

An Exploratory Meta-Analysis of Gender Differences in the Evaluation of Advertisements^{*}

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Abstract

Although some studies have shown gender differences in the evaluation of messages in advertisements, these differences have not been strongly supported by empirical evidence. Using a meta-analytic technique, this study analyzes the effect sizes of the existing studies on this topic to determine which factors vary the results of the studies..

The results of the exploratory analysis for brand attitudes toward advertisements support both the vividness theory and the sex-role and social dominance theories. However, for purchase intentions, the results do not support both theories. Women show more purchase intentions than men in the evaluation of advertisements, regardless of the message type.

Keywords: Gender Differences, Self vs Others, Visual vs. Verbal, Meta-Analytic Test, Advertising, Brand Attitude, Purchase Intention, Cognitive Resource Matching

INTRODUCTION

Traditionally, companies, such as cosmetics and electronics manufacturers, have targeted primarily one of the sexes. Recently, men increasingly show interest in the purchase of cosmetics and household goods, whereas women display influence in the purchase of electronics and automobiles. To reflect these consumer trends,

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companies have begun to target the nontraditional genders as well as the traditional genders in their categories by delivering gender-specific advertising messages. This raises the question of whether men and women indeed differ in evaluating advertising messages.

For decades, gender difference has received attention from social psychology and marketing. In social psychology, scientists believed that individual differences in physical and mental traits and abilities were biologically determined and began the research on gender difference (Fausto-Sterling 1985; Feingold 1992). Contemporary research on gender differences has focused on cognitive abilities (Linn 1992; Wilder and Powell 1989; Burman, Bitan, and Booth 2008), social behavior (Eagly 1987; Wood, Christensen, Hebel and Rothgerber 1997; Hackl and Lammers 2009), and mate selection preferences (Buss 1987; Feingold 1992). In the marketing area, gender differences have been regarded as one of the important variables of individual differences, and have been extensively discussed in family decision making (Corfman and Lehaman 1987; Ferber and Birnbaum 1980). Recently, many researchers have been interested in gender differences related to memory and attitude (Dahl, Senguta, and Voh 2009; Myers-Levy 1989; Myers-Levy and Zhu 2010; Sengupta and Dahl 2008; Schmitt, Leclerc and Dube-Riou 1988). This research focuses on the information processing of product description in advertisements, and investigates how men and women differ in processing and being persuaded by messages about products and service.

However, existing research on gender difference in advertising does not suggest a clear idea on whether men and women indeed differ in evaluating messages. Although some studies have reported gender differences (Petrevu et al. 2005) in brand attitudes and purchase intentions, gender difference did not emerge consistently; it may be due to differences in subjects, involvement, context, and stimuli. Using a meta-analytic technique, the present study analyzes gender differences in evaluating advertising messages.

The results of this exploratory analysis for brand attitudes toward advertisements supported the sex-role and social dominance theories. However, for purchase intentions, the results did not support the theories. Regardless of the message type, women expressed more purchase intentions than men in the evaluation of advertisements.

Organization of Study

This paper starts with the theoretical issues by reviewing theories on gender differences in the evaluation of messages in advertisements. Then, the next section is devoted to the meta-analytic test of the previous studies in the advertising area. The current study tests the hypothesis that there are gender differences in evaluation of advertisements. This test is followed by the analysis of possible moderators (e.g., self-oriented vs. other-oriented messages). Finally, based on the results, managerial implications and directions for future research are discussed.

THEORETICAL MODELS

Review of Theories in Gender Differences

Research provides several explanations for gender differences in social behavior, personality, and cognitive abilities. There are three major models: the vividness model, the sex-role model, and the social dominance model.

Vividness Model

It has been widely believed that women excel in verbal skills, whereas men show superiority in spatial and mathematical skills. The traditional biological model posits that men and women have differences in biological structure and attributes, such as the development of brain parts (right and left parts) and hormonal and chemical substances in the body (Halpen 1997). These differences cause the differences in cognitive abilities and personality. For example, the left part of women's brain is more developed than that of men's, facilitating a more detailed analysis of individual elements of messages. Women's processing style makes them particularly adept at comprehending verbal materials and performing linguistic tasks.

