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Masculinity and Cognitive Age Perception: An Examination of their Relationship and Implications for Advertising Persuasion

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Abstract This paper explores whether gender and sex role orientation, in terms of masculinity and femininity, may be associated with older cognitive age among young people. It predicts that masculinity should be associated with an older cognitive age. Two surveys (N=254 respondents aged 18–22 years and N=327 respondents aged 18–55 years), conducted in Taiwan, generally support this prediction. Moreover, this study predicts that masculinity influences people's responses to media information that contains age cues, such as ads featuring models of various ages. The findings of another experiment (N=141 respondents) in Taiwan show that young participants who are more masculine like relatively older models to a greater degree, and the degree to which they like the model influences their attitudes toward the advertised brand.

Keywords Advertising · Cognitive age · Femininity · Gender · Masculinity

Introduction

People are socialized to develop different sex role orientations, defined as "an underlying, and not necessarily conscious, perception of the maleness or femaleness of the self" (Biller 1968, p. 92). Sex roles thus represent central aspects of self-concepts (e.g., Lenney 1991; Spence 1984). Sex role orientation in turn usually refers to self-concepts developed in terms of masculinity and femininity (Bem 1981a). Masculinity in this context represents an instrumental orientation, whereas femininity represents an expressive orientation (Bem 1974; Bem et al. 1976). Furthermore, sex role orientation relates to a person's traits, attitudes, and behaviors (Bem 1981a). Specifically, people with high masculinity are oriented toward being instrumental, a trait also often associated with people in their prime age. This study therefore proposes that young people who perceive themselves as masculine, and thus instrumental, also should be more likely to have a relatively older cognitive age.

A person's chronological age often differs from his or her cognitive age (e.g., Barak and Schiffman 1981; Sudbury 2004). For example, elderly people usually perceive their cognitive age as younger than their chronological age, whether in the United States (Barak and Schiffman 1981) or in Taiwan (Bei and Chao 2003). However, little research considers whether some young people might adopt a cognitive age older than their chronological age. When Catterall and Maclaran (2001) discuss why older U.S. people tend to adopt a younger cognitive age, they suggest that most people would prefer to be in their prime. Similarly, young adults, who have not yet reached their prime, might perceive themselves as older to reach their prime age. Exploring young people's perceptions of themselves as older than they chronologically are is important; Chang (2008a) finds that almost half of young participants in Taiwan exhibit cognitive ages older than their chronological age, and Goldsmith and Heiens (1992) note that almost one-third of their young U.S. participants exhibit older cognitive ages. However, it remains unclear why some young people consider themselves more mature. This study attempts to explore this underexamined phenomenon and proposes that self-role orientation, in terms of masculinity, may explain young people's older cognitive age perceptions.

What are the antecedents of cognitive age perception? Prior research unanimously shows that gender plays no

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significant role in cognitive age perceptions (Barak and Rahtz 1999; Barak et al. 2001; Henderson et al. 1995). However, Deaux (1984) argues that gender is not just a biological characteristic but that it can have an effect in terms of sex role orientation, that is, masculinity and femininity. Even if gender is not related to cognitive age perceptions, sex role orientation might be. In addition, sex role orientation and cognitive age represent important self-concepts (Bem 1981a; George et al. 1980; Markus et al. 1982; Stephens 1991). People are motivated to maintain coherent self-concepts, so the elements that define a person's self-concept are usually congruent (Elliott 1986). If an orientation toward being instrumental matches a perception of being of prime age, a young adult's masculinity might relate to his or her cognitive age perception positively.

This article reports the findings of three studies conducted in Taiwan. At the cultural level, Taiwan is less masculine than the United States (Hofstede 1998). Compared with Americans, Taiwanese rate themselves significantly lower on masculinity, but they do not differ on their femininity ratings (Chang 2006a). A culture-congruent value or trait should be more accessible than a culture-incongruent value or trait (Aaker 2000). Therefore, if the correlation between masculinity and older cognitive age exists among young people in a feminine culture, where masculinity is less readily accessible, the findings may be generalized to a masculine culture, where masculinity is more readily accessible.

