms and suggested that "conventional wisdom" is a necessary ingredient in isolating groups of organizations to describe. In this sense, the perceptions of managers operating within an environment can be used to make tentative first cuts in the description of organizational populations. Porter (1980) made a similar point in outlining procedures for identifying intra-industry strategic groups. A focus upon managerial taxonomies merely makes systematic the managerial commonsense that has been previously investigated in a rather ad hoc way.

More interestingly, a cognitive approach raises the

possibility that managerial definitions of organizational forms essentially define the most important competitive groups. Weick (1979) argued that organizations often create their environments by constructing interpretations and then acting as if such interpretations are true. When extended to the problem of competitive definition, Weick's argument gives substance to Robinson's (1956) claim that boundaries among firms might be important only because they exist in the minds of managers. Indeed, managerial classification schemes provide the cognitive foundation for the mutual awareness discussed by White (1981) as inherent in competitive interactions. Thus, for example, when a group of managers define their businesses as "clothing stores" or "supermarkets" their understanding of the competitive environment is crystallized within a mental model, and their competitive focus is slanted toward organizations they perceive as members of the same competitive set. It is easy to see how such perceptions might eventually become objectified and institutionalized through such devices as trade associations, specialized publications, and a particularistic language for describing local ecological conditions. In the philosopher Wittgenstein's (1958) terms, "industries," "strategic groups," and so forth might be language games in which participants enact mental models specifying who should be watching whom. In this view, competitive groups are more than the analytical and economic abstractions of researchers; they represent the social psychological reality for member organizations. If this subjectivist perspective holds, it

will be impossible to classify and understand organizational forms, at least at the micro-niche level, without describing the mental models which motivate mutually adjustive competitive activities.

Porac et. al.'s (1989) study of Scottish knitwear producers illustrates the basic features of competitive enactment. According to these researchers, this group of 17 firms in and around Scotland accounts for only 3% of total world-wide production of knitted outerwear. Producers from Italy, the Far East, the U.S., and even others within the UK far outstrip the Scots in total output. However, when asked to define their competitors, top executives of Scottish firms typically cite only the other Scottish firms in the group. According to Porac et. al., this narrow competitive definition has focused the attention of strategists inward in an effort to find ways of competing among essentially similar Scottish companies. A generic "recipe" (Huff, 1982) seems to have emerged for such competition: buy yarn from local spinners, manufacture expensive cashmere sweaters in classic designs that will appeal to high income consumers, and sell to exclusive specialty shops and department stores through commissioned agents around the world. This generic strategy, coupled with norms against price competition, has limited the range of strategic possibilities for individual firms within the group. According to Porac et. al., firms attempt to differentiate themselves only by offering subtle variations in color and design within the classic motif. More radical

departures in strategy, such as using innovative fibers, colors, fashion designs, and marketing arrangements are typically not considered by Scottish managers, and if they are considered, are frowned upon. The Scottish case illustrates how a well-developed mental model of the competition can become intertwined with strategic choices in the marketplace to influence the material conditions of rivalry within a group of organizations. A similar case has been discussed by Yates (1984) in a study of the U.S. automobile industry and its "Detroit mind."

Competitive enactment has important implications for traditional arguments relating market structure to competitive interdependence. In industrial economic theory, market structure is seen to range from pure competition, where many small firms with low market power struggle for survival, to pure monopoly, where a single firm dominates as the sole supplier of goods or services (Scherer, 1980). The mutual awareness characterizing competitive enactment is typically considered a feature of oligopolistic environments where moderate degrees of concentration lead to organizations being strategically interdependent (Pennings, 1981). A cognitive approach, however, suggests that even in relatively atomistic environments strategists construct a subjective reality of cognitive oligopolies to make sense of local competitive conditions. We have suggested that such cognitive activity stems from the press to simplify interorganizational comparisons. Many theorists have argued that organizations attempt to reduce or absorb

environmental uncertainty (e.g., Pfeffer & Salancik, 1978; Thompson, 1967). The use of mental models to impose order upon volatile competitive conditions is one way uncertainty can be reduced. Festinger (1954) argued thirty years ago that individuals will use similar others to obtain information about the validity of opinions, capabilities, and behaviors when objective benchmarks are unavailable. A cognitive taxonomy, creating an oligopolistic subjective reality, allows strategists to compare the focal organization to similar others, thereby obtaining useful information about the organization's strengths and weaknesses.