On the other hand, the right part of men's brain is more developed than is that of women's, facilitating spatial (or holistic) reasoning. Men's processing style makes them particularly proficient at

comprehending pictorial materials and performing visual tasks (Kimura 1969; Kimura and Durnfold 1974). As a result, it has been hypothesized that these differences in cognitive abilities may affect processing messages (e.g., women are more influenced by literary descriptions, whereas men are more influenced by pictorial descriptions). In evaluating advertisements men are expected to be more affected by visual stimuli than women, whereas women are more affected by verbal stimuli than men in evaluating advertisements.

Recent developments in hemispheric lateralization suggest alternative explanations for gender differences in processing information. According to this new biological explanation, two hemispheres are more symmetrically integrated in females, whereas the hemispheres are more specialized in males (Everhart et al. 2001). Women's symmetrically coordinated brain facilitates processing of advertisements with predominantly verbal descriptions, leading to more positive affect than men who rely heavily on the right hemisphere (Saucier and Elias 2001; Myers-Levy 1989). The efficient communication between the two hemispheres may also facilitate the processing of visual messages by women who are exposed to visual stimuli as well as verbal descriptions. If the new biological explanations hold, gender differences might not emerge as the traditional biological explanation contends.

As the old and new biological explanations are not consistent, the present study will leave this point as an empirical question and test the explanations by using the meta-analysis in the empirical section.

For research purposes, this study investigates gender difference in attitudinal judgment and includes brand attitudes and purchase intentions as dependent measures. In addition, the current study focuses on one type of vividness, "visual vs. verbal" as a possible moderator for gender differences in the evaluation of advertisements.

The following two models are social models. These models posit that social and cultural factors influence gender differences in processing information and persuasiveness.

Sex-Role Model

Eagly (Eagly 1987; Eagly and Wood 1999) has developed a social role model. Eagly has argued that gender differences in social

behavior stem from gender roles, which dictate the behavior that is appropriate for males and females. Men and women are guided by gender roles, agentic for men and communal for women.

Prior research in marketing and social psychology has provided evidence for the sex roles in explaining gender differences (Allison et al. 1979; Schmitt, Leclerc and Dube-Rioux 1988; Myers-Levy 1989; Myers-Levy and Sternthal 1991). For example, males' greater favorableness toward issues involving force or violence (Shapiro and Mahajan 1986) has been viewed as consistent with males' greater self-assertion emphasis. Females' greater facility in interpreting nonverbal social messages (Hall 1984) has been regarded as compatible with females' concern in fostering harmony among self and others. According to the sex-role theory (Myers-Levy 1988), gender differences in evaluative judgments will occur in response to sex-consistent or inconsistent appeals. Males might be more influenced by messages that contain agentic sentiments (self-oriented) than those that do not, whereas females' persuasibility might be related to the degree to which communal (i.e., other-directedness) is represented in the appeals.

Social Dominance Model

Social dominance theory argues that the different status in society for men and women may influence differences in gender. Research done in organizational settings (Brown 1979; Kanter 1977) has shown that positions held by men tend to be higher than those held by women. Such hierarchy results in the social behavior of men and women.

Some research on cognitive psychology suggests that women are more concerned with subtle cues and details. Women also pay more attention to the messages related to themselves and others. Hall (1984) asserts that this attentiveness results from females occupying lower status positions and subsequently possessing heightened need and motive to understand subtle interpersonal cues. Females have reason to be attentive to any number of factors that might affect themselves directly and indirectly via dependence on others around them.

In advertising research, women are found to have lower threshold levels of elaboration on a variety of (often) subtle cues in the environment (Myers-Levy and Sternthal 1991). The differences in

elaboration may result in higher degrees of persuasion for women, since more recall of favorable descriptions might lead to more favorable evaluation of messages, forming positive attitudes.

Taken together, the sex-role model and the social dominance model suggest that men are more affected by self-oriented messages than women in evaluating advertisements, whereas women are more affected by other-oriented messages than men in evaluating advertisements. Also, an interaction is expected between gender and the degree to which messages are sex-role consistent.

METHODOLOGY

Sample of Studies

Computer-based information search were conducted using subject words, gender differences, self, and vividness (visual-verbal). In addition to Psychological Abstracts (PsychINFO: 1967-2007), Educational Resources Information Center (ERIC: 1966-2007), this study also searched the reference lists of numerous review articles.

