GENDER DIFFERENCES ON THE "WIDTH" DIMENSION OF CATEGORY STRUCTURE: A CASE OF BRAND TYPICALITY

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The objective of this research is to consider how gender differences in processing may potentially manifest themselves in categorical/cognitive structures that are constructed differently from one another. Thus, by utilizing the construct of "typicality," interest lies in determining if men and women differ in their assessments of category member similarity. Employing the "Theory of Selectivity," a theoretical framework is proposed that links gender differences in processes of attention to differences in the construction of category structures. Results garnered from this research indicate that males and females differ in their perceptions of product/brand equivalence. Consequently, male/female differences in the formation of brand consideration sets as well as differences in how marketers might endeavor to position their brands are some of the managerial implications that are discussed based on this study's findings.

INTRODUCTION

During the past few years, there has been a considerable amount of media interest directed toward gender differences in the acquisition, processing, and storage of information. For example, an article (Vasich 2005) located on the University of California, Irvine (UCI) website explicated a scientific study that discovered that males and females possess disproportionate amounts of gray and white brain matter. Males were identified as possessing higher concentrations of gray (versus white) matter, while females were discovered to have higher levels of white (versus gray) matter. An implication drawn from this discovery was that males and females appear to pursue different routes in problem solving, even in cases where an identical solution is reached (Vasich 2005). Additionally, in a recent issue of a popular financial magazine, a feature article attempts to synthesize some of the scientific discoveries that have been made over the past two decades with respect to differences between the male and female brains (Pincock 2006). Cursory descriptions of gender differences in the processing of sensory information and in the differential use of the right and left brain hemispheres for select tasks were among some of the topics highlighted in this issue. Consequently, in light of these examples along with all of the other varied streams of academic research that have been dedicated to exploring and explicating gender differences in information processing (e.g., Blum 1997; Hansen 1981; Moir and Jessel 1991), the objective of this research is to consider how these differences in processing may potentially manifest themselves in categorical/cognitive structures that are constructed and organized differently from one another. Thus, the primary intent of this research piece is to examine the internal structure of categories from the vantagepoint of category membership. Specifically, by utilizing the construct of "typicality," interest lies in determining if men and women differ in their assessments of category member similarity. Consequently, the nature (i.e., composition) of these similarity assessments, as well as their relative dispersion within a specified category, will be investigated. Furthermore, the marketing

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implications of this potential gender difference will also be addressed.

GENDER DIFFERENCES IN PROCESSING

Although researchers from varied disciplines have studied male/female differences in the allocation of attentional resources (e.g., Grabe and Kamhawi 2006; Pease and Pease 2000), there has been one researcher who has made significant strides in explicitly linking attentional resource allocation to choice of processing strategy. In several research studies conducted by Meyers-Levy (1986, 1988, 1989), it was found that males and females differentially allocated the cognitive resources they devoted to a processing task. According to the "Theory of Selectivity" (Meyers-Levy 1986), males are highly "selective" in the information that they apprehend from the environment for subsequent processing. Consequently, they tend to impose limits on both the amount and content of information that is considered upon contact with a stimulus. Thus, rather than comprehensively processing all cues at their disposal, males consider only a subset of all available information. Furthermore, males also appear to resort to a number of heuristic devices that aid them in performing this selective, gate-keeping function. One heuristic device commonly employed by males is reliance on a singular piece of information. Instead of using multiple cues to piece together the elements of a stimulus and its surrounding context, only one focal cue is extracted from the environment and utilized in subsequent processing. Additional tactics employed by males include seeking out cues that coincide with well-entrenched memory structures or multiple cues that imply a conceptually singular theme (Meyers-Levy 1986).

In a manner opposite to males, the "Theory of Selectivity" (Meyers-Levy 1986) asserts that females exert a tremendous amount of effort in attempting to assimilate all available cues in their environments. Thus, although the demands of a task may exceed human processing resources (thereby preventing females from accomplishing such an objective) they are still thought to engage in a comprehensive, detailed analysis of all available information (Meyers-Levy 1986).

Linking Gender Differences in Processing to Cognitive Structure

Based on the results obtained by Meyers-Levy (1986), it is proposed by this research that gender differences in both the effort expended during processing as well as the number and type of informational cues *attended* to, will manifest itself in category structures that are constructed and organized differently from one another. Thus, the "Theory of Selectivity" becomes our theoretical base for conceptually bridging the gap between processes of *attention* and those related to information storage (i.e., category construction and organization), and ultimately, to proclivity to employ a particular information processing strategy. To illustrate, the "Theory of Selectivity" states that men tend to direct attention to a limited number of cues that provide a maximal amount of information. This permits them to impose structure on a vast amount of seemingly unrelated information by enabling them to quickly identify and extract elements of commonality. It appears intuitive, therefore, that the category structures responsible for guiding this type of processing should be constructed in a similar fashion. In other words, it is anticipated that the category structures of males are fairly broad-based and loosely defined. Thus, the parameters by which these categories are defined and how category membership is assessed are likely to be determined by a limited number of highly salient and important attributes.