The structuring effect of a mental model raises questions about the ability of strategists to reconceptualize their competitive environment when patterns of interorganizational relationships change. Freeman and Hannan (1983) have argued that competition is a mediating link between environmental change and organizational performance. When environmental contingencies shift, new forms of competition emerge to challenge an organization's once protected position. In such circumstances, successful adaptation would seem to require that decision-makers redefine competitive groups accordingly. However, Hannan and Freeman (1977; 1988) have argued that inertial forces often prevent an organization from adapting in this way. It would seem that one important source of inflexibility is the cognitive inertia that stems from the presence of a well-formed cognitive taxonomy. Anecdotal evidence for such inertia abounds in the

literature. For example, managers of Atlantic and Pacific Tea Company seemingly failed to reconceptualize their "food business" to counter the actions of competitors who had begun to sell non-food items with higher profit margins (Astley, 1984). Similarly, Levitt's (1975) well-known discussion of U.S. railroads suggests that railroad executives might have averted decline by redefining their businesses as "transportation companies." One might speculate that such competitive blind spots were induced by anachronistic mental models framing an environment that no longer existed.

Finally, our approach adds to the literature on managerial cognition. Given the increased attention to managerial interpretations of environments (e.g., Daft & Weick, 1984; Smircich & Stubbart, 1985; Sims & Gioia, 1986), a number of attempts have been made to ascertain the nature of managerial cognitive structures. Most of the discussion has centered upon the characteristics and influence of "causal maps" (e.g., Bougon, Weick, & Binkhorst, 1977; Ford & Hegarty, 1981; Salancik & Porac, 1986; Stubbart & Ramaprasad, 1987). While useful, cause maps represent only one form of cognitive structure, and a taxonomic approach to mental models is somewhat promising because it adds another dimension to research and theory concerning the managerial understanding of environmental phenomena. This is especially the case because established methods exist within various cognitive sciences for uncovering taxonomic cognitive structures (e.g., Kempton, 1981; Mervis & Rosch, 1981). Although

we have stressed the role that such structures play in the definition of competitive boundaries, there is no reason to limit the study of taxonomic mental models to only this particular concern. In an important development, for example, Dutton and Jackson (1987) have used a categorization approach to understand the labeling of strategic issues. Hopefully, a greater understanding of managerial classification will result from such efforts.

Figure 1

Cognitive Taxonomy of Computer Programming
Experts for Algorithms and Data Structures
(from Adelson, 1985)