Criteria for Inclusions/Exclusions

The effect size measures of this meta analysis was the gender differences in evaluation of advertisements, i.e., brand attitudes and purchase intentions. Thus, the first criterion was whether subjects received advertising stimuli. The second criterion was whether gender was used as an independent variable. The third criterion was whether brand attitudes and purchase intentions were used as dependent measures. To ensure that the effect sizes were correctly measured as instructed, the fourth criterion was that subjects were adults (including college students and excluding high school students). The current study included two kinds of manipulations: Visual (e.g., slides or pictures) vs. Verbal (e.g., print) messages, and Self-oriented vs. Other-oriented messages. Studies using other manipulations were excluded (e.g., physical objects; a perfume bottle or taste of soft drinks). Also excluded was the document reporting the study that did not provide information sufficient for the computation of effect sizes (see table 1).

Table 1. Variables Coded From Each Study

Variables	Coding
Date of Publication	Year (e.g., 2004)
Publication Form	Journal (e.g., Journal of Marketing)
Gender	Male vs. Female
Message	Advertising Content
Message Modality	Visual vs. Verbal
Type of Self Concept	Self vs. Other
Type of Subject Population	Students, Workers
Attitude Measures	Attitudes toward Brand
Purchase Intentions	Intentions to Buy
Design of the Experiment	(e.g., 2 X 2 factorial Design)

Multiple Measures. Some studies used multiple dependent measures: beliefs toward products, attitudes toward advertising, attitudes toward products (brands), and purchase intentions. This study focused on two dependent measures, “attitudes toward brands” and “purchase intentions.”

Computation and Analysis of Effect Sizes

The effect size calculated was “g”, the gender differences in evaluation of advertisements, divided by the pooled standard deviation (Hedges and Olkin 1985).

$$g = (Y_F - Y_M) / Sp,$$

where, Y_F = Mean for Females in the Evaluation of Advertisement (i.e., Brand Attitudes or Purchase Intentions) in a Treatment Group.

Y_M = Mean for Males in the Evaluation of Advertisement (i.e., Brand Attitudes or Purchase Intentions) in a Treatment Group.

Sp = Pooled Sample Standard Deviation.

In this study the computation of “g” was based on F and t-test for 90% and on means and standard deviations or error terms for 10%. The g’s were converted to d’s by correcting them for bias (i.e., g’s overestimate of the population effect size, which occurs especially for small samples; Hedges and Olkin 1985). Then the study outcomes

were combined by averaging the d's.

$$d = Jm * g$$

where $Jm \sim 1-(3/4m-1)$ and m is the degree of freedom.
(d is a g score that is bias-corrected by Jm).

With each study contributing a single effect size, the overall mean effect size was computed with each of the effect sizes weighted by the reciprocals of its variance (Hedges and Oklin 1985). This weighting procedure gave greater weight to effect sizes that were more reliably estimated.

Homogeneity and heterogeneity refer to the degree of variability in a group of studies. The homogeneity of each set of d's was examined to determine whether the studies shared a common effect size. To determine the relations among the study characteristics and the magnitude of the effect sizes, categorical models were tested. Categorical models, which were analogous to ANOVA, would show if heterogeneous effect sizes were homogeneous within the subgroups, the groups that were established by dividing studies into classes based on study characteristics.

RESULTS

Characteristics of the Studies

Before considering the gender differences in the evaluation of advertising, this study described the characteristics of the studies used in the meta-analysis so that the results would be discussed in connection with these characteristics. Studies typically (a) were published relatively recently (1986-2007); (b) presented advertisements which included product description (e.g., toothpaste), (c) were published in journals (e.g., Psychology & Marketing, the Journal of Marketing Research, the Journal of Consumer Research, and the Journal of Advertising), (d) based the statistical analysis on a moderate number of observations, (e) obtained a significant manipulation check when a check was present, (f) used college and graduate student samples. Thirty four studies were included in the exploratory meta-analysis for brand attitudes and the total number

of subjects was 2,067: 1,052 males and 1,015 females. Twenty six studies were included in the exploratory analysis for purchase intentions and the total number of subjects was 2,572: 1,231 males and 1,341 females.