In the opposite vein, the "Theory of Selectivity" states that females tend to direct attention to a wide assortment of environmental cues (Meyers-Levy 1986). Thus, it seems logical that information processing on the part of women should be guided by category structures that are narrowly defined according to a precise set of attribute standards. Consequently, a large category system divided along subtle lines of

distinction should be extremely beneficial in helping females to recognize and identify new stimulus situations.

Thus, in order to link gender differences in cognitive structure to differences in processing proclivity, our immediate research goal is to ascertain if men and women differ in the degree of latitude that they exhibit when defining categorical boundaries. However, unlike other researchers who have attempted to measure a category's endpoints, this research will delve further into the internal structure of categories by ascertaining the relative position of specified category members. Specifically, not all members associated with a particular category at a specified level of taxonomic abstraction are considered equal in their embodiment of category characteristics. Rather, most categories contain members that vary in perceived equivalency to those characteristics thought to define "ideal" (i.e., prototypical) category membership.

INTERNAL STRUCTURE OF CATEGORIES – TYPICALITY

Although one can conceive of category boundaries in terms of conditions that specify the necessary and sufficient criteria required for category membership, separateness of continuous categories can also be achieved by conceiving of categories in terms of their clear instances (Rosch 1978). According to Rosch (1978), "categories can be conceived as clear instances to the extent that a perceiver places emphasis on the correlational structure of perceived attributes such that categories are represented by their most structured portions." Thus, the term "prototype" has been used to refer to a clear or ideal instance of a category. Operationally, prototypes are defined based on person perception of a category member's "goodness of fit" to a specified category (i.e., typicality). The higher the typicality score, the more representative an item is perceived to be in relation to the category against which it is being judged.

Although different determinants of typicality have been identified (e.g., familiarity with an item, the degree to which an item shares attributes with other category members, etc.,) the attribute-sharing perspective is most applicable to the objectives of the present study. Based on a review of the literature, there are two separate models that relate attribute sharing to typicality. These include the "family resemblance" model developed by Rosch and Mervis (1975), and the "feature-similarity" approach developed by Tversky (1977). The family resemblance model simply states that typicality of an item is based on the attributes it shares in common with other category members. Thus, the more attributes an item has in common with other members, the more typical the product is regarded, and hence, the greater its family resemblance score. According to Rosch and Mervis (1975), "members of a category come to be viewed as prototypical of the category as a whole in proportion to the extent to which they bear a family resemblance (i.e., possess attributes in common) with other members of the category." Furthermore, an item possessing a high family resemblance score, (i.e., it shares most of its attributes with other category members), will also tend to have the fewest attributes in common with related contrast categories (Rosch and Mervis 1975). Family resemblance is deduced by enlisting subjects to enumerate attributes for a set of items belonging to a specified category. Upon completion, each item's family resemblance score is calculated by weighting its attributes by the number of items that share each attribute and then summing these weights. Through a series of experiments that evaluated the relationship between perceived typicality and family resemblance on items existing in one of three types of taxonomic categories (i.e., superordinate, basic-level, and subordinate categories), it was concluded that a strong, significant correlation between the two measures existed. Specially, results garnered from these studies indicated that the more an item had attributes in common with other category members, the more it was rated as

being a strong, highly representative member of the category (Rosch and Mervis 1975).

Building on the family resemblance model, the feature-similarity model devised by Tversky (1977) factors both common and distinctive attributes into an item's typicality rating. Specifically, in ascertaining the similarity between two items A and B, a function is computed whereby the features of A that are not shared by B, and the features of B that are not shared by A, are subtracted from the sum of A and B's common features (Tversky and Gati 1978). Thus, a positive relationship exists between perceived typicality and the extent to which an item shares attributes in common with other category members. However, unlike other attribute-sharing models, the feature-similarity approach also takes into account the distinctive attributes claimed by an item. Thus, under this approach, perceived typicality is negatively related to the distinctive attributes possessed by A and B.

Due to the diagnosticity of attribute information in product/service selection/consumption, each of these models will be used in conjunction with one another in order to ascertain if gender differences exist in perceptions of category member equivalence.

Gender Differences in Category Member Equivalence

Although substantial research has concluded that categories possess members that vary in degree of representativeness, the notion that category nonequivalence may be influenced by an individual difference variable (e.g., gender) has received little attention in the literature. Two notable exceptions include Poole (1982) and Pettigrew (1958). In a study conducted by Poole (1982), male and female subjects were provided with a battery of cognitive-style tests that were intended to tap items such as conceptual differentiation, categorizing flexibility, conceptual preference, divergent thinking processes, and equivalence ranges. Highly similar in meaning to the concept defined as typicality, "equivalence range" refers to the range of stimuli placed into a category per a fixed number of stimuli (Glixman 1965). Based on an assessment of discriminant weights, Poole (1982) concluded that males and females showed a number of cognitive-style differences with one of the most significant differences occurring in category estimation. Specifically, males were found to display broad estimates of category boundaries while females appeared to display more narrow estimates of category boundaries. Extending these findings to previous discussions on typicality, it can be argued that Poole's (1982) results seemingly indicate that males perceive more items as being representative of a particular category than females. Thus, it is anticipated that males will, on average, report higher typicality scores for a given set of stimuli than females.