Drawing on sex role literature in particular, this paper asserts that younger consumers with masculine self-concepts and thus an orientation toward instrumentality should indicate an older cognitive age. That is, masculinity should be a significant and positive predictor of cognitive age. A survey of college students and an online survey of the general public in Taiwan test this proposition. The study also explores potential gender effects on cognitive age perceptions in two ways: whether masculinity predicts cognitive ages among male and female young adults, and whether gender predict cognitive age perceptions, controlling for chronological age.

Another experiment, also conducted in Taiwan, examines the idea that a masculine sex role orientation, with its positive association with cognitive age perception, may influence people's responses to media information that contains age cues. Because 60% of print advertisements in Taiwan feature models (Chang 2008b), models play important roles and can signal which age segment will find an advertised product appealing. In particular, model age may trigger a self-categorization process (Chang 2008a). According to Chang (2008a), the congruency between the perceived age of the model and consumers' cognitive age (not their chronological age) triggers such self-categorization.

Research into self-congruency effects also suggests that ad messages that are congruent with a person's self-concept generate more favorable ad and brand attitudes (Hong and Zinkhan 1995; Chang 2002, 2005a). If masculine self-concepts determine cognitive age perceptions, the degree of a person's masculinity should affect his or her responses to models of various ages in ads. Younger consumers, who are more masculine, should express more favorable attitudes toward relatively older models, which might enhance their attitudes toward the advertised brand.

This study thereby pursues four main objectives: to explore whether sex role orientation, in terms of masculinity, offers a significant predictor of older cognitive age perceptions; to test whether this prediction applies to both men and women; to examine the degree to which masculinity interacts with the perceived age of the models featured in ads to affect model liking and brand attitudes; and to test a mediation model that illustrates the process by which model liking may mediate the interaction effect of masculinity and model age on brand attitudes.

In turn, this research fills two existing literature gaps. First, it extends sex role orientation literature by demonstrating that masculinity is associated not only with personality traits but also with cognitive age perception. Second, it extends advertising literature by demonstrating that masculinity orientation, through its association with cognitive age perceptions, determines consumers' responses to ads that feature models of different ages.

Sex Role Orientation-Masculinity and Femininity

Sex role orientation, in terms of masculinity and femininity, is central to self-concepts (e.g., Lenney 1991; Spence 1984) and has been widely explored (Lenney 1991). This sex role orientation reportedly is learned through socialization processes (Bem 1979). During socialization processes, people add to their belief systems and thus gain an understanding of which personality traits are linked to maleness (masculine traits) and which are linked to femaleness (feminine traits). They then develop their self-concepts along these two dimensions (Palan 2001).

Masculinity and femininity represent independent dimensions of a person's gender schema (Bem 1981a) that coexist within an individual (Gill et al. 1987). People vary in the degree to which they identify as masculine and feminine (Bem 1981a), so men are not necessarily always dominated by masculine self-concepts, nor are women dominated by feminine self-concepts. Both women and men may be dominated by feminine and masculine self-concepts (Chang 2006b).

Masculinity appears to represent "an 'instrumental' orientation, a cognitive focus on getting the job done or the problem solved" (Bem et al. 1976, p. 1016), consistent

with Spence's (1984) view that masculinity pertains to self-assertive instrumental traits. Personality traits such as independence, assertiveness, forcefulness, aggression, and dominance are associated with masculinity (Bem 1974; Palan 2001). In contrast, femininity is thought to represent "an 'expressive' orientation, an affective concern for the welfare of others and the harmony of the group" (Bem et al. 1976, p. 1016), again consistent with Spence's (1984) view that femininity pertains to interpersonal expressive traits. Personality traits such as tenderness, sensitivity, understanding, and gentleness are associated with femininity (Bem 1974; Palan 2001).

Masculinity and femininity explain significant variance in how people respond to information related to these two concepts (Skitka and Maslach 1996). Bem (1974) developed her Sex Role Inventory to measure self-ratings of masculinity and femininity. Scores on the inventory are associated with levels of readiness to process and assimilate information in terms of masculinity and femininity (Bem 1981a). People tend to endorse qualities congruent with their masculinity/femininity orientation (Markus et al. 1982).