There were not many studies that met the inclusion/exclusion criteria intended for categorical models. Sample-size limitations frequently have occurred in the previous meta-analyses. For example, although Brown and Stayman (1992) included 47 independent studies, they conducted categorical analyses only with a small number of studies (from 12 to 25 studies) because relatively few studies reported the effects of the variables to compare (see p.37 and p.40 in Brown and Stayman 1992). Unlike Brown and Stayman's comprehensive analysis to assess the general findings across studies, the current exploratory analysis was attempted to test the specific theories. Thus, the number of studies included in the categorical analyses of this study (e.g., 33-34 studies for gender differences in brand attitudes) was sufficient for the purpose of the study.

Study Effect Sizes

The overall mean effect size was computed with each of the effect sizes weighted by the reciprocals of its variance (Hedges and Oklin 1985). The resulting mean (Mean Weighted d+) for brand attitudes was .0382, which was significantly different from the no-difference value .00. The homogeneity hypothesis was rejected, with the significance level ($p < 0.01$). For purchase intentions, the resulting mean (Mean Weighted d+) was 0.1966, which was significantly different from the no-difference value .00. The homogeneity hypothesis for purchase intentions was rejected, with the significance level ($p < 0.01$).

Categorical Models

Since the homogeneity hypothesis was rejected, the current study still proceeded further with categorical analyses. To help interpret the aggregate level effect sizes of studies relating to brand attitudes and purchase intentions in advertising, the present study attempted to determine which characteristics of the studies varied gender differences in the studies. The present study tested two categorical

models, one for the self (or other) manipulations (e.g., self-oriented or other-oriented) and the other for the vividness type (visual or verbal). The self (or other) manipulations were whether the messages of experiments related subjects to self or other. The analyses, shown in tables 2, 3, 4, and, 5, presented categorical models that examined between-classes effects for the self (or other) manipulation and the vividness-type for brand attitudes and purchase intentions.

Categorical Models for the Self (or Other) Manipulations.

For brand attitudes, the categorical model for the self (or other) manipulations was significant ($Q_B = 16.1674$, $p < 0.01$, see table 2). When the manipulation was self-oriented, it enhanced male consumers' attitudes toward products ($d^+ = -0.07095$, $p < 0.05$). On the other hand, when the manipulation was other-oriented, female consumers were more influenced by the messages ($d^+ = 0.1874$, $p < 0.01$).

The self-oriented manipulation may have facilitated male consumers' processing of favorable messages relevant to products, leading to more favorable evaluation. On the other hand, the other-oriented manipulation caught female consumers' attention, helping process favorable messages relevant to products. Gender differences caused by other-orientated messages were greater than those by self-oriented messages. This may be because women care self as well as others, while men care self only (Myers-Levy 1988). The results were consistent with the argument of the sex-role and social dominance models, the model that contended that communal women were other directed, whereas agentic men were more self-oriented, each being likely to be influenced by their sex-role consistent messages.

For purchase intentions, the categorical model for the self (or other) manipulations was significant ($Q_B = 4.298$, $p < 0.05$, see table 4). Whereas the magnitudes of the effects sizes in gender differences were greater under other-manipulations than under self-manipulations, women showed more favorable reactions than men, regardless of the self (or other) manipulations.

The magnitudes of the effect sizes in purchase intentions might be affected by situational factors such as personal relevance (Suh and Yi 2006). The situational factors might induce greater motivation to attend and comprehend the salient information of a product (Petty et al. 1983). As consumers considering purchase of a product

Table 2. Categorical Models for the Self Manipulation: Brand Attitudes

Message Orientation	Sample Size (n)	Mean-Weighed Effect Size (d+)	95% Confidence Interval
Self-Oriented Other-Oriented	21 12	-.0709* .1874**	-.1506/.0087 .0899/.2850
Overall	33	QB = 16.1674 (p < 0.01)	

Note: Effect sizes are positive for differences in the female direction and negative for differences in the male direction.