Similar to the concept of equivalence range, "bandwidth" and "category width" are two other terms that have been used interchangeably in the literature. According to Pettigrew (1958), category width is conceived as a means of capturing a subject's "typical equivalence range" for classifying stimuli. According to this researcher, individuals appear to exhibit considerable consistency in the range or width of their cognitive categories. Thus, regardless of the category tapped, subjects can be classified as belonging to a group of broad, medium, or narrower categorizers. Broad categorizers, for example, will risk incorporating an object potentially considered to be an outlier into their category structures in order to include a maximum number of positive instances. Conversely, narrow categorizers are more likely to disregard positive instances of a category in order to minimize the number of negative instances (Pettigrew 1958). In frequent rounds of scale testing, Pettigrew (1958) discovered that gender of the respondent significantly influences the score received on the "category width" scale. Specifically, it is consistently found that males display broad category estimates while females display significantly narrower category estimates.

Studies similar to that conducted by Pettigrew (1958) provide corroboratory support for

gender differences on the cognitive dimension of category width. Meyers-Levy (1986), for example, references several studies that have attempted to measure this dimension by engaging subjects in various sorting tasks. In these studies, respondents are presented with a standard object (i.e., one perceived as being highly typical of the category in question) along with other stimuli that vary in similarity to the standard. Shapes and colors are some of the stimuli that have been used in these experiments (Block and Block 1973; Wallach and Caron 1959). In each of these studies, males consistently endeavored to group objects into broad, overarching categories while females tended to form much narrower item groupings.

In summary, each of the constructs referenced above (i.e., typicality, equivalence range, category width, and bandwidth) have attempted to tap the width (versus depth) dimension of category structure, albeit from slightly different angles. For example, studies measuring equivalence range, category width and bandwidth have tended to restrict their focus to the boundaries imposed on a category. Specifically, each of these measures has attempted to discern if there are male/female differences in the values bestowed on a category's endpoints. Typicality, on the other hand, has received far less attention with respect to potential variation by gender. Typicality can be distinguished from the other three constructs (i.e., equivalence range, category width and bandwidth) in that this measure focuses less on the boundary conditions associated with a category, and more on the dispersion of "perceived object similarity" within the confines of a specified category. Based on the importance of typicality to marketers, coupled with the lack of empirical testing that has been done on this measure, this construct will be explored further. Specifically, the mediating influence of gender on typicality judgments within a marketing context will be considered.

Differences on the Horizontal Category Dimension in a Marketing Context.

According to Loken and Ward (1990), the construct of typicality is important to marketers for several reasons. First, the extent to which consumers perceive a product as being more or less representative of a particular category has critical implications for how a product is positioned. For example, a high-energy, caramel-colored, carbonated beverage may be perceived by consumers as belonging to either the category of health/sports drink, or cola categories. Furthermore, if consumers proceed to categorize the drink as a cola, subsequent issues to be addressed include the choice of category members that the drink will be compared with, along with how typical the drink is perceived in relation to other "cola" category members. Additional issues of concern to marketers include the notion that perceptions of typicality linked to a product or brand are likely to influence the probability of a product or brand being included as a member of a consumer's evoked set as well as the likelihood that consumers will categorize and evaluate the product in the direction intended by the marketer (Loken and Ward 1990).

The theories that drive individuals' perceptions of object typicality (i.e., family resemblance and feature-similarity) were previously outlined. Extending this research, Loken and Ward (1990) attempt to validate these earlier models by evaluating the construct of typicality in product categories. Based on an earlier discussion, the model of family resemblance argues that the more typical an object is of its stated category, the more attributes it will share with other members, and hence, the greater its family resemblance (Mervis and Rosch 1981). Moving this model into the realm of product categories, Loken and Ward (1990) designed a study that enlisted subjects to complete a subset of measures of typicality and family resemblance for eight superordinate and eight subordinate product categories (each containing 15 members). For example, one of the superordinate category labels was listed as "types of restaurants." Within this

superordinate category, basic-level members included Japanese, Italian, Pizza, Fast-Food, etc. Similarly, a subordinate product category chosen for evaluation was "airliners." Within this category, members included Delta, United, Continental, etc. Upon assessment of subject responses, it was noted by these researchers that there existed a strong and significant correlation between family resemblance and typicality in product categories. Thus, it was concluded that perceptions of product/brand typicality were related to the possession of shared attributes (Loken and Ward 1990).

In a similar vein, the model of feature-similarity developed by Tversky (1977) was also considered. As previously explicated, this model argues that typicality is positively related to the number of shared attributes possessed by an object, but inversely related to the number of distinctive attributes two objects possess. Considering this model in the context of marketing, Loken and Ward (1990) make a strong argument for considering both distinctive as well as common product attributes in judgments of typicality. Specifically, these researchers argue that marketers often attempt to differentiate their products by touting those attributes *not* possessed by the competition. Thus, distinctive features may make a product appear both atypical and unique. Additionally, many marketers find it advantageous to urge consumers to consider both common and distinctive attributes prior to making a purchase decision (Loken and Ward 1990). Thus, upon assessment of subject responses, it was determined that common attributes were positively and significantly related to typicality in product categories. Additionally, distinctive attributes were identified as being negatively related to typicality in product categories, although this relationship was not found to be statistically significant.