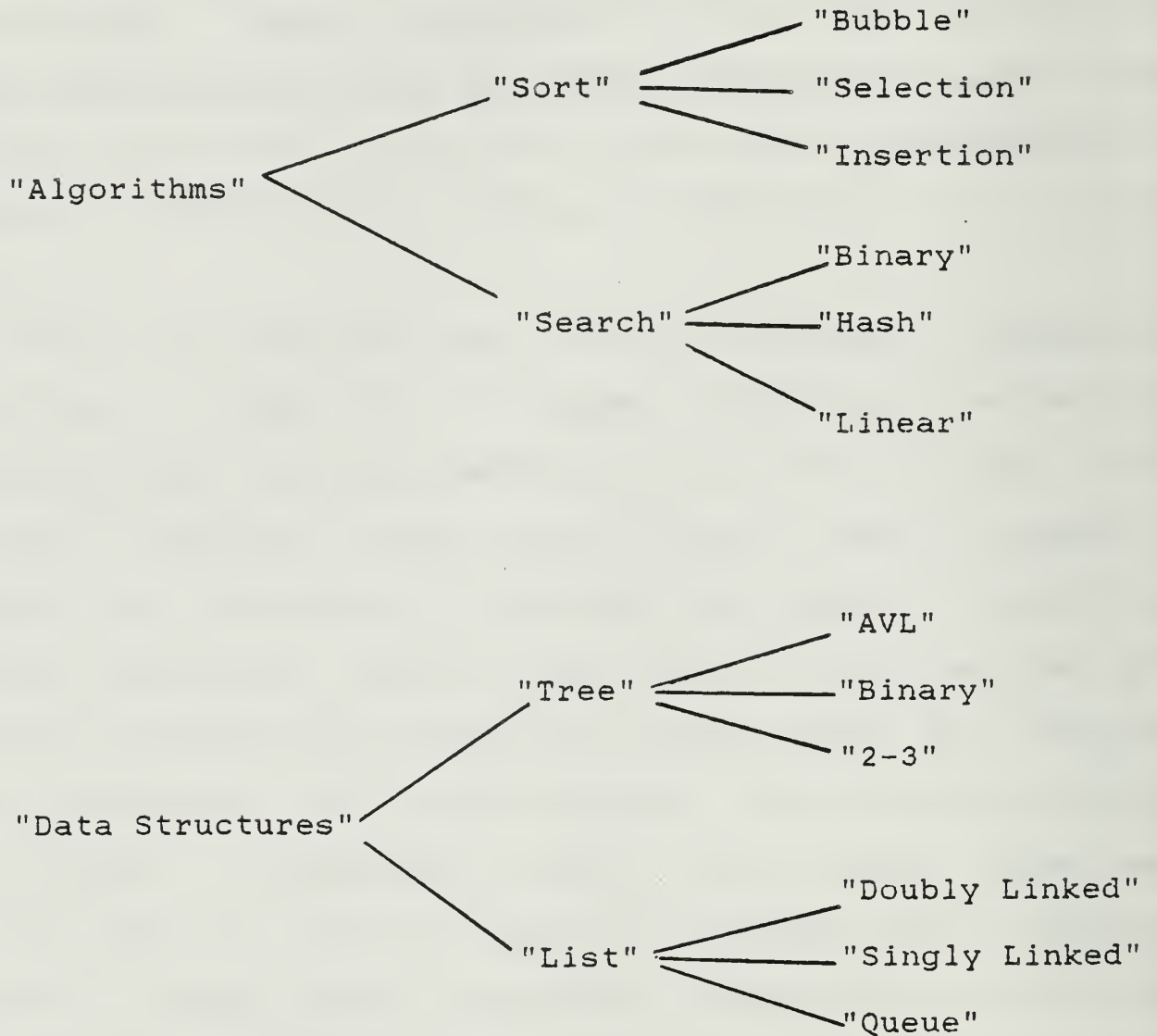
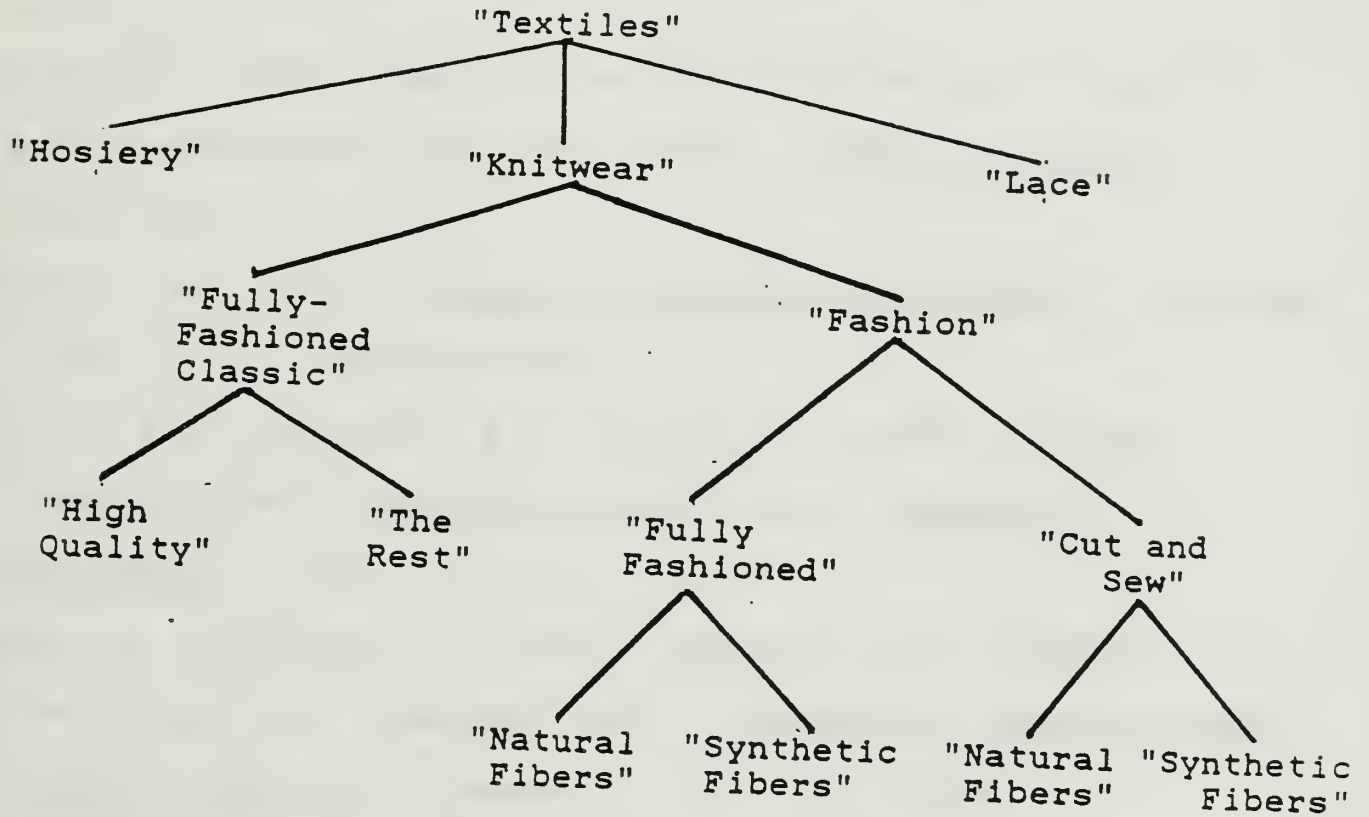


