

# Exploring the Origins and Information Processing Differences Between Men and Women: Implications for Advertisers

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## EXECUTIVE SUMMARY

Gender<sup>1</sup> has been and continues to be one of the most common forms of segmentation used by marketers in general and advertisers in particular. To successfully implement such a segmentation strategy marketers and advertisers need to understand how men and women process marketing information, judge products, and behave in the marketplace. The purpose of this article is to explore the origins of the observed gender differences, provide a critical review of the literature on the information processing differences between males and females, and discuss the major implications of such gender differences for advertising message design.

## THE ORIGINS OF BEHAVIORAL AND INFORMATION PROCESSING DIFFERENCES

### Biological Explanations

Sex differences are often attributed to the biological differences such as sex chromosomes, sex hormones, emotional make-up and brain lateralization. A large body of clinical, experimental, and observational research suggests that some of the differences observed between the sexes can be attributed to biological factors. However, the small size of the sex differences based on purely biological origins suggests that biology tells only part of the story.

### Social Explanations

Within the socialization literature, the concept of sex-role identification is central and is considered to be a major factor in the development of gender differences. According to this school of thought, children first identify with a particular gender (usually their own) and then seek to validate this identification by matching their personal attributes with the standards of behavior, motivations, and feelings that they perceive to be appropriate to the gender. The Social Role Theory suggests that the male-female differences in aptitude and personality traits often reflect traditional gender roles in society. This line of reasoning suggests that males are largely guided by controlling tendencies referred to as agentic goals that stress assertiveness, self-efficacy, and mastery. Males tend to vigorously pursue such self-focused goals having great personal consequences. Females are guided by communal concerns emphasizing interpersonal affiliation and harmonious relationships. Thus, the female sex role entails sensitivity to the concerns of both self and others. There is significant empirical evidence to support this view. Hence, both biology and socialization seem to contribute to the differences commonly observed between males and females and these differences influence how marketing communications are processed and evaluated by the two genders.

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<sup>1</sup> The American Psychological Association Publication Manual (4<sup>th</sup> Edition, 1994) states that *sex* is biological and *gender* is cultural. In line with this classification, I use the term *sex* when referring to purely biological factors. In all other cases, I use the term *gender*. Thus, in this article, I use the term *gender* in a somewhat broader sense than the term *sex*.

## **EXPLAINING THE OBSERVED GENDER DIFFERENCES USING INFORMATION PROCESSING DICHOTOMIES**

### **Selectivity Interpretation**

The Selectivity Hypothesis theorizes that gender differences in information processing emerge because, under certain conditions, men are more likely to be driven by overall message themes and women are more likely to engage in detailed elaboration of messages. Specifically, men are 'selective processors' who often rely on a subset of highly available and salient cues in place of detailed message elaboration. Women are 'comprehensive processors' who attempt to assimilate all available information before rendering judgment. This model also suggests that women have a lower threshold for elaborative processing than men. While the model enjoys some empirical support, some of its predictions have not been borne out in recent research suggesting that there might be an alternative explanation for the observed gender differences.

### **Item-Specific versus Relational Processing: An Alternative Explanation**

Research in the area of cognitive psychology suggests that there are two types of elaboration that facilitate comprehension in alternative ways. One type of elaboration, relational processing, emphasizes similarities or shared themes among disparate pieces of information. The second type of elaboration, item-specific processing, stresses attributes that are unique or distinctive to a particular message. Most of the observed gender differences such as male superiority in spatial skills and female superiority in verbal skills; male use of self-generated information and female use of self- as well as other-generated information; male focus on few salient attributes and female focus on intricate interrelationships etc. can be explained by such a processing dichotomy.

## **IMPLICATIONS FOR ADVERTISERS**

Several broad advertising implications follow from the observed gender differences. The specialized hemispheric processing by males suggests that they might benefit from nonverbal reinforcement (e.g., pictures, music etc.) of the verbal product information contained in an advertisement. On the other hand, the more integrated and symmetrical processing by females suggests that verbally descriptive messages might be more useful for such an audience. The rather strongly held gender identities suggest that appropriately targeted gendered advertisements might be quite effective, especially in cultures where there is a strong gender role prescription. While the use of gendered ads is highly recommended, how such messages should be executed depends on whether future empirical research supports the Selectivity Hypothesis or the Item-Specific versus Relational dichotomy. The Selectivity Hypothesis suggests that ads directed at men should be simple and focus on a single theme and ads directed at women should contain a lot of product information. The Item-specific versus Relational Processing dichotomy suggests that men as item-specific processors would value attribute-based messages and women as relational processors would favor category-based messages

## **EXPLORING THE ORIGINS AND INFORMATION PROCESSING DIFFERENCES BETWEEN MEN AND WOMEN: IMPLICATIONS FOR ADVERTISERS**

*"Nike's executives have come up with strategies they hope will take advantage of the differences between how women and men conceive of sport, how they shop for clothing and shoes and what they think of celebrity athletes."*

*-- Edward Wong, New York Times, June 2001*

Gender is frequently used to as a basis for segmentation for a significant proportion of products and services. Such segmentation, especially if it is based on biological sex per se, meets several of the requirements for successful implementation: easy to identify, easy to access, and large enough to be profitable. This practice seems consistent with the ascribing of specific personality traits to men and women and the observation that the unique interests and knowledge associated with the genders' social roles guide their respective judgments. For example, compared to men, women seem to do better at decoding nonverbal cues (Hall 1984; Everhart et al. 2001). Also, men and women seem to give different weights to the salient attributes (Fischer and Arnold 1994; Holbrook 1986) and information sources (Meyers-Levy 1988) while evaluating products. Some of the gender differences reported in the literature are no doubt due to the differences in product-class interest and knowledge exhibited by male and female respondents. However, recent gender research suggests that several of the differences cannot be explained in terms of unique interest or knowledge and are better explained in terms of information processing differences between men and women (Meyers-Levy and Maheswaran 1991; Meyers-Levy and Sternthal 1991).

Gender researchers have attributed these differences to a variety of social and biological factors. One of the oldest stereotypes of women is their interpersonal sensitivity: women are assigned to the socio-emotional domain of activity as compared to the task or instrumental domain associated with men. Early as well as recent empirical research seems to lend support to this claim. Research based on self-report measures shows that women exceed men on a cluster of traits variously called socio-emotional, expressive, and interpersonally oriented, whereas men exceed women on a cluster called task oriented, instrumental, and agentic (Costa, Terracciano, and McCrae 2001; Taylor and Hall 1982). Also, the ancient concept of women's intuition could actually be based in part on women's greater accuracy at decoding nonverbal cues or their tendency to reach quicker interpretations of nonverbal cues than men (Kirouac and Dore 1983). Men and women are likely to have differential communication and interaction with various social agents (Moschis 1985), and they often occupy different social roles and are subjected to different social pressures: men traditionally assume more dominant roles and women assume relatively submissive and subordinate roles. Thus, another possible source of greater interpersonal sensitivity in women is their disadvantaged status in most societies. People who are oppressed have heightened needs and therefore motives to understand subtle interpersonal cues. Such knowledge might aid their efforts at social adaptation (Eagly 1987; Hall 1984).