Cognitive Age

Cognitive age, or "the age one perceives one's self to be" (Stephens 1991, p. 37), represents a state of mind (Schiffman and Sherman 1991) and an important dimension of the self-concept (George et al. 1980; Stephens 1991). The concept of cognitive age is more inclusive than chronological age, because it consists of four subdimensions: feel-age, look-age, do-age, and interest-age (Barak and Schiffman 1981). Feel-age pertains to how old people feel themselves to be; look-age involves their perception of how old they look; do-age refers to how old people perceive themselves to act; and interest-age is the age reflected by the interests in which people engage. These four dimensions correlate significantly, according to studies conducted in the United States (Barak 1987) and Taiwan (Bei and Chiao 2003).

Prior research also shows that few people perceive themselves as exactly their chronological age (e.g., Barak and Schiffman 1981). The discrepancy between cognitive age and chronological age is a cross-cultural phenomenon that has been documented in the Western cultures, including Finland (Uotinen 1998), the United States (Barak and Schiffman 1981; Uotinen 1998), and the United Kingdom (Sudbury 2004), as well as in Eastern cultures such as India, Korea, and China (Barak et al. 2001) and Taiwan (Bei and Chiao 2003). Most studies highlight the discrepancy between chronological and perceived cognitive age among the elderly (e.g., U.S. study by Barak and Schiffman 1981; British study by Sudbury 2004), but this discrepancy also applies to people in other age segments.

It is important to note that the discrepancy may tend to be smaller for younger people, as Uotinen's (1998) comparative study of American and Finish people and Bei and Chao's (2003) investigations of Taiwanese people show. In addition, whereas older generations usually perceive themselves as younger than their chronological age, the discrepancy is not unidirectional among young people. That is, some young people perceive themselves as older than they really are, whereas others consider themselves younger. Goldsmith and Heiens's (1992) survey of people in four U.S. states shows that 29% of those in their 20s reported a cognitive age older than their chronological age. According to Bei and Chiao (2003), teenagers in Taiwan generally perceive themselves as older than their actual age (mean difference=5.16 months). Chang (2008a) further reports that 43.8% of college students in Taiwan, aged 19–22 years, feel older than their chronological age.

Except for the early studies by Barak and colleagues (Barak 1987; Barak and Schiffman 1981), which explore cognitive age only among women, most studies examine cognitive age perceptions among both men and women (e.g., Bei and Chao 2003; Goldsmith and Heiens 1992). Those that specifically test gender effects indicate that gender plays no significant role in cognitive age perceptions (Barak and Rahtz 1999; Barak et al. 2001; Henderson et al. 1995). Perceiving a cognitive age different from one's chronological age, whether older or younger, seems to be a common phenomenon for both men and women. However, if gender is more than a biological characteristic, as Deaux (1984) suggests, then gender effects may result from sex role orientation. In turn, this article tests the effects of both gender and sex role orientation on cognitive age perceptions.

Self-Concept Consistency and Cognitive Age Perception

Certain psychological traits relate to a younger cognitive age. For example, Linn and Hunger (1979) show that elderly Americans who perceive themselves as younger have a greater internal locus of control, and Barak (1998) finds that among American respondents aged 40–69 years, a younger cognitive age is associated positively with public self-consciousness and self-confidence. Psychological states also relate to cognitive age perceptions; for example, Chua et al. (1990) demonstrate that among the elderly in Singapore, younger cognitive age is associated with greater life satisfaction. Similar findings are reported in the United States (Barak and Rahtz 1999). Unfortunately, these studies only explore psychological traits that predict a younger cognitive age among the elderly, without considering why some young people perceive themselves as older.

Psychological traits also represent part of a person's self-concepts, just as sex role orientation and cognitive age do.