Figure 2

Elicited "Cognitive Taxonomy" of One Managing Director
Of A Scottish Knitwear Firm^{1,2}
(from Porac et. al, in press)



REFERENCE NOTES

Salancik, G.R. Data presented at a colloquium on the ecology of organizational forms at the University of Illinois at Urbana-Champaign, Spring, 1989.

REFERENCES

- Abell, D. F. (1980). Defining the business: A starting point for strategic planning. Englewood Cliffs, N.J.: Prentice-Hall.
- Adelson, B. (1985). Comparing natural and abstract categories: A case study from computer science. Cognitive Science, 9, 417-430.
- Aldrich, H.E. (1979). Organizations and environments. Englewood Cliffs, N.J.: Prentice-Hall.
- Aldrich, H.E., McKelvey, B., & Ulrich, D. (1984). Design strategy from a population perspective. Journal of Management. 1984, 10, 67-86.
- Alpert, S. & Whetten, D. (1985). Organizational identity. In B.M. Staw & L.L. Cummings (Eds.), Research in organizational behavior (Vol. 7). Greenwich, CT.: JAI Press.
- Anderson, J.R. (1980). Cognitive units. In Nebraska symposium on motivation. Lincoln: University of Nebraska Press.
- Anderson, J.R. (1983). The architecture of cognition. Cambridge, MA.: Harvard University Press.
- Berlin, B., Breedlove, D.E., & Raven, P.H. (1974). Principles of Tzeltal plant classification: An introduction to the botanical ethnography of a Mayan-speaking community of highland Chiapas. New York: Academic Press.
- Bougon, M., Weick, K. & Binkhorst. (1977). Cognition in organizations. Administrative Science Quarterly, 22, 609-632.

- Collins, A.M., & Quillian, M.R. (1969). Retrieval time from semantic memory. Journal of Verbal Learning and Verbal Behavior, 8, 240-247.
- Daft, R.L., & Weick, K.E. (1984). Toward a model of organizations as interpretation systems. Academy of Management Review, 9(2), 284-295.
- Day, G.S., Shocker, A.D., & Srivastava, R.K. (1979). Customer-oriented approaches to identifying product markets. Journal of Marketing, 43, 8-19.
- Dess, G.G., & Davis, P.S. (1984). Porter's (1980) generic strategies as determinants of strategic group membership and organizational performance. Academy of Management Journal, 27,
- Dougherty, J.W.D. (1978). Saliency and relativity in classification. American Ethnologist, 5, 66-80.
- Dutton, J.E., & Jackson, S.E. (1987). Categorizing strategic issues: Links to organizational action. Academy of Management Review, 12, 76-90.
- Festinger, L. (1954). A theory of social comparison processes. Human Relations, 7, 117-140.
- Fombrun, C.J., & Zajac, E.J. (1987). Structural and perceptual influences on industry stratification. Academy of Management Journal,
- Ford, J.D., & Hegarty, W.H. (1984). Decision-maker's beliefs about the causes and effects of structure: An exploratory study. Academy of Management Journal, 27(2), 271-291.