Gender differences could also be biological in origin, selected over the course of evolution because they offer certain advantages. Specifically, evolutionary psychology predicts that the sexes will differ in domains in which they have faced differing adaptive problems during evolution (Buss 1995). For example, for biological reasons, including pregnancy, childbirth, and lactation, women have larger investments in children. Women who are more agreeable and nurturing may have promoted the survival of their offspring and gained an evolutionary advantage. Women's greater sensitivity to nonverbal cues could be useful to them in child rearing (Hall 1984). Biological sex differences seem to exist in hemispheric lateralization, the degree to which one hemisphere is relatively dominant for various kinds of processing, wherein male brains are more functionally lateralized and female brains are more integrated (Everhart et al. 2001; Saucier and Elias 2001). Men exhibit superior spatial abilities and women excel in verbal and linguistic skills (Geary 1996; Hyde and Linn 1988). Research suggests that sexual hormones are connected with differences in perceptual-motor skills observed in men and women (Berenbaum 1999).

The fact that men and women are different is commonly accepted in most societies. However, the relevant research question is whether biological make-up or social factors drive these gender differences. A related question facing consumer researchers is whether such gender differences translate into consistent differences in information processing

and judgment. In order to deliver products and services that cater to the unique needs and aspirations of each gender, marketers need to understand the origins and psychological make-up of the two sexes. To this end, this article reviews the literature on the biological and social origins of sex differences; describes and critiques the current theories regarding how these sex differences translate into differences in information processing and judgment; and concludes with a discussion of the advertising implications of such differences.

## THE ORIGINS OF BEHAVIORAL AND INFORMATION PROCESSING DIFFERENCES

### Biological Explanations

One common explanation for the origin of gender differences is attributed to sex chromosomes and hormones, especially testosterone. Early clinical research reported by Money and Ehrhardt (1972) seems to refute this claim somewhat. They found that women exposed to prenatal androgens were more physically active but were not particularly inclined toward physical aggression or fighting. In a similar vein, infants lacking the second chromosome (these individuals have only one sex chromosome, an X, the second X or Y chromosome having been lost) were as feminine in their behavior and interest patterns as the control group of normal women despite the fact that they lacked ovaries and the second X chromosome. In some cases children born as genetic males and thus exposed to prenatal androgens had to be reassigned as women for medical reasons. These clinical studies show that a female gender identity was successfully developed in such cases of sex reassignment. Such data suggest that one's gender identity is not preordained by one's sex chromosomes or by one's prenatal hormonal history. While such hormones do have lasting effects such as higher physical activity, gender-role identity seems to be influenced by sex rearing, i.e., sex label and attendant interaction provided by parents and family. It should be noted, however, that these clinical results have limited generalizability since they are based on very small and somewhat unusual samples.

Despite such early clinical evidence to the contrary, recent studies suggest that hormonal differences between the sexes lead to differences in mood and personality – specifically, sex differences in androgens during early development affect interests, activities, and aggression (Berenbaum 1999). In addition, the notion that men are more aggressive than women has been consistently supported in empirical research across multiple settings, measurement instruments, and age groups (Costa, Terracciano, and McCrae 2001; Maccoby and Jacklin 1974). Furthermore, the fact that these differences emerge quite early in life and are found cross-culturally suggests that biological factors may be involved (Costa, Terracciano, and McCrae 2001; Maccoby and Jacklin 1974). However, aggression is usually conceptualized in terms of overt, physical behavior, such as hitting. Aggression could also involve non-overt behavior such as rejecting or ignoring another person who is trying to be friendly. Studies of female- and male-group reactions to a newcomer found that girls exhibited more indirect aggression than boys (Feshbach and Sones 1971), women were found to be as aggressive as men when the privacy of their aggressive act was assured (Mallick and McCandless 1966), and girls engaged in higher levels of relational aggression (i.e., verbal taunts, negative gossip, etc.) than boys (Crick and Grotpeter 1995). In sum, there is support for the hypothesis that men behave more aggressively than women at all ages but research also suggests that these gender differences in overt aggression may be due to the masculine sex-typing of aggressive responses. Women seem to recognize that aggressive behavior is culturally defined as unfeminine, and thus they tend to exhibit such responses only in a private, permissive situation, or in an indirect way.

Biological make-up is also considered to be responsible for women being more dependent and emotional than men. Contrary to stereotypic conceptions, women were not found to be more dependent than men. Of forty-eight independent observations of children's touching and proximity to parents, and resistance to separation from a parent, eight found girls more dependent, seven found boys more dependent, and the rest showed no differences (Maccoby and Jacklin 1974). Some researchers also report that sex differences in emotion are context dependent (Kelly and Houston-Comeaux 1999) i.e., women are more emotional in an interpersonal context and men are more emotional in an achievement context. However, researchers studying personality traits have consistently found that women score higher on 'Need for Affiliation' than men (Schultheiss 2001). Standard paper-and-pencil psychological tests consistently indicate that women are more anxious, moody, and fearful than men (Costa, Terracciano, and McCrae 2001; Osborne 2001). It should be noted that the cultural expectations that 'boys do not cry' and 'real men are not afraid' might make men less willing to report

anxieties and fears. Such tests might also be somewhat gender-biased since they contain few items dealing with anxieties relevant to men such as career or financial issues.

Brain lateralization is another commonly advanced theory to account for the differences between the sexes. The human brain is divided into two hemispheres and lateralization refers to the specialization in the functioning of each hemisphere: the left hemisphere specializes in verbal abilities and the right hemisphere specializes in spatial perception (Sperry and Levy 1970). At some point in development, lateralization begins and one hemisphere, usually the left, becomes dominant in its control of an individual's behavior. It has been argued that the timing of this lateralization may affect the development of both spatial and verbal skills. Since the most consistent sex differences in cognitive functioning are found on tasks involving either spatial or verbal skills (Geary 1996; Hyde and Linn 1988), it has been suggested that differential timing of lateralization might underlie, to some extent, these differences between men and women. Developmental studies suggest that lateralization begins earlier in girls thus giving them an advantage in the verbal domain while boys show superior spatial skills due to delayed lateralization (Knox and Kimura 1970). Also, female' hemispheres appear to be more symmetrically organized while men appear to show larger differences in hemispheric specialization (Saucier and Elias 2001), suggesting that two hemispheres are more specialized in men than women.