One additional determinant of typicality considered by Loken and Ward (1990) is the degree to which a product or brand possesses salient attributes related to the goals or uses of the category. In other words, salient product attributes are defined as those that consumers perceive as being relevant to fulfilling the consumer-related goals promised by use of a category. According to these researchers, perceptions of product typicality are directly influenced by the extent to which a product possesses the requisite goal-relevant attributes (Barsalou 1985; Loken and Ward 1990). Furthermore, attribute salience is considered most instrumental in influencing typicality assessments of products evaluated at basic and subordinate categorical levels of abstraction.

Therefore, based on the findings presented above, coupled with earlier evidence that pointed to male/female differences on the "width" dimension of category structure, it is suggested by this research that perceptions of product typicality will likewise be mediated by the gender of the perceiver. Specifically, support for this supposition is based on the notion that males tend to perceive and organize information in a highly broad-based fashion. As previously indicated, males tend to define category membership based on broad, salient, over-arching characteristics. Consequently, it is believed that male category structures will tend to possess more members that are perceived as similar to one another based on the ability of members to meet the minimum criteria necessary to qualify for category membership. In other words, upon encountering a basic or subordinate-level category, it is anticipated that males will perceive more members as being prototypical of the category if they possess the minimum number of salient attributes required for category membership. Thus, it is suggested that males' typicality judgments of various products within a category will be closely aligned with one another (i.e., less dispersed). Additionally, it is also hypothesized that males will attend more to elements of commonality between category members than items of distinction in assessments of product typicality.

In the opposite vein, females have been shown to organize information along highly detailed lines of distinction. Thus, upon encountering a basic or subordinate-level category, it is

anticipated that for a given list of potential category members, females will perceive more members as being less prototypical of the category than males. In other words, because females are believed to possess category structures that are highly restrictive and less inclusive, judgments of typicality will be more dispersed within a given category (at a specified level of abstraction) than those exhibited by males. Consequently, it also hypothesized that females will attend to both elements of commonality and elements of distinction in assessments of product typicality. Thus, the following is suggested:

Hypothesis 1: Overall, males will report higher typicality scores than females.

Hypothesis 2: Overall, males will exhibit less dispersion in their typicality scores than females.

Hypothesis 3: Males' typicality scores, as compared with females' typicality scores, will be more positively related to the number of focal/salient attributes that two product category members share in common with one another.

Hypothesis 4: Females' typicality scores, as compared with males' typicality scores, will be more negatively related to the number of distinct attributes that are held by one member as compared to another.

METHOD

Subjects

Participants in this study consisted of 119 college students (57 males and 62 females) enrolled in undergraduate business courses at a large Midwestern university. Subjects participating in this study were given the opportunity to sign up for one of 35 experimental sessions that spanned the course of two consecutive weeks. Sessions were offered each day of the week and at multiple times during the day. A typical session averaged between four and six participants with roughly an equal number of males and females in each session.

Design

Adopting a procedure outlined by Loken and Ward (1990), male and female subjects were instructed to complete a subset of measures involving typicality, attitude, and family resemblance for five different subordinate-level product categories that were derived from a single basic-level category (i.e., restaurant chains). According to Loken and Ward (1990), the overall correlations between global attitude, typicality, and other measures tend to be higher in the subordinate product categories than in the superordinate product categories. Thus, in order to effectively capture the effects of gender, five different subordinate-level product categories (i.e., pizza chains, sandwich chains, family chains, chicken chains, and dinner house chains) were selected for inclusion into the present study. Specifically, stimuli consisted of seven different category members (i.e., brands) that were chosen for each of the five subordinate-level product categories referenced above.

Stimuli Selection - (Pretests)

The process of selecting experimental stimuli involved several different steps. One of the first considerations made with respect to stimuli selection was the superordinate product domain from which category members (i.e., brands) would ultimately be selected. The primary objective in locating a suitable domain was to identify one where males and females had approximately equivalent (above average) levels of knowledge and experience. Pretest results (based on a 7-point scale with 1= not at all knowledgeable/familiar to 7 = very knowledgeable/familiar) revealed that the restaurant chain product domain, versus various other domains (e.g., candy, hotels/motels, newspapers/magazines, television shows, computer software, etc.) possessed the smallest mean difference in knowledge/familiarity between males and females ($M_{males} = 4.83$ versus $M_{females} = 4.62$; $t(72) = 1.14$; p = n.s.).

Furthermore, this product domain also yielded fairly similar (and small) standard deviations within the male and female portions of this sample (SD_{males} = .766 versus $SD_{females}$ = .752).

In order to ascertain how the restaurant chain product domain was segregated, the June issue of *Nation's Restaurant News* (Liddle 2004) was consulted. In this issue, a study of the "Top 100 Restaurant Chains" was delineated. According to a definition provided by this publication, a chain is defined as the "brand name of the restaurants, hotels, contract foodservice systems, retail stores, or other entities in a multiunit organization, as identified by its signs, logotypes and trademarks" (Liddle 2004, p.3).