Q_B: Homogeneity Between (Between Classes Effect)

*: p < 0.05

**: p < 0.01

Study 1 in Myers-Levy (1989) was excluded because of no self (or other) manipulation.

were likely to make a careful evaluation (Zaichkowsky 1986, 1994), purchase decision-making may have increased elaboration of (personally) relevant messages (Celsi and Olson 1988). With more self and personally-relevant concerns women responded more favorably towards self-oriented messages as well as other-oriented messages when making their purchase decisions. That is, women might become more attentive to personally relevant self-oriented messages when they made purchase decisions than when they evaluated a brand, leading to female consumers' higher purchase intentions under both the self and other manipulations.

On the other hand, the context effects through the self manipulations might have helped men elaborate their own sex-consistent messages and enhanced their attitudes toward brands. However, the context effects might not be strong enough to influence men's purchase intentions. Moreover, men considering purchase of a product might be motivated to process more self-oriented messages. As a result, excessive cognitive resources to process information might have generated idiosyncratic thoughts, which might have an unfavorable effect on men's judgment toward the self-oriented messages.

Taken together, as self-oriented messages were more diagnostic for women's purchase decision than brand attitude, the effect sizes of purchase intentions under both the self and other manipulations were positive for differences in the female direction.

Table 3. Categorical Models for the Vividness Type: Brand Attitudes

Vividness	Sample Size (n)	Mean-Weighed Effect Size (d+)	95% Confidence Interval
Visual	24	-.0812*	-.0069/- .1557
Verbal	10	.2037**	.3047/ .1028
Overall	34	QB = 19.86279 (p < 0.01)	

Table 4. Categorical Models for the Self-Manipulation: Purchase Intentions

Message Orientation	Sample Size (n)	Mean-Weighed Effect Size (d+)	95% Confidence Interval
Self-Oriented	16	.14329**	.2368/.0497
Other-Oriented	10	.3272**	.4737/.1806
Overall	26	QB = 4.29 (p < 0.05)	

Note: Effect sizes are positive for differences in the female direction and negative for differences in the male direction.

QB: Homogeneity Between (Between Classes Effect)

*: p < 0.05

**: p < 0.01

Table 5. Categorical Models for the Vividness Type: Purchase Intentions

Vividness	Sample Size (n)	Mean-Weighed Effect Size (d+)	95% Confidence Interval
Visual	19	.1427**	.2319/.0536
Verbal	7	.3904**	.5596/.2212
Overall	26	QB = 6.44 (p < 0.01)	

Categorical Model for the Vividness Levels

For brand attitudes, the categorical model for vividness was significant ($Q_B = 19.8627$, $p < 0.001$, see [table 3](#)). When the vividness was operationalized in terms of visual messages, it enhanced male consumers' attitude toward products ($d+ = -0.0812$, $p < 0.01$). On the other hand, when vividness was operationalized in terms of verbal messages, female consumers were more influenced by the messages

Table 6. Effect Sizes of Studies (Brand Attitudes)

	Study	g	n1	n2	Self	Vividness
Myers-Levy (1989)	1	+	126	126	3	Visual
	2	-	53	53	1	Visual
	3	+	53	53	2	Visual
	4	+	132	128	2	Verbal
Schmitt et al.(1988)	1	+	20	26	1	Verbal
Myers-Levy et al.(1991)	1	+	25	28	1	Visual
McIntyre et al.(1986)	1	+	20	20	1	Verbal
	2	+	20	20	2	Verbal
	3	-	20	20	1	Verbal
Perracchio et al.(1996)	1	+	47	47	2	Visual
Orth et al.(2004)	1	+	20	20	1	Visual
	2	0	20	20	1	Visual
	3	-	19	21	1	Visual
	4	-	20	20	1	Visual
	5	-	20	20	2	Visual
	6	+	21	19	2	Visual
	7	-	20	19	2	Visual
	8	+	20	20	2	Visual
Putrevu (2004)	1	+	32	28	1	Visual
	2	-	32	28	1	Visual
	3	-	32	28	1	Visual
	4	+	32	28	2	Visual
	5	-	32	28	2	Verbal
	6	-	32	28	1	Verbal
	7	+	32	28	2	Verbal
	8	-	32	28	2	Verbal
Putrevu et al. (2004)	1	+	20	20	1	Verbal
	2	-	20	20	1	Visual
	3	-	20	20	1	Visual
	4	+	20	20	1	Visual
	5	+	20	20	1	Visual
	6	+	20	20	1	Visual
	7	-	20	20	1	Visual
	8	-	20	20	1	Visual

Note: n1: the number of samples for females in experiments.

n2: the number of samples for males in experiments

Self: 1. self-oriented manipulation, 2. other-oriented manipulation. 3. no manipulation

Vividness: Visual / Verbal

+: g > 0: Women's mean is greater than Men's.