The empirical evidence relating to sex differences in intellectual abilities (specifically, spatial and verbal skills) is considered next. The common stereotype is that women are superior to men in all types of verbal skills. However, differences favoring women are not as strong and persistent as is usually thought, especially after early childhood. Reviews of sex differences in verbal skills suggest that girls outperform boys in speaking ability, reading, spelling, grammar, and vocabulary in early school years but the differences decline over time (Sherman 1971). In addition, for a few types of verbal skills such as verbal reasoning and communication skills there is no evidence of difference at any age (Higgins 1976). Hyde and Linn (1988) conducted a meta-analysis of 165 studies of sex differences in verbal ability and found a small difference that favored girls aged 5-18 years. Early research on memory shows a slight female superiority on some memory tasks (Maccoby and Jacklin 1974) and more recent research seems to confirm this finding i.e., women exhibit a modest memory advantage for both visual and verbal stimuli (Edens and McCormick 2000). In terms of math and spatial skills, men have been found to consistently outperform women (Maccoby and Jacklin 1974; Geary 1996). As with many traits and abilities, there seems to be a developmental trend for these sex differences, the differences do not appear in young children but grow during high-school years, suggesting that brain lateralization might account for this result. However, some researchers have attributed sex differences in math and spatial skills to gender-role related interests and practice. For example, boys more than girls are allowed to explore and manipulate their environment and/or encouraged to play with materials, such as mechanical toys, that develop spatial skills. Also, researchers have reported that sex differences did not emerge for subjects who indicated similar preferences – girls who said they would prefer to be boys did as well as boys on the spatial tasks (Nash 1975). However, recent studies have shown that spatial skills can be improved with practice but that the sex difference (i.e., male superiority) is not eliminated with increased experience (Lawton and Morrin 1999). In a recent review Halpern (1997) concluded that girls outperform boys on tests of verbal fluency, foreign language, fine-motor skills, speech articulation, reading and writing, and simple math calculation. Boys, on the other hand, do better on tasks such as mental rotation, mechanical reasoning, math and science knowledge, verbal analogies, and math calculation. Therefore, there seem to be consistent albeit small sex differences in cognitive abilities based on biological make-up.

In sum, there is enough evidence to suggest a biological basis for the behavioral and information processing sex differences found in children as well as adults. However, the size of the sex differences based on purely biological origins is quite small (e.g., Hyde and Lynn 1988; Osborne 2001) suggesting that biology tells only part of the story.

### **Social Explanations**

Within the socialization literature, the concept of gender-role identification is central and is considered to be a major factor in the development of behavioral differences. According to this school of thought, children first identify with a particular gender (usually their own) and then seek to validate this identification by matching their personal attributes with the standards of behavior, motivations, and feelings that they perceive to be appropriate to the gender. The stronger such identification, the more sustained the effort to make self-attributes congruent with perceived gender-role standards. Social behavior and patterns of cognitive ability are expected to be equally affected (Nash 1975).

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Scholars in the sixties and seventies theorized that men were achievement-oriented and women were affiliation-oriented (McClelland 1975) and that men pursued agentic goals and women pursued communal goals (Bakan 1966; Bem 1974). Achievement orientation involves the drive to accomplish external goals, to achieve success, and being assertive, independent, and self-centered. Affiliation orientation involves concern for other people's feelings, seeking approval from others, creating nurturing relationships with others, and maintaining interpersonal harmony (McClelland 1975). Using a similar but more comprehensive classification, Bakan (1966) argues that men are more agentic and women are more communal. Agentic orientation is expressed in such traits as being aggressive, achievement-oriented, and self-centered; communal orientation is expressed in being other-oriented, concerned with social acceptability, and being altero-centrist. For example, men are considered ego-centrist since they often make their pleasures and values the center of the world they live in. In contrast, women are considered altero-centrist because they center their feelings, enjoyment, and ambitions on something outside themselves (Bakan 1966). Therefore, women's judgments are considered to be more field dependent while men's judgments are considered to be more field independent. This hypothesis has been consistently supported; in social situations, compared to men, judgments of women were more variable (Witkin 1979), women were more open to persuasion (Eagly and Carli 1981), and women were more likely to use other-generated information in rendering judgments (Meyers-Levy 1988). McClelland et al. (1976) report that women were not influenced by references to leadership and intelligence but their achievement motivation increased when there was a threat of social rejection. In contrast, men were not influenced by social rejection but responded with increased achievement motivation when the scenario involved leadership and intelligence. They argue that these findings are in line with women wanting to 'get along with others' and men wanting to 'get ahead'.

Some scholars suggest that male-female differences in aptitude and personality traits often reflect traditional gender roles in society. Social Role Theory (Eagly 1987) suggests that the division of labor between the sexes creates gender-role expectations, which then lead to differences in social behavior and personality. According to this theory men and women possess attributes suited for the roles that they typically occupy. Men are more assertive and aggressive because historically they have been more likely to assume positions of leadership. Women, on the other hand, have not played these roles and thus do not develop these characteristics. For example, child rearing and domestic work has been largely the responsibility of women and there is also a tendency for women and men to carry out different types of paid employment in a sex-segregated economy. The communal content of the female gender role is derived from the domestic role and from occupational roles filled disproportionately by women (e.g., nurse, teacher, secretary). Similarly, the agentic content of the male gender role is assumed to derive from men's typical roles in society. Researchers have found that women and men whose talents and interests do not closely match the cultural stereotypes are likely to experience a high degree of frustration and low self-esteem. In a culture with highly articulated prescriptions for appropriate gender-role behavior, the most well-adjusted individuals are likely to be those with a high degree of identification with the appropriate gender role and with a strong aptitude in the areas of endeavor considered suitable for their gender. Less adequate adjustment is expected in individuals for whom these factors do not match (Keyes 1983).

A variation of the above Social Role Theory is a classification proposed by Bem (1974) suggesting that depending on the social situation, and regardless of biological sex, individuals might have differing levels of masculinity and femininity. The relative values on the dimensions of masculinity and femininity guide perception and behavior. Consistent with this theory, researchers have reported a positive relationship between self-perceived masculinity and the masculine advertising image of the cigarettes they smoked (Fry 1971). In addition, subjects classified as masculine on the basis of self-ratings made more frequent use of products and engaged more frequently in activities that were perceived as masculine, independent of the actual biological sex. On the other hand, subjects classified as feminine reported a preference for more feminine products and activities, regardless of actual sex of the respondent (Gentry, Doering, and O'Brien 1978). More recently, researchers have found that regardless of the traditional image of the described product, and regardless of the actual sex of the perceiver, consumers prefer products described in terms that matched the gender attributes that they perceived as both characteristic of and important to themselves (Worth, Smith, and Mackie 1992). Men for whom masculinity was a central and important aspect of their self-concept rated a product advertised with masculine language more positively than one advertised in a feminine way. Men whose self-image was not particularly masculine liked the product described in feminine terms better than the product depicted in masculine terms, even though the product was masculine (i.e., beer). Describing a gender-neutral product (i.e., blue jeans) in feminine terms increased its appeal to

highly feminine women and decreased its appeal to women who saw themselves as less feminine. The less feminine women preferred the product when it was described in masculine terms and rejected it when it was depicted in a feminine way (Worth, Smith, and Mackie 1992).