Based on the methodology employed by *Nation's Restaurant News* (Liddle 2004), restaurant chains were ranked according to a combination of factors including total sales, sales per unit, sales growth, market share, etc. More importantly, however, rankings for various chains were designated based on restaurant "concept." According to the authors of this publication, "concept" is defined as the "type of restaurant or foodservice operation run by the chain, as defined generically by its food type, service style, retail context, and operating format." Additionally, most restaurant chain "concepts" are considered self-defining and are typically categorized on the basis of the National Restaurant Association's (NRA) traditional parameters. Thus, in an effort to select the stimuli that would be used for the current study, five restaurant chain concepts (i.e., subordinate-level product categories), as defined by *Nation's Restaurant News* (Liddle, 2004), were extracted. These five categories included pizza chains, sandwich chains, family chains, chicken chains, and dinner house chains. Although all five categories are fairly self-explanatory, it should be noted that dinner house chains and family chains are defined as such, and distinguished from one another, on the basis of their generally dissimilar price point ranges, and by the fact that most dinner houses have full bar operations but do not serve breakfast, whereas most family chains do not have bars, but do serve breakfast.

Thus, upon identifying five subordinate-level categories within the restaurant chain product domain, the next step in selecting stimuli (i.e., category members) for this study entailed following a procedure similar to the one outlined by Loken and Ward (1987). Specifically, production norms were obtained by asking 75 pretest subjects (38 males and 37 females) to name between five and ten restaurant chains that they associated with each of the five subordinate-level category designations (i.e., pizza chains, sandwich chains, family chains, chicken chains, and dinner house chains). Next, a separate set of 62 pretest subjects (30 males and 32 females) were instructed to rate all brands listed in the production norms with respect to whether they were "familiar" or "not familiar" with the category member. All brands that received a score of 70 percent or better reporting "familiar" were rank-ordered by production norms (i.e., frequency of mention in the original production norm data). Finally, a systematic sampling of the remaining items was instituted in order to achieve a range of typicality. The culmination of this process was a list of seven category members (i.e., brands) for each of the five subordinate-level categories.

As an aside, additional testing was done to verify that the brands chosen for inclusion into this study shared a number of important attributes (as defined by the National Restaurant Association) with one another, but also differed on a host of other dimensions. Furthermore, a separate set of pretest subjects also confirmed that the genders did not significantly differ in their knowledge/ familiarity of the selected category exemplars.

Dependent Measures

Similar to the method employed by Loken and Ward (1990), global typicality was assessed via three different scales: exemplar goodness (10-point scale), typicality (5-point scale), and representativeness (10-point scale). Thus, a

single measure of global typicality was obtained by standardizing, summing, and averaging scores on all three measures (across individual respondents).

Furthermore, in order to assess the influence of common and distinct attributes utilized by males and females in judgments of typicality, procedures utilized to ascertain feature similarity (under the attribute-sharing perspective) were modified to fit the requirements of the present study (Rosch and Mervis 1975; Tversky 1977). Thus, for every pair of restaurant chain brands, the number of attributes that both possessed (i.e., the number of common attributes) was counted along with the number of attributes that were possessed by one brand but not by the other (i.e., the number of distinct attributes). As will be described shortly, correlation analyses were run on this data in order to ascertain if males and females accorded different weights to common versus distinct attribute information in their typicality assessments.

A final measure that was administered was an assessment of consumer knowledge/familiarity with the restaurant chain product domain and individual category exemplars. Subjective knowledge and familiarity of the restaurant chain product domain were assessed using the two-item scale employed by Johnson and Russo (1984).

RESULTS

In evaluating the typicality data statistically, a one-way multivariate analysis of variance (MANOVA) was conducted in which five measures of interest (i.e., overall typicality score pizza chain domain, overall typicality score sandwich chain domain, overall typicality score family chain domain, overall typicality score chicken chain domain, and overall typicality score dinner chain domain) were analyzed simultaneously as a function of gender. The analysis revealed a highly significant main effect of gender. Specifically, males and females perceived differences in brand typicality (Hotelling's $T^2 = 41.19$; $p < .001$) regardless of the product domain being evaluated. To further substantiate these results, supplementary analyses of each dependent variable were conducted. As expected, these univariate analyses support the MANOVA results presented above. Specifically, males and females produced different typicality scores in the pizza chain domain ($M_{males} = .852$ versus $M_{females} = .679$; $F = 145.85$; $p < .001$); in the sandwich chain domain ($M_{males} = .810$ versus $M_{females} = .665$; $F = 72.66$; $p < .01$); in the family chain domain ($M_{males} = .871$ versus $M_{females} = .722$; $F = 54.73$; $p < .001$); in the chicken chain domain ($M_{males} = .886$ versus $M_{females} = .671$; $F = 132.97$; $p < .001$); and in the dinner chain domain ($M_{males} = .869$ versus $M_{females} = .718$; $F = 83.95$; $p < .001$).