- Freeman, J., & Hannan, M. (1983). Niche width and the dynamics of organizational populations. American Journal of Sociology, 88, 6, 1116-1145.
- Gripsrud, G. & Gronhaug, K. (1985). Structure and strategy in grocery retailing: A sociometric approach. The Journal of Industrial Economics, 33, 339-347.
- Hannan, M. & Freeman, J. (1977). The population ecology of organizations. American Journal of Sociology, 82, 929-964.
- Hannan, M. & Freeman, J. (1988). Organizational ecology. Cambridge, MA: Harvard University Press.
- Hawes, M. J. & Crittendon, F.W. (1984). A taxonomy of competitive retailing strategies. Strategic Management Journal, 5, 1984, 275-287.
- Hodgkinson, G. & Johnson, G. Cognitive aspects of competitive strategy: The case for a processual approach. Paper presented at the conference on Managerial Thinking in Business Environments, Boston, 1987.
- Hofer, C. & Schendel, D. (1978). Strategy formulation: Analytical concepts. St Paul: West Publishing.
- Holland, J.H., Holyoak, K.J., Nisbett, R.E., & Thagard, P.R. (1986). Induction: Processes of Inference, Learning, and Discovery. Cambridge, MA: MIT Press.
- Huff, A.S. (1982). Industry influences on strategy formulation. Strategic Management Journal, 3, 119-130.
- Hunn, E. (1982). The utilitarian factor in folk biological classification. American Anthropologist, 84, 830-847.

- Kelly, G.A. (1955). The psychology of personal constructs.
New York: W.W. Norton.
- Kempton, W. (1978). Category grading and taxonomic relations.
American Ethnologist, 5, 44-65.
- Kempton, W. (1981). The folk classification of ceramics: A Study of Cognitive Prototypes. New York: Academic Press.
- Key, J. (1989). Back-to-the-kitchen products proliferate.
Chicago Tribune, Saturday, May 20.
- Khandwalla, P.N. (1981). Properties of competing organizations. In P. C. Nystrom & W. Starbuck (Eds.), Handbook of organizational design (V. 1). New York, NY: Oxford University Press.
- Kiesler, S. & Sproull, L. (1982). Managerial responses to changing environments: Perspectives in problem sensing from social cognition. Administrative Science Quarterly, 27, 548-570.
- Levitt, T. (1975). Marketing myopia. Harvard Business Review, September-October.
- March, J. & Simon, H.A. (1958). Organizations. New York: John Wiley.
- Markus, H. (1977). Self schemata and processing information about the self. Journal of Personality and Social Psychology, 35, 63-78.
- McGee, J. & Thomas, H. (1986). Strategic groups: Theory, research and taxonomy. Strategic Management Journal, 7, 141-160.

- McKelvey, B. (1982). Organizational systematics. Berkeley, CA: University of California Press.
- McKelvey, B. & Aldrich, H.A. (1983). Populations, natural selection, and applied organizational science. Administrative Science Quarterly, 28, 101-128.
- Mervis, C. & Rosch, E. (1981). Categorization of natural objects. Annual Review of Psychology, 32, 89-115.
- Murphy, G.L., & Smith, E.E. (1982). Basic level superiority in picture categorization. Journal of Verbal Learning and Verbal Behavior, 21, 1-20.
- Nightengale, J. (1978). On the definition of industry and market. Journal of Industrial Economics, 27, 31-40.
- Pfeffer, J. & Salancik, G.R. (1978). The external control of organizations. New York, NY: Harper & Row.
- Pennings, J. M. (1981). Strategically interdependent organizations. In P. Nystrom & W.H. Starbuck (Eds.), Handbook of organizational design. Oxford University Press.
- Porac, J. & Thomas, H. (1987). Cognitive taxonomies and cognitive systematics. Paper presented at the annual convention of the Academy of Management, New Orleans, LA.
- Porac, J. & Thomas, H. (1988). Cognitive taxonomies in managerial competitive sensemaking: Evidence from retailing. Paper presented at the Second Annual Conference on Information Processing in Organizations, SUNY-Buffalo.
- Porac, J., Thomas, H., & Baden-Fuller, C. (1989). Competitive groups as cognitive communities: The case of Scottish