Manifestations of the above gender-based psychological differences can be seen in several areas. Male superiority in math performance is considered to be due to their preference for retrieval, a strategy that leads to speedier calculations and allows boys to devote more cognitive resources toward higher problem solving. Recent research confirms that boys prefer to use a retrieval strategy and girls prefer to use a manipulative strategy when solving basic addition and subtraction problems (Carr and Davis 2001). Male superiority in stereotypically male activities such as math and female superiority in stereotypically female activities such as writing seem to decrease or disappear when gender-orientation is controlled (Pajares and Valiante 2001), suggesting that these observed differences are not purely based on biological sex but may be a function of gender orientation. Female speakers are rated more highly on aesthetic quality while male speakers are rated more highly on dynamism (Mulac and Lundell 1982), and women have a more extensive color vocabulary than men (Nowaczyk 1982). Men tend to score higher on most aggression tests and women tend to score higher on most aspects of interpersonal relationships (Costa, Terracciano, and McCrae 2001). Men and women also differ in how they view relationships between themselves and others. Women are more likely to see and give equal importance to both sides of an interdependent relationship while men are more likely to structure social relationships in a hierarchy. Men are more likely to perceive threat from situations of affiliation for fear of entrapment and women are more likely to perceive relationships as protection from the danger of isolation (Pollack and Gilligan 1982). Also, men have a preference for advertising scenarios that promote competition whereby they can display their dominance (Prakash 1992). Men seem to be more persuaded by messages that contain agentic sentiments than those that do not, while women seem to be better persuaded with messages containing communal elements. Also, men seemed to favor self-generated information while women seemed to value both self-generated and other-generated information when rendering judgment (Meyers-Levy 1988). Therefore, the alternative gender roles played by men and women seem to influence how they process information presented in marketing communications.

A second variation of the Social Role Theory is the Socialization Model (Moschis 1985), which suggests that men and women learn primarily through communication with, and exposure to, various socialization agents such as parents, peers, and the mass media. These socialization agents stimulate interest in particular issues/products and serve as sources for how to obtain and process information. Since men and women are likely to have differential communication and interaction with the three socialization agents (i.e., parents, peers, and mass media), the two genders are likely to differ in their tendencies to use product labels and information. To the extent that women are socialized into feminine roles (stressing nurturance and relationship harmony), women are likely to have greater exposure to valuable marketplace-related communication from social agents. Such communication is consistent with the importance placed on relationships under the feminine role. In contrast, to the extent that men are socialized into masculine roles (stressing assertiveness and independence), they are likely to have less exposure to marketplace-related communications from social others and even if such information were available they might discount its value due to the male preference for self-generated information.

Therefore, the social psychology literature suggests that men and women think and behave differently due to the alternative roles they play in society. To some extent these differences are moderated by the individual's level of gender perception/identification and direct interaction with relevant social agents. By and large, Social Role Theory suggests that women and men seek to accommodate sex-typical roles by acquiring the specific skills and resources linked to successful role performance and by adapting their social behavior to role requirements. The psychological attributes and social behaviors associated with these roles translate into the frequently observed communal and agentic characteristics (Eagly 1987). In sum, there is sufficient evidence to suggest that both biology and socialization contribute to the differences commonly observed between the sexes and that these differences influence how marketing communications are processed and evaluated.

## EXPLAINING THE OBSERVED GENDER DIFFERENCES USING INFORMATION PROCESSING DICHOTOMIES

From an advertising perspective it is most fruitful to focus on those gender differences in information processing and judgment that have been consistently supported in past research: Women seem more accurate in decoding nonverbal cues (Hall 1984; Everhart et al. 2001) and are considered to be more visually oriented, more intrinsically motivated, and more romantic compared to men (Holbrook 1986). Male readers are more likely to be detached and tend to see a story from the outside (Bleich 1988), whereas female readers are more likely to be participatory and tend to experience a story from the inside (Flynn 1988). Similarly, compared to men, women have been found to show greater sensitivity to a variety of situation-specific cues in determining their self-evaluations (Lenney, Gold, and Browning 1983), use more elaborate descriptive terms (Nowaczyk 1982), and be subject to outside influences to conform (Meyers-Levy 1988). Men, due to their frequent conceptualization of items in terms of physical attributes and objective states, have been portrayed as more analytical and logical in their processing orientation. In contrast, women have been characterized as more subjective and intuitive since they indulge in more associative, imagery-laced interpretations (Haas 1979). The above body of evidence seems to suggest that men might respond more favorably to objective advertising claims and women might favor subjective, image-oriented messages. However, recently researchers have proposed an alternative explanation to account for these findings.

### Selectivity Interpretation

According to the Selectivity Hypothesis proposed by Meyers-Levy and her colleagues (Meyers-Levy 1989; Meyers-Levy and Maheswaran 1991; Meyers-Levy and Sternthal 1991), gender differences emerge because, under certain conditions, men are more likely to be driven by overall message themes or schemas and women are more likely to engage in detailed elaboration of message content. Specifically, men are considered to be 'selective processors' who often do not engage in comprehensive processing of all available information before rendering judgment. Instead, they seem to rely on various heuristics in place of detailed message elaboration. These heuristics involve a cue or cues that are highly available and salient and convergently imply a particular inference. Such processing implies that men will often base their judgment on a select subset of all available information. Women, on the other hand, are considered to be 'comprehensive processors' who attempt to assimilate all available information before rendering judgment. Women usually attempt effortful elaboration of all available information unless they are restricted by memory constraints. Therefore, women give equal weight to self-generated and other-generated information, encode more message claims, and elaborate on specific claims more extensively.

The Selectivity Hypothesis further suggests that these gender differences in processing are only likely to occur when message or task factors do not strongly encourage a particular type of processing strategy. While women are more likely than men to consider all the available information and elaborate on message claims, this difference will be eliminated when the message attributes or response tasks motivate both genders to engage in comprehensive message processing (Meyers-Levy and Maheswaran 1991). Research in this domain also suggests that the genders differ in their thresholds for elaborative processing i.e., in comparison to men, women seem to have a lower threshold for elaborating on message claims. Therefore, gender differences are expected when the message cues exceed the female threshold but not the male (Meyers-Levy and Sternthal 1991). In contrast, no gender differences should be seen when the message cues command very little attention (i.e., lower than the threshold for either gender leading to heuristic processing by both groups) or command a lot of attention (i.e., higher than the threshold for both genders leading to comprehensive processing by both groups).