In addition to producing higher "overall" mean typicality scores, males also displayed *less* dispersion in their scores than females. This was true for the pizza chain domain ($SD_{males} = .067$ versus $SD_{females} = .087$); the sandwich chain domain ($SD_{males} = .087$ versus $SD_{females} = .097$); the family chain domain ($SD_{males} = .098$ versus $SD_{females} = .119$); the chicken chain domain ($SD_{males} = .065$ versus $SD_{females} = .125$); and the dinner chain domain ($SD_{males} = .069$ versus $SD_{females} = .104$). Thus, the implication of these results is that males tended to view more brands as being prototypical of their respective domains than female, (by virtue of higher "overall" mean scores), as well as more similar to one another (by virtue of less dispersion in their scores). Thus, based on this analysis, there exists preliminary evidence to suggest that males and females differ on the "width" dimension of category structure.

However, in addition to gender differences at the level of the product domain, it is also important to consider how males and females approached the typicality rating process. Specifically, a primary objective of this research was to gain an understanding of the informational content that males and females employed in assigning typicality scores. Thus, as previously explicated, five category members (i.e., brands) were selected from a product category that subsists at a subordinate

level of abstraction (i.e., dinner chain restaurants). The five restaurant chains chosen for inclusion into the present study were selected based on pretest results that revealed that these brands represented a range of typicality within the dinner chain product category. Furthermore, the diner chain domain was chosen over the other four product domains (e.g., pizza chain domain, chicken chain domain, etc.) because its members share a significant number of common attributes with one another but also differ on a host of other dimensions. The five category members selected include: TGI Friday's (TGI), Ground Round (GR), Chi-Chi's (CHI), Damon's (DAM) and Cooker's (COK).

Thus, in an attempt to ascertain if gender differences exist on the horizontal dimension of category structure, subjects were asked to list the attributes or characteristics that they thought "best" described each of the five brands. Based on this procedure, data analysis consisted of evaluating the typicality scores as well as the number of common, distinct, and total attributes that were extracted by subject for each pair of restaurants. Consequently, there were a total of ten stimulus pairs that were analyzed across individual subject. These included: (Pair #1 (TGI/GR), Pair #2 (TGI CHI), Pair #3 (TGI/DAM), Pair #4 (TGI/COK), Pair #5 (GR/CHI), Pair #6 (GR/DAM), Pair #7 (GR/COK), Pair #8 (CHI/DAM), Pair #9 (CHI/COK), and Pair #10 (DAM/COK). Based on this exercise, it was posited that males would identify a greater number of common attributes (per stimulus pair), than females. In the opposite vein, it was also argued that females would list a greater number of distinct attributes, (per stimulus pair) than males. As confirmed by data analysis, males were highly inclined to list a larger number of shared attributes, (per stimulus pair), than females ($M_{males} = 1.56$ versus $M_{females} = 0.48$; $t(105) = 11.23$; $p < .001$). On the other hand, females produced more distinct attributes (per stimulus pair) than males ($M_{females} = 7.13$ versus $M_{males} = 5.13$; $t(105) = 6.03$; $p < .001$).

Additionally, it was hypothesized that males' typicality scores, as compared with females' typicality scores, would be more positively related to the number of focal/salient attributes that two brand members share in common with one another. To test this hypothesis, the correlation coefficient obtained from relating the absolute difference score between typicality measures and the number of common attributes per stimulus pair was utilized. According to the above, it is expected that males will show stronger negative correlations than females indicating smaller differences between typicality scores and a strong relationship between typicality judgments and the number of common attributes listed per stimulus pair. As anticipated, data analysis revealed that in eight out of ten correlations, the number of common attributes listed per stimulus pair was more strongly related to males' judgments of typicality than it was to females' judgments of typicality (reference Table 1). In other words, not only did males supply a greater number of common attributes per stimulus pair than females, but there also appears to be a more significant relationship between the number of common attributes reported by males and their judgments of "perceived" brand similarity (i.e., typicality).

Finally, it was also hypothesized that females' typicality scores, as compared with males' typicality scores, would be more negatively related to the number of distinct attributes that are held by one member as compared to another. Justification for this hypothesis was based on the idea that females' cognitive structures are highly exclusive and tend to be organized along subtle lines of attribute distinctions. In the opposite vein, males are believed to possess cognitive structures that are highly inclusive and broadly defined. Thus, their category structures tend to be organized around a few, highly salient attributes that are held in common by most members belonging to a broad product category. Based on these gender variations in cognitive construction, it is posited that these differences will be reflected in the relationship between perceptions of brand similarity (i.e., typicality) and the number of

TABLE 1
Correlation Analysis Between Stimulus Pair Typicality Scores and Number of Common Attributes

MALE vs. FEMALE (n=119)