-: g < 0: Women's mean is less than Men's.

Table 7. Effect Sizes of Studies (Purchase Intentions)

	Study	g	n1	n2	Self	Vividness
Darley et al.(1999)	1	+	58	62	2	Verbal
Myers-Levy et al.(1991)	1	+	25	28	1	Visual
McDaniel(1999)	1	+	89	127	1	Visual
McDaniel et al.(1998)	1	-	38	57	1	Visual
	2	+	41	66	1	Visual
	3	-	36	43	1	Visual
Orth et al.(2004)	1	+	40	40	2	Visual
	2	+	40	41	2	Visual
	3	-	40	39	2	Visual
	4	-	40	40	2	Visual
Putrevu(2004)	1	+	32	28	1	Visual
	2	-	32	28	1	Visual
	3	-	32	28	1	Visual
	4	+	32	28	2	Visual
	5	-	32	28	2	Verbal
	6	+	32	28	1	Verbal
	7	+	32	28	2	Verbal
	8	+	32	28	2	Verbal
Putrevu et al.(2004)	1	+	20	20	1	Verbal
	2	-	20	20	1	Visual
	3	-	20	20	1	Visual
	4	+	20	20	1	Visual
	5	-	20	20	1	Visual
	6	+	20	20	1	Visual
	7	-	20	20	1	Visual
	8	+	20	20	1	Visual

($d_+ = 0.2037$, $p < 0.01$). The traditional biological model suggested that men were more influenced by visual stimuli than were women, whereas women were more influenced by verbal stimuli. The results of the categorical analysis of brand attitudes were consistent with the traditional biological hypothesis.

For purchase intentions, the categorical model for the vividness types was significant ($Q_B = 6.4407$, $p < 0.05$, see table 5). Verbal messages enhanced female consumers' purchase intentions vis-à-vis those of male consumers ($d_+ = 0.390426$, $p < 0.01$). Contrary to the expectation, women showed more favorable responses to visual messages than did men ($d_+ = 0.142782$, $p < 0.01$). According

to Petty et al. (1983), when message recipients are given choices of a product, elaboration increases. When purchase intentions were asked, women (with more cognitive resources available) may have elaborated more of (favorable) visual messages in addition to verbal messages.

Furthermore, all the visual stimuli (used) in the experiments of the current meta-analysis included some or minimal verbal descriptions (e.g., at least “brand names”). As Everhart et al.’s explanation (2001) suggested, the efficient communication between the two hemispheres may have facilitated the processing of messages by women who were exposed to visual stimuli with verbal descriptions. On the other hand, men who tended to be more attentive to visual-oriented messages might have idiosyncratic thoughts, resulting in less favorable evaluation toward visual messages than women (Anand and Sternthal 1989).

Taken together, as women elaborated more (favorable) visual messages when considering a purchase than when evaluating a brand, the effect sizes for purchase intentions under both the visual and verbal manipulations were positive for differences in the female direction.

Tables 6 and 7 show the studies included and coded for the current meta analysis.

CONCLUSIONS AND DISCUSSIONS

The purpose of this study was to study overall gender differences in the evaluations of advertisements by using a meta-analytic test. This topic is interesting, since gender differences have not been strongly supported by empirical evidence. Some studies have shown the differences, while others have not. Using a meta-analytic technique, this study analyzed the results of studies on this topic and sought to determine which factors varied the results of the studies. According to the results, the self (or other) orientations implicated in messages influenced gender differences in the evaluation of brands in the advertisement. When the manipulation was self-oriented,” it enhanced men’s attitude toward brands in advertisements. On the other hand, when the manipulation was other-oriented,” it enhanced women’s attitude toward brands in advertisements. This result was consistent with the hypothesis that

agentic men are more influenced by self-directed messages, whereas communal women are more influenced by other-oriented messages. Therefore, the results of the current exploratory analysis for brand attitudes supported the sex-role and social dominance theories.