Over a broad range of perceptual and judgment tasks, research has shown that negative information is more diagnostic and hence is given more weight than positive information (cf. Skowronski and Carlston 1989), a finding that has also been replicated in the advertising context (Maheswaran and Meyers-Levy 1990). These findings imply that women, as more detailed processors, should elaborate more on the negative emotions rather than positive emotions, since such negative emotions are accorded superior diagnostic value. In contrast, heuristic processors are likely to overweigh positive rather than negative information (Levin and Gaeth 1988) suggesting that men should value positive emotions over negative ones. Consistent with the Selectivity interpretation, Dube and Morgan (1996) report that men placed more value on positive emotions and women placed more value on negative emotions. However, researchers have also reported that both male



and female students uniformly value positive evaluative feedback and dismiss negative evaluative feedback (Lundgren and Sampson 1998), a finding that cannot be explained by the comprehensive versus heuristic processing dichotomy.

Darley and Smith (1995) report that, for a low-risk product, women equally favored objective and subjective claims but when the product was of moderate-risk women responded more favorably to objective claims. Men did not respond more favorably to the objective claims in either risk condition. The researchers interpret these findings as being in line with the Selectivity Hypothesis. They argue that men as heuristic processors did not notice the small change in risk level whereas women as comprehensive processors noticed the subtle change and changed their processing strategy. However, under the Selectivity Hypothesis, men as heuristic processors should have focused on those select objective cues that were readily available. This, unfortunately, was not the case. A more plausible alternative explanation of the observed gender differences lies in how the two genders view and tolerate risk. In a variety of situations, men are more inclined to take risks than women, a difference that does not stem from differences in the perceived probability of success (Lauriola and Levin 2001). For example, women (especially young women) have far fewer driving infractions and automotive accidents compared to similarly aged men, a finding used to justify the significant difference in insurance rates for these groups. Therefore, the observation that men did not notice the change in risk level (from low to moderate) could be because neither risk-level reached the male threshold of risk tolerance. Women, on the other hand, have a lower threshold of risk, and the moderate risk condition could easily have exceeded their risk threshold encouraging them to change their processing strategy.

The Selectivity Hypothesis further predicts a primacy effect for men: "If males favor conceptually driven processing, cues presented early on should guide males' judgments, producing a primacy effect" (Meyers-Levy 1989, p 241); and a recency effect for females: "As cognitive demands surpass available capacity, women's comprehensiveness should be compromised as access to information initially processed would be inhibited. Thus, by default, women should have access to only the last or most recent information presented and be forced to rely on it as a basis of judgment" (Meyers-Levy 1989, p 241). However, in contrast to this prediction, Dube and Morgan (1996) found that women's satisfaction judgments were largely influenced by their initial negative emotions, whereas men's satisfaction judgments depended on their first positive emotions, suggesting a primacy effect for both genders. Further, the recall accuracy results reported by Worth, Smith, and Mackie (1992) are not compatible with the classification of women as comprehensive processors and men as heuristic processors. Finally, compared to heuristic processing, comprehensive processing entails more elaboration and should frequently result in superior decisions. There is no direct or indirect empirical evidence to suggest that women consistently make better decisions than their male counterparts.

In sum, the Selectivity Hypothesis attempts to provide a comprehensive framework for understanding gender differences in information processing and judgment. However, the research support for the model is somewhat mixed. Therefore, it might be useful to consider other possible explanations that can account for the observed gender differences.

### **Item-Specific versus Relational Processing: An Alternative Explanation**

Research in the area of cognitive psychology suggests that there are two types of elaboration (Einstein and Hunt 1980; Hunt and Einstein 1981) that facilitate comprehension in alternative ways. One type of elaboration is called relational processing and emphasizes similarities or shared themes among disparate pieces of information. It might occur spontaneously when people receive many similar message cues. The second type of elaboration, item-specific processing, stresses attributes that are unique or distinctive to a particular message. It might occur spontaneously when people receive multiple message cues that are, in context, largely unrelated to each other. The bulk of research with respect to these two types of processing has focused on situational factors, i.e., what type of target message or contextual setting might encourage one to choose a particular processing style (Hunt and Einstein 1981; Hunt and Seta 1984). However, it is quite possible that individual differences such as culture and gender might predispose consumers toward one type of processing.

Men who are primarily concerned with self-focused, agentic goals are more likely to focus on those message attributes that are most likely to affect them directly. Women who are driven by relationship-oriented, communal goals are more likely to consider all aspects of the message since they are interested in its global impact. In other words, men are likely to pay attention to those key attributes that have the greatest personal impact while women are likely to evaluate several attributes in an attempt to decipher the intricate interrelationships between them. It follows that, all else being equal, men

undertake item-specific processing and women engage in relational processing. It should be noted that this processing dichotomy is somewhat different from that proposed by the Selectivity Hypothesis. The Selectivity interpretation implies that female processing is superior to male processing since comprehensive processing is more effortful and usually leads to better evaluation/judgment. In the item-specific versus relational processing dichotomy there is no suggestion that one type of processing is superior to the other. Each of the genders tends to focus on a different aspect of the available information. Which of the two processing styles leads to superior judgment depends on the characteristics of the particular message, e.g., nature of the highlighted attributes, diagnostic value of individual attributes versus overall product category information, etc.

Before ascribing item-specific processing to men and relational processing to women, it would be appropriate to see if such a dichotomy can explain the gender differences found in the literature. The classification of men as item-specific processors and women as relational processors is consistent with the initial portrayal of men as more analytical and logical and women as more subjective and intuitive (Costa, Terracciano, and McCrae 2001; Haas 1979). Men seem more logical since they focus on a few salient attributes and women seem more subjective since they look for relationships between all the available cues. Such a processing difference is also in line with the observation that, relative to boys, girls indulge in more fantasy play, make greater use of associative renaming of objects, and make more indirect requests showing more sensitivity to others' feelings and social-setting. Relational processing accounts for the more creative, associative, imagery-laced interpretations attributed to women and item-specific processing explains the use of clearly identifiable perceptual attributes or objective concepts by men.