Stimulus Pairs	Typicality Scores (Absolute Difference) *Mean*	# Common Attributes *Mean*	Pearson's r	p-value
Pair #1 (TGI_1/GR_2)				
Males	1.18	1.85	-.337	.006**
Females	2.69	0.48	-.254	.025**
M vs. F (*abs. diff.*)	*(1.51)*	*(1.37)*	*(.083)*	
Pair #2 (TGI_1/CHI_2)				
Males	1.18	1.77	-.258	.026**
Females	2.05	0.74	-.150	.122
M vs. F (*abs. diff.*)	*(0.87)*	*(1.03)*	*(.108)*	
Pair #3 (TGI_1/DAM_2)				
Males	0.77	1.71	-.230	.044**
Females	1.79	0.72	-.228	.038**
M vs. F (*abs. diff.*)	*(1.02)*	*(0.99)*	*(.002)*	
Pair #4 (TGI_1/COK_2)				
Males	0.91	1.59	-.227	.050**
Females	2.13	0.73	-.228	.041**
M vs. F (*abs. diff.*)	*(1.22)*	*(0.86)*	*(.001)*	
Pair #5 (GR_1/CHI_2)				
Males	1.30	1.22	-.199	.072*
Females	2.16	0.27	-.180	.084*
M vs. F (*abs. diff.*)	*(0.86)*	*(0.95)*	*(.019)*	
Pair #6 (GR_1/DAM_2)				
Males	1.35	1.46	-.229	.048**
Females	2.74	0.44	-.224	.044**
M vs. F (*abs. diff.*)	*(1.39)*	*(1.02)*	*(.005)*	
Pair #7 (GR_1/COK_2)				
Males	1.35	1.63	-.265	.029**
Females	2.66	0.37	-.231	.042**
M vs. F (*abs. diff.*)	*(1.31)*	*(1.26)*	*(.034)*	
Pair #8 (CHI_1/DAM_2)				
Males	1.04	1.39	-.123	.183
Females	2.06	0.33	-.150	.125
M vs. F (*abs. diff.*)	*(1.02)*	*(1.06)*	*(.027)*	
Pair #9 (CHI_1/COK_2)				
Males	1.14	1.06	-.033	.407
Females	2.44	0.24	.024	.428
M vs. F (*abs. diff.*)	*(1.30)*	*(.820)*	*(.057)*	
Pair #10 (DAM_1/COK_2)				
Males	0.67	1.94	-.344	.006**
Females	2.69	.48	-.254	.085*
M vs. F (*abs. diff.*)	*(1.38)*	*(1.53)*	*(.161)*	

distinct attributes listed by men versus women. As anticipated, data analysis revealed that for each stimulus pair, the mean number of distinct attributes listed by females far exceeded that supplied by males. An independent sample t-test performed on the "number of distinct attributes/per stimulus pair" also supports this claim ($M_{males} = 5.13$ versus $M_{females} = 7.13$; $t(105) = 6.03$; $p < .001$). Additionally, the other piece of data used to test this hypothesis was the correlation coefficient obtained from relating the absolute difference score between typicality measures and the number of distinct attributes/per stimulus pair. Based on that presented above, it is expected that females will yield stronger, more positive correlations than males. This result would indicate that females took into consideration a larger number of distinct attributes in their brand typicality assignments. Thus, as expected, data analysis revealed that in nine out of ten correlations, the number of distinct attributes listed per stimulus pair was more strongly (and positively) related to females' absolute difference scores than it was to males' absolute difference scores (reference Table 2). Consequently, not only did females supply a greater number of distinct attributes per stimulus pair than males, but there also appears to be a more significant (negative) relationship between the number of distinct attributes reported by females, versus males, and their judgments of perceived brand similarity (i.e., typicality).

DISCUSSION AND IMPLICATIONS

To conclude, this study presents an initial attempt to investigate gender differences in cognitive structure composition. Specifically, empirical testing on the internal (i.e., "width") dimension of category structure provides some preliminary evidence to suggest that viable gender differences exist. As a result of this finding, there are likely to be significant marketing implications for how males and females build consideration sets and how decisions are made amongst product/brand alternatives during processes of choice. For example, by integrating the findings of the current study with the area of brand recall, it appears intuitive that males and females would yield very different consideration sets when confronted with an identical problem situation. Specifically, because females produce category member similarity assessments that are highly dispersed and based on subtle attribute distinctions, it is anticipated that they will evoke a very precise consideration set that is comprised of brands specifically geared toward solving the problem at hand. Conversely, because males possess less dispersed category structures that contain members who share a limited set of highly salient attributes, it is expected that their consideration sets will contain a number of very disparate brands. Thus, males' consideration sets may be relatively inferior to that produced by females with respect to solving a very specific problem.

Perhaps one of the most significant implications of these research findings concerns the manner in which marketers position their products or brands in the marketplace. As defined by Perreault and McCarthy (1999), positioning refers to consumers' perceptions of a specific product/brand relative to other "similar" product/brands in the marketplace. Thus, product-positioning strategies require a realistic conception of how consumers view various brands in the marketplace as well as how the marketing manager desires target consumers to think of his/her brand. Product positioning strategies become increasingly important in environments characterized as "monopolistic" where there are many brands in the marketplace that consumers perceive as being close substitutes for one another. Consequently, in such a market environment, it becomes imperative that the marketing manager differentiate his/her brand in the minds of target consumers. This entails an intimate understanding of the dimensions/attributes that are important to consumers so that a marketing mix (perceived as need-satisfying in ways that are both different and better than that offered by the competition) can be designed.