- knitwear manufacturers. Journal of Management Studies, 26, 397-416.
- Porter, M.E. (1980). Competitive strategy. New York: Free Press.
- Randall, R.A. (1976). How tall is a taxonomic tree? Some evidence for dwarfism. American Ethnologist, 3, 543-553.
- Reger, R. K. Competitive positioning in the Chicago banking market: Mapping the mind of the strategist. Unpublished doctoral dissertation, University of Illinois at Urbana-Champaign, 1987.
- Rifkin, A. (1985). Evidence of a basic level in event taxonomies. Memory and Cognition,
- Robinson, J.T. (1956). The industry and the market. Economic Journal, 66, 360-361.
- Rosch, E. (1978). Principles of categorization. In E. Rosch & B. Lloyd (Eds.), Cognition and categorization. Hillsdale, NJ: Lawrence Erlbaum.
- Rosch, E. & Mervis, C. (1975). Family resemblances: Studies in the internal structure of categories. Cognitive Psychology, 7, 573-605.
- Rosch, E., Mervis, C., Gray, W., Johnson, D., & Boyes-Braem, P. 1976). Basic objects in natural categories. Cognitive Psychology, 8, 382-439.
- Rumelhart, D.E. (1980). Schemata: The building blocks of cognition. In R.J. Spiro, B.C. Bruce, & W.F. Brewer (Eds.), Theoretical issues in reading comprehension. Hillsdale, NJ:

Lawrence Erlbaum Associates.

- Rumelt, R. P. (1984). Towards a strategic theory of the firm. In R.B. Lamb (Ed.), Competitive strategic management. Englewood Cliffs, N.J.: Prentice-Hall.
- Rumelt, R. P. (1987). Theory, strategy, and entrepreneurship. In D.J. Teece (Ed.), The competitive challenge. Cambridge, MA: Ballinger Publishing Co.
- Salancik, G.R. & Porac, J.F. (1986). Distilled ideologies. In Sims, H. and Gioia, D. (Eds.), The thinking organization. San Francisco: Jossey-Bass.
- Sanford, A.J. (1985). Cognition and cognitive psychology. New York: Basic Books.
- Schank, R. (1982). Dynamic memory.
- Scherer, F.M. (1980). Industrial market structure and economic performance (2nd. Ed.). Chicago, IL: Rand-McNally.
- Shubik, M. (1959). Strategy and market structure. New York: Wiley.
- Sims, H. & Gioia, D. (1986). The thinking organization. San Francisco: Jossey-Bass.
- Smircich, L. & Stubbart, C. (1985). Strategic management in an enacted world. Academy of Management Review, 10, 724-736.
- Smith, E.E. & Medin, D.L. (1981). Categories and concepts. Cambridge, MA: Harvard University Press.
- Standard Industrial Classification Manual. (1972). Department of Management and the Budget.

- Staw, B.M. (1980). Rationality and justification in organizational life. In B. Staw and L. Cummings (Eds.), Research in organizational behavior. Greenwich, Conn: JAI Press.
- Stubbart, C. & Ramaprasad, A. (1987). Probing two chief executives beliefs about the steel industry using cognitive maps. In Advances in strategic management, 7, 1987.
- Teece, D.J. (1987) The competitive challenge. Cambridge, MA: Ballinger Publishing Co.
- Thompson, J.D. (1967). Organizations in action. New York: McGraw-Hill.
- Walton, E.J. (1986). Managers' prototypes of financial firms. Journal of Management Studies, 23(6), 679-698.
- Weick, K.E. (1979). The social psychology of organizing. Reading, MA: Addison-Wesley.
- Weitz, B.A. (1985). Introduction to special issue on competition. Journal of Marketing Research, 22, 229-36.
- Wittgenstein, L. (1958). Philosophical investigations. London: Blackwell.
- White, H.C. (1981). Where do markets come from. American Journal of Sociology, 83, 517-547.
- Yates, B. (1984). The decline and fall of the american automobile industry. New York: Vintage Books.

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