The observation that women use more situation-specific cues in the context of their self-evaluations (Lenny, Gold, and Browning 1983) is also consistent with the portrayal of women as relational processors. Researchers have suggested that boys interpret information in a highly focused categorical fashion and girls form judgments based on the specificities and intricacies of the situation (Gilligan 1982), suggesting that boys use an item-specific processing strategy and girls use a relational processing strategy. This processing difference could also explain the differences commonly observed in the intellectual abilities of men and women (Geary 1996; Halpern 1997; Lawton and Morrin 1999). Male superiority in spatial skills could be partially attributed to item-specific processing which enables them to focus on a single image throughout the task. Women are likely to be at a comparative disadvantage since their relational processing strategy requires them to simultaneously attend to several facets of the figure. On the other hand, linguistic and readings skills require simultaneously attending to and relating individual letters, spelling, syntax, and semantics. Associative processing helps in reading by relating the literal with the figurative and readily transforming written words into imagery. Women due to their tendency to use relational processing are likely to excel in verbal or linguistic skills such as proofing, dictation, passage comprehension, and letter-word identification. The observation that, during evaluation and judgment, men tend to focus only on self-generated information while women focus on both self-generated and other-generated information (Meyers-Levy 1988) is also consistent with the item-specific versus relational hypothesis advanced above: men as item-specific processors are likely to focus on highly salient self-generated information without regard to the social situation while women as relational processors are likely to attend to both self-generated as well as other-generated information in a given social setting.

In sum, there seems to be a reasonable basis to portray men as item-specific processors and women as relational processors. Whether this classification is more appropriate than the Selectivity Hypothesis's portrayal of women as comprehensive processors and men as heuristic processors is an empirical question that has to be resolved using direct process measures. It should be noted, however, that gender is just one of several variables that could influence information processing and judgment. For example, a particular processing style could be encouraged by an appropriate stimulus design or evaluation context. Similarly, variables such as need for cognition, knowledge, and product involvement could engender different processing styles and, thus, overshadow some of the gender differences discussed here.

### **IMPLICATIONS FOR ADVERTISERS**

Based on the review of the literature it is clear that there are significant differences in how men and women behave, process information, and render judgment. These differences emerge from a host of biological and cultural factors and are

further reinforced through the socialization process. While the effect sizes of the gender differences are somewhat modest, they are large enough to warrant the attention of advertisers. Fortunately, there are some broad areas of overlap between the various theories discussed above which suggest a few common guidelines for advertising strategy.

Both the Biological Origin Hypothesis (e.g., hormonal differences, brain organization) and the Social Role Theory, discussed earlier, have been widely researched and there is reasonable support for a number of their claims. While it is undoubtedly true that significant biological differences exist between men and women, it is also true that the socialization process is likely to enhance rather than diminish these differences. Therefore, each gender is biologically and socially trained to value traits common to one's own gender. This is manifested in men preferring advertising messages that feature competition and show dominance and in women preferring messages that show importance to self as well as others (Prakash 1992). Also, more symmetrically organized female brain (Saucier and Elias 2001) seems to give women memory advantages with respect to visual as well as verbal stimuli in advertisements (Edens and McCormick 2000) compared to their male counterparts whose hemispheres are more specialized. For example, the specialized hemispheric processing by men suggests that they might require nonverbal reinforcement (such as pictures, charts, graphs, music, sound effects etc.) of the verbal product information contained in an advertisement. Such nonverbal reinforcement is likely to be conducive to the male specialized style of processing and thus engender memory advantages. The more integrated and symmetrical processing by women suggests that verbal descriptions might lead to deeper processing and superior memory. Thus, nonverbal information contained in advertising messages might be more beneficial (in terms of memory advantages) to male consumers as opposed to female consumers.

In societies that strongly prescribe traditional sex roles, men and women are likely to respond more favorably to messages that are in tune with the appropriate gender stereotype. In recent years, traditional sex roles have changed significantly in western societies due to more enlightened attitudes and more women entering the workforce. In fact, across two meta-analyses and spanning six decades, American women's assertiveness rose and fell with their education and work roles (Twenge 2001). However, despite such improvements in assertiveness, the traditional gender stereotypes seem to still apply (at least to some extent) in the world of mass media and advertising. Research on gender and mass media shows that men are depicted as autonomous; pictured outdoors or in business settings; and are less likely to be at home. Men are more likely to advertise alcohol, vehicles, and business products while women are usually featured in advertising for domestic products (Fowles 1996). A similar pattern of traditional gender role stereotypes (men in authoritative, occupational roles and women in dependent, domestic roles) was also found in a study of Portuguese television commercials (Neto and Pinto 1998). One explanation for such stereotypical portrayals is that advertisers have been extremely insensitive to the changes in the socio-cultural landscape. However, this explanation seems somewhat naïve since advertisers are unlikely to spend billions of dollars in such a foolish manner. In today's competitive environment, the placement of advertisements in broadcast and print media is carefully planned with close attention to the characteristics of the audience. Hence, a more plausible explanation for such stereotyping is that despite the rapid increase in the female participation in the labor market, gender identities have not been so quick to change. In fact, the sex differences in psychological makeup seem to be larger in developed countries (Costa, Terraciano, and McCrae 2001). Thus, advertisers might benefit by creating and conducting gender-based advertising campaigns as long as these are appropriately targeted toward specific gender identities. Such a strategy might work better in a culture where there is a strong gender role prescription. Consistent such reasoning, several advertising studies have shown that consumers respond favorably to advertisements that targeted their perceived gender-role identity rather than biological sex i.e., more masculine women preferred modern portrayals and more feminine women preferred traditional portrayals (Jaffe 1994; Worth, Smith, and Mackie 1992). Similarly, a recent content analysis shows that advertisements in male magazines were extremely active while those in women's magazines were unusually pleasant (Whissell and McCall 1997).

According to the Selectivity Hypothesis (Meyers-Levy 1989), men are classified as heuristic processors and women are portrayed as comprehensive processors. Such processing differences are likely to influence product evaluation and judgment of the two genders. For example, men and women might attach varying levels of salience to product attributes; differentially use advertised product information when rendering judgment; and exhibit differing threshold levels for elaborate processing of messages. All of these suggest that advertising directed at heuristic processors like men should be simple and focus on a single theme that aids in heuristic processing. An example would be a verbal description of one or two key features along with nonverbal reinforcement (pictures, sounds etc.) of these features. For women, who are

elaborate processors, the advertising strategy should focus on providing a lot of product-related information. Women are more likely to welcome advertisements that are verbally and visually rich, lexically complex and highly informative since such messages are compatible with the needs of elaborate processors. Thus, products targeted towards women should have informative labels and the accompanying advertisements for such products should contain detailed ad copy. Advertisers might also want to tailor their gender-based messages to specific media options to target specific gender identities held by consumers. For example, individuals can be high or low in masculinity and femininity (Bem 1974) suggesting that advertisers can use a gender-specific feminine message when the audience profile indicates a high-feminine/low-masculine orientation, a gender-specific masculine message when the audience consists of a high-masculine/low-feminine orientation and a gender-neutral message in the other two conditions (high-masculine/high-feminine and low-masculine/low-feminine).