Thus, with respect to the current research study, several important points are made. First, based on gender differences in cognitive makeup, the

TABLE 2
Correlation Analysis Between Stimulus Pair Typicality Scores and Number of Distinct Attributes
MALE vs. FEMALE (n=119)

Stimulus Pairs	Typicality Scores (Absolute Difference) ***Mean***	# Distinct Attributes ***Mean***	Pearson's r	p-value
Pair #1 (TGI_1/GR_2)				
Males	1.18	4.76	.007	.480
Females	2.69	7.43	.240	.033**
M vs. F (*abs. diff.*)	*(1.51)*	*(2.67)*	*(.233)*	
Pair #2 (TGI_1/CHI_2)				
Males	1.18	5.14	.001	.497
Females	2.05	7.37	.168	.096*
M vs. F (*abs. diff.*)	*(0.87)*	*(2.23)*	*(.167)*	
Pair #3 (TGI_1/DAM_2)				
Males	0.77	5.07	.019	.212
Females	1.79	6.84	.236	.033**
M vs. F (*abs. diff.*)	*(1.02)*	*(1.77)*	*(.217)*	
Pair #4 (TGI_1/COK_2)				
Males	0.91	4.78	.159	.125
Females	2.13	6.51	.296	.011**
M vs. F (*abs. diff.*)	*(1.22)*	*(1.73)*	*(.137)*	
Pair #5 (GR_1/CHI_2)				
Males	1.30	5.36	.067	.314
Females	2.16	6.30	.278	.016**
M vs. F (*abs. diff.*)	*(0.86)*	*(0.94)*	*(.211)*	
Pair #6 (GR_1/DAM_2)				
Males	1.35	5.52	.151	.138
Females	2.74	7.25	.200	.064*
M vs. F (*abs. diff.*)	*(1.39)*	*(1.73)*	*(.049)*	
Pair #7 (GR_1/COK_2)				
Males	1.35	4.71	.046	.373
Females	2.66	7.07	.066	.314
M vs. F (*abs. diff.*)	*(1.31)*	*(2.36)*	*(.020)*	
Pair #8 (CHI_1/DAM_2)				
Males	1.04	5.38	.083	.272
Females	2.06	7.75	.136	.148
M vs. F (*abs. diff.*)	*(1.02)*	*(2.37)*	*(.053)*	
Pair #9 (CHI_1/COK_2)				
Males	1.14	5.37	-.175	.102
Females	2.44	7.20	.184	.081*
M vs. F (*abs. diff.*)	*(1.30)*	*(.820)*	*(.057)*	
Pair #10 (DAM_1/COK_2)				
Males	0.67	4.66	.259	.303
Females	2.05	7.55	.239	.035**
M vs. F (*abs. diff.*)	*(1.38)*	*(2.89)*	*(.020)*	

manner in which males and females conceive of various products in the marketplace is apt to be quite different from one another. Specifically, because males are inclined to aggregate products/brands based on a few, key, category-defining characteristics, they are likely to lump numerous (potentially disparate) brands under a single category label. As a result, all marketing efforts may be lost if a brand is perceived by a male as being virtually substitutable for another brand. Thus, one way marketers can circumvent such an occurrence is by identifying those category-defining dimensions that are most important and salient to target male consumers. Once these key characteristics have been identified, marked differentiation on one or more of these dimensions should be endeavored. Furthermore, this differentiation should be blatant to the degree to which it permeates all facets of marketing planning strategy. Consequently, by adopting this procedure, it is anticipated that males would be more apt to conceive of the brand as different from other offerings in the marketplace.

In the opposite vein, it has been demonstrated that women are inclined to aggregate brands according to subtle attribute distinctions. Consequently, it is expected that females would take note of subtle nuances between brands and categorize them accordingly. Thus, marketing initiatives aimed at differentiation along several dimensions of the marketing mix could prove to be highly beneficial. In other words, an effective differentiation strategy should yield a brand that females do not perceive as having a significant number of direct competitors. The end result of such a strategy is a brand that females perceive as belonging to a "class unto itself." Thus, marketing efforts directed at females should not only focus on elements of differentiation, but also on how the differentiated dimensions deliver superior customer value with respect to the need-satisfying benefits they provide. If marketers do not attempt to elaborate on how the differentiated dimensions provide value, females may not even consider the subcategory that the brand resides in during processes of decision-making.

STUDY LIMITATIONS

As with any similar research undertaking, limitations may compromise the generalizability of the study's results. Thus, with respect to the present study, the "restaurant chain" product domain was selected on the basis that males and females possessed equivalent (moderate to high) levels of knowledge about this superordinate product category. Furthermore, in addition to similar bases of knowledge, men and women also indicated that they were equally familiar with numerous brands in this product domain. In the "real world," however, there are probably very few product categories that would yield approximately equivalent levels of knowledge and familiarity between males and females. Furthermore, many product categories are likely to produce a significant amount of variation on these variables within male and female target populations.

FUTURE RESEARCH

In conclusion, although numerous researchers have studied physical differences in the male and female brains as well as gender differences in information processing, little attention has been directed to connecting these two lines of scientific inquiry. As a result, the contribution of this research is the development of a rudimentary framework that attempts to link gender differences in processing to differences in the creation and utilization of knowledge structures. Future research efforts should endeavor to tap the measurement of categorical structures using both different properties of category construction as well as different methodologies. For example, in addition to category width, the depth dimension of category construction should also be investigated and measured. Furthermore, considerable insight might be gained by explicitly linking gender differences in categorical structure to differences in the proclivity to employ a particular processing strategy.

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