The data of this study on vividness and brand attitudes supported the biological theory, which contended that men were more influenced by visual stimuli, whereas women were more influenced by verbal stimuli. The results about gender differences in brand attitudes revealed that women exhibited more positive affect toward verbal messages than men, whereas men showed more positive affect toward visual messages.

When purchase intentions were measured, women expressed more purchase intentions with verbal and visual messages than men. Both the self (or other) manipulations were more effective to women than men.

According to the findings, visual ads or self-oriented messages were more likely to influence men's brand attitudes than women's, but might not be the case in purchase intentions of advertised brands. That is, women's purchase intentions were greater than men's, regardless of the message type. As elaboration increases when purchase decisions were made (Petty et al. 1982), women tended to involve more in the evaluations of messages. For women, the efficient communication of the two hemispheres facilitated more elaborations of visual messages in addition to verbal messages when purchase intentions were asked. With more elaboration of visual messages, women's evaluations of visual messages became more diagnostic for purchase decisions, leading to greater purchase intentions for women than for men.

Other-oriented messages were more likely to influence women's brand attitudes. Subsequently, women's favorable reactions toward sex-consistent messages affected gender differences in purchase intentions of advertised brands. Also, as women's purchase decisions might be determined by personal relevance of messages, women's purchase intentions were more influenced by personally relevant self-oriented messages.

Limitation of the Study and Suggestions for Future Research

First, research in the meta analysis has shown that published work is more likely to be statistically significant ($p<0.05$) than unpublished research (Dickersin et al. 1987; Callaham et al. 1998).

This has been called between-study selective reporting bias. Such bias has been recognized as a potential threat to the validity of any meta-analysis (Colin and Berlin 1988). Future research should include unpublished papers.

Second, within-study selective reporting bias is also an issue (Hutton and Williamson 2000). This type of bias may relate to the selection of outcomes. Future study should carefully select a subset of the analyses, considering outcome subscales, endpoint scores versus changes from the baseline, the cutoff selected for dichotomizing a continuous measure, and the time point on which to focus when the same outcome has been measured at multiple time points.

Third, although focusing on all the hierarchy-of-effect variables could be difficult, the inclusion of variables beyond attitudes and purchase intentions, such as recall, ad attitude, brand awareness, and knowledge formation, would strengthen the study. The dual meditation model posited by Lutz et al.(1983) and Mackenzie et al.(1986) suggested that ad attitude directly affects brand attitude as well as indirectly through brand cognition. The findings were reconfirmed by Stayman et al. (1992), though with weaker effects than expected. With the limited number of study samples that included brand cognitions and ad attitudes, the current study could not test the dual meditation model in gender differences in the evaluation of advertising. With more study samples sufficient for the covariance matrix among the variables, future research may identify the direct and indirect influences of cognition and ad variables in gender differences in the evaluation of advertising.

Fourth, it would also be interesting to investigate the interaction effects between the variables, vividness and self (vs. others) on brand attitudes and purchase intentions. Depending upon the level of vividness, the effects of the self (vs. other) might vary.

The current study explored overall gender differences in the evaluation of advertisements. According to the findings above, men's brand attitudes were more influenced by visual messages, whereas women's brand attitudes were more influenced by verbal messages. Also, both men's and women's brand attitudes were more influenced by sex-role consistent messages than sex-role inconsistent messages. The results of this exploratory analysis may help marketers and advertisers understand how men and women differ in processing information and forming brand attitudes.

Recently, many consumers tend to use online stores, which suggest customized offerings to consumers. The results may assist marketers in building brand attitudes: using other-oriented messages for women's products (e.g., Revlon aging creams), whereas using self-oriented messages for men's products (e.g., Aramis shaving lotions, or Chanel's Perfume, "Egoist"). Vivid advertisements of cosmetics might be more effective for men, while verbal advertisements might be more persuasive for women. Advertisements for financial trading and insurances might be more effective toward female consumers with more other-oriented messages, which may include family concerns, such as education and health for spouses.

Although overall results in purchase intentions showed that there were differences between men and women, not only verbal and other oriented messages, but also visual and self-oriented messages were more effective in influencing purchase intentions for women than for men. Future research may further investigate the possible factors that might affect the relationships between brand attitudes and purchase intentions.

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