The advertising implications of classifying men as item-specific processors and women as relational processors are somewhat different. While advertisers should still tailor their gender-based messages to specific media options, the execution style and content of such gendered messages should have a slightly different focus. Specifically, men, as item-specific processors, might value attribute-based messages that bring out the distinctive or unique features of the claim. This suggests that advertisements targeting men should keep away from features that are common to the product category but should instead focus on one or two features that are unique to the advertised brand. In contrast, women, as relational processors, would value category-based messages that focus on the common themes of the claim rather than its unique features. When targeting women advertisers might benefit by focusing on features that are common to the product category and highlighting how the advertised brand fits in with other brands in the product category. In sum, advertisers might want to use attribute-based copy while targeting a predominantly male audience and a category-based copy while targeting a predominantly female audience. Similarly, visuals in ads targeting men should highlight the distinctive nature of the selected attribute(s), and visuals in ads targeting women should focus on the common theme underlying the various attributes identified in the message.

## REFERENCES

- Bakan, D. 1966. *The Duality of Human Existence*. Chicago, IL: Rand McNally.
- Bem, S.L. 1974. "The Measurement of Psychological Androgyny." *Journal of Consulting and Clinical Psychology* 42: 115-162.
- Berenbaum, S.A. 1999. "Effects of Early Androgens on Sex-Typed Activities and Interests in Adolescents with Congenital Adrenal Hyperplasia." *Hormones and Behavior* 35: 102-110.
- Bleich, D. 1988. "Gender Interests in Reading and Language." In *Gender and Reading: Essays on Readers, Texts, and Contexts*. Editors: E.A. Flynn and P.P. Schweickart. Baltimore, MD: Johns Hopkins University Press, 234-266.
- Buss, D. M. 1995. "Psychological Sex Differences: Origins Through Sexual Selection." *American Psychologist* 50: 164-168.
- Carr, M. and Davis, H. 2001. "Gender Differences in Arithmetic Strategy Use: A Function of Skill and Preference." *Contemporary Educational Psychology* 26: 330-347.
- Costa, P. T., Terracciano, A. and McCrae, R.R. 2001. "Gender Differences in Personality Traits Across Cultures: Robust and Surprising Findings." *Journal of Personality and Social Psychology* 81(2): 322-331.
- Crick, N.R. and Grotpeter, J.K. 1995. "Relational Aggression, Gender, and Social-Psychological Adjustment." *Child Development* 66: 71-722.

- Darley, W. K. and Smith, R. E. 1995. "Gender Differences in Information Processing Strategies: An Empirical Test of the Selectivity Model in Advertising Response." *Journal of Advertising* 24 (1): 41-56.
- Dube, L. and Morgan, M. S. 1996. "Trend Effects and Gender Differences in Retrospective Judgments of Consumption Emotions." *Journal of Consumer Research* 23 (September): 156-162.
- Eagly, A. H. 1987. *Sex Differences in Social Behavior: A Social-Role Interpretation*. Hillsdale, NJ: Erlbaum.
- Eagly, A. H. and Carli, L. 1981. "Sex of Researchers and Sex-Typed Communications as Determinants of Sex Differences on Influenceability: A Meta-Analysis of Social Influence Studies." *Psychological Bulletin* 90 (1): 1-20.
- Edens, K. M. and McCormick, C.B. 2000. "How Do Adolescents Process Advertisements? The Influence of Ad Characteristics, Processing Objective, and Gender." *Contemporary Educational Psychology* 25: 450-463.
- Einstein, G. O. and Hunt, R. R. 1980. "Levels of Processing and Organization: Additive Effects of Individual-Item and Relational Processing." *Journal of Experimental Psychology: Human Learning and Memory* 6: 588-598.
- Everhart, D. E., Shucard, J. L., Quatrin, T. and Shucard, D.W. 2001. "Sex-related Differences in Event-related Potentials, Face Recognition, and Facial Affect Processing in Prepubertal Children." *Neuropsychology* 15(3): 329-341.
- Feshbach, N. and Sones, G. 1971. "Sex Differences in Adolescent Reactions toward Newcomers." *Developmental Psychology* 4(3): 381-386.
- Fischer, E. and Arnold, S. J. 1994. "Sex, Gender Identity, Gender Role Attitudes, and Consumer Behavior." *Psychology & Marketing* 11(2): 163-182.
- Flynn, E.A. 1988. "Gender and Reading." In *Gender and Reading: Essays on Readers, Texts, and Contexts*. Editors: E.A. Flynn and P.P. Schweickart. Baltimore, MD: Johns Hopkins University Press, 267-288.
- Fowles, J. 1996. *Advertising and Popular Culture*. Thousand Oaks, CA: Sage.
- Fry, J. N. 1971. "Personality Variables and Cigarette Brand Choice." *Journal of Marketing Research* 8: 298-304.
- Geary, D.C. 1996. Sexual Selection and Sex Differences in Mathematical Abilities." *Behavioral and Brain Sciences* 19: 229-247.
- Gentry, J. W., Doering, M. and O'Brien, T. V. 1978. "Masculinity and Femininity Factors in Product Perception and Self-Image." In *Advances in Consumer Research*. Editor: H. K. Hunt. Association for Consumer Research, 5: 326-332.
- Gilligan, C. 1982. *In a Different Voice: Psychological Theory and Women's Development*. Cambridge, MA: Harvard University Press.
- Haas, A. 1979. "Male and Female Spoken Language Differences: Stereotypes and Evidence." *Psychological Bulletin* 86: 616-626.
- Hall, J.A. 1984. *Nonverbal Sex Differences: Communication Accuracy and Expressive Style*. Baltimore: Johns Hopkins University Press.
- Halpern, D.F. 1997. "Sex Differences in Intelligence." *American Psychologist* 52: 1091-1102.
- Higgins, E. T. 1976. "Social Class Differences in Verbal Communicative Accuracy: A Question of 'Which Question?'" *Psychological Bulletin* 83(4): 695-714.

- Holbrook, M. 1986. "Aims, Concepts, and Methods for the Representation of Individual Differences in Esthetics Responses to Design Features." *Journal of Consumer Research* 13 (December): 337-347.
- Hunt, R. R. and Einstein, G. O. 1981. "Relational and Item-Specific Information in Memory." *Journal of Verbal Learning and Verbal Behavior* 20: 497-514.
- Hunt, R. R. and Seta, C. E. 1984. "Category Size Effects in Recall: The Role of Relational and Item-Specific Information." *Journal of Experimental Psychology: Learning, Memory and Cognition* 10: 454-464.
- Hyde, J.S. and Linn, M.C. 1988. "Gender Differences in Verbal Ability: A Meta-Analysis." *Psychological Bulletin* 104: 53-69.
- Jaffe, L.J. 1994. "The Unique Predictive Ability of Sex-Role Identity in Explaining Women's Response to Advertising." *Psychology & Marketing* 11(5): 467-482.
- Kelly, J.R. and Hutson-Comeaux, S.L. 1999. "Gender-Emotion Stereotypes are Context Specific." *Sex Roles* 40(1/2): 107-120.
- Keyes, S. 1983. "Sex Differences in Cognitive Abilities and Sex-Role Stereotypes in Hong Kong Chinese Adolescents." *Sex Roles* 9 (8): 853-870.
- Kirouac, G. and Dore, F.Y. 1983. "Accuracy and Latency of Judgment of Facial Expressions of Emotions." *Perceptual and Motor Skills* 57: 683-686.
- Knox, C. and Kimura, D. 1970. "Cerebral Processing of Nonverbal Sounds in Boys and Girls." *Neuropsychologia* 8: 227-237.
- Lauriola, M. and Levin, I.P. 2001. "Personality Traits and Risky Decision-Making in a Controlled Experimental Task: An Exploratory Study." *Personality and Individual Differences* 31: 215-226.
- Lawton, C.A. and Morrin K.A. 1999. "Gender Differences in Pointing Accuracy in Computer-Simulated 3D Mazes." *Sex Roles* 40(1/2): 73-92.
- Lenney, E., Gold, J. and Browning, C. 1983. "Sex Differences in Self-Confidence: The Influence of Comparison to Others' Ability Level." *Sex Roles* 9: 925-942.
- Levin, I. P. and Gaeth, G. J. 1988. "Framing of Attribute Information before and after Consuming the Product." *Journal of Consumer Research* 15 (December): 374-378.
- Maccoby, E. E. and Jacklin, C. N. 1974. *The Psychology of Sex Differences*. Stanford: Stanford University Press.
- Maheswaran, D. and Meyers-Levy, J. 1990. "The Influence of Message Framing and Issue Involvement." *Journal of Marketing Research* 27 (August): 361-367.
- Mallick, S. K. and McCandless, B. R. 1966. "A Study of the Catharsis of Aggression." *Journal of Personality and Social Psychology* 4(6): 591-596.
- McClelland, D. C. 1975. *Power: The Inner Experience*. New York: Irving.
- McClelland, D. C., Atkinson, J. W., Clark, R. A., and Lowell, E. L. 1976. *The Achievement Motivation*. New York: Irvington Publishers Inc.

- Meyers-Levy, J. 1988. "Influence of Sex Roles on Judgment." *Journal of Consumer Research* 14 (March): 522-530.
- Meyers-Levy, J. 1989. "Gender Differences in Information Processing: A Selectivity Interpretation." In *Cognitive and Affective Responses to Advertising*. Editors: Patricia Cafferata and Alice Tybout. Lexington, MA: Lexington, 219-260.
- Meyers-Levy, J. and Maheswaran, D. 1991. "Exploring Differences in Males' and Females' Processing Strategy." *Journal of Consumer Research* 18 (June): 63-70.
- Meyers-Levy, J. and Sternthal, B. 1991. "Gender Differences in the Use of Message Cues and Judgments." *Journal of Marketing Research* 28 (February): 84-96.
- Money, J. and Ehrhardt, A. A. 1972. *Man & Woman, Boy & Girl: The Differentiation and Dimorphism of Gender Identity from Conception to Maturity*. Baltimore: Johns Hopkins University Press.
- Moschis, G. P. 1985. "The Role of Family Communication in Consumer Socialization of Children and Adolescents." *Journal of Consumer Research* 11 (4): 898-913.
- Mulac, A. and Lundell, T. L. 1982. "An Empirical Test of the Gender-Linked Language Effect in a Public Speaking Setting." *Language and Speech* 25 (3): 243-256.
- Nash, S. C. 1975. "The Relationship among Sex-Role Stereotyping, Sex-Role Preference, and Sex Difference in Spatial Visualization." *Sex Roles* 1(1): 15-32.
- Neto, F. and Pinto, I. 1998. "Gender Stereotypes in Portuguese Television Advertisements." *Sex Roles* 39(1/2): 153-164.
- Nowaczyk, R. H. 1982. "Sex-Related Differences in the Color Lexicon." *Language and Speech* 25 (3): 257-265.
- Osborne, J. W. 2001. "Testing Stereotype Threat: Does Anxiety Explain Race and Sex Differences in Achievement?" *Contemporary Educational Psychology* 26: 291-310.
- Pajares, F. and Valiante, G. 2001. "Gender Differences in Writing Motivation and Achievement of Middle School Students: A Function of Gender Orientation?" *Contemporary Educational Psychology* 26: 366-381.
- Pollack, S. and Gilligan, C 1982. "Image of Violence in Thematic Apperception Test Stories." *Journal of Personality and Social Psychology* 42 (1): 159-167.
- Prakash, V. 1992. "Sex Roles and Advertising Preferences." *Journal of Advertising Research* 32 (May/June): 43-52.
- Saucier, D.M. and Elias, L.J. 2001. "Lateral and Sex Differences in Manual Gesture During Conversation." *Laterality* 6(3): 239-245.
- Schultheiss, O.C. 2001. "Assessment of Implicit Motives with a Research Version of the TAT: Picture Profiles, Gender Differences, and Relations to Other Personality Measures." *Journal of Personality Assessment* 77(1): 71-86.
- Sherman, J. A. 1971. *On the Psychology of Women: A Survey of Empirical Studies*. Springfield, IL: C. C. Thomas.
- Skowronski, J. J. and Carlston, D. E. 1989. "Negativity and Extremity Biases in Impression Formation: A Review of Explanations." *Psychological Bulletin* 105 (January): 131-142.

- Sperry, R. W. and Levy, J. 1970. "Mental Capacities of the Disconnected Minor Hemisphere Following Commissurotomy." Paper presented at the Symposium on Asymmetrical Function of the Human Brain. Miami, FL: American Psychological Association.
- Taylor, M.C. and Hall J.A. 1982. "Psychological Androgyny: Theories, Methods, and Conclusions." *Psychological Bulletin* 92: 347-366.
- Twenge, J. M. 2001. "Changes in Women's Assertiveness in Response to Status and Roles: A Cross-Temporal Meta-Analysis, 1931-1993." *Journal of Personality and Social Psychology* 81(1): 133-145.
- Whissell, C. and McCall, L. 1997. "Pleasantness, Activation, and Sex Differences in Advertising." *Psychological Reports* 81: 355-367.
- Witkin, H 1979. "Socialization, Culture and Ecology in the Development of Group Sex Differences in Cognitive Style." *Human Development* 22 (5): 358-372.
- Worth, L. T., Smith, J. and Mackie, D. M. 1992. "Gender Schematicity and Preference for Gender-Typed Products." *Psychology & Marketing* 9 (1): 17-30.