Self-concept literature suggests that psychological traits constitute important parts of people's self-concepts (Harter 1983), defined as "cognitive generalizations about the self, derived from past experience, that organize and guide the processing of self-related information contained in the individual's social experiences" (Markus 1977, p. 64). Moreover, self-concept literature suggests that people are motivated to maintain coherent and stable self-concepts (Elliott 1986). Therefore, elements of a person's self-concept should be congruent. By integrating this research with cognitive age literature, this study proposes that sex role orientation, which is central to self-concept, may relate closely to age perception, which also is central to self-concept. In particular, masculinity should be associated with a desire to be instrumental, as occurs when a person reaches his or her prime age. Those who have instrumentality-oriented masculine self-concepts therefore should exhibit relatively older cognitive age perceptions. In contrast, because femininity relates mainly to being communal and expressive, it should not be related to cognitive age perception.

Prior research shows that both men and women in Taiwan exhibit high masculinity levels (Chang 2006b), so these predictions should apply to both men and women. Separate regression analyses will determine whether the relation between masculinity and cognitive age perceptions holds across gender. Moreover, this study will explore overall gender effects on cognitive age perceptions, controlling for chronological age.

Hypothesis 1: When chronological age and gender is controlled for, masculinity is a significant and positive predictor of cognitive age.

Survey 1

Method

Participants and Procedures

During the fall 2005 semester, 19 classes were randomly selected from a pool of 50 "military drills and health education" classes at a university located in Taipei. From this pool the SPSS software select cases chose 19 randomly selected classes. These 19 classes represent different colleges, including social science, business, engineering, and life sciences. Students attending the classes were asked to fill out a short survey during a class break and received a gift as compensation for the time they spent responding to the survey. Participants were told that their participation was voluntary, the data collected would be confidential, and their identity could not be traced through the survey. The survey included questions about their cognitive age, year of birth, masculinity, femininity, and other filler personality items. The process took less than five minutes. The 254 students who completed the survey (125 men and 131 women) fell into the following age categories: 19 years (65.7%, 99 men and 68 women), 20 years (10.2%, 17 men and 9 women), and 21–22 years (24.0%, 9 men and 52 women).

Measure

Cognitive age Participants reported their cognitive age perceptions using the following four items, adopted from Auken and Barry (1995): "I feel as though I were about age: _____" (feel-age); "I look as though I were about age:____" (look-age); "I do most things as though I were about age:____" (do-age); and "My interests are mostly of those of a person who was about age: _____" (interest-age). One additional item, "I take care of things as though I were _____ years old" (deal-age), also appears in the survey; it correlates significantly with all the other items, with Pearson's r $ps<.01$. The Cronbach's alpha is .71.

Masculinity and femininity On the short version of the Sex Role Inventory (Bem 1981b) participants rated the 20 items on seven-point Likert scales. The Chinese version of the scales is adopted from Chang (2005a). Higher ratings indicate the item is more self-descriptive. The Cronbach's alphas for the masculinity and femininity subscales are .90 and .89, respectively, which indicates good internal reliability.

Results

A MANOVA provides the first examination of overall gender effects. As Table 1 shows, the overall gender effects are significant. Specifically, univariate ANOVA reveals that the significant overall gender effects mainly reflect that the female respondents have a significantly higher chronological age than do the male respondents. Moreover, the female participants have significantly younger look-ages than their male counterparts.

Because chronological age may contribute to cognitive age perceptions, a MANCOVA next uses chronological age as a covariate. The results demonstrate that the overall gender effects become insignificant. However, a univariate ANCOVA finds a significant gender effect on look-age, such that female respondents are more likely to have younger look-age perceptions, even when their chronological age is taken into account.

Hypothesis 1 predicts that masculinity is a significant and positive predictor of cognitive age, controlling for

Table 1 MANCOVA of gender effects in survey 1, survey 2, and the experiment.

	Survey 1							
	MANOVA		MANCOVA					
	F	*p*	*F*	*p*				
	7.66	.01	1.26	.28				
	ANOVA		ANCOVA		Men		Women	
	F	*p*	*F*	*p*	Mean	SD	Mean	SD
Real age	39.46	.01			18.85	.82	19.78	1.44
Feel age	.38	.54	.04	.85	19.91	3.82	20.21	4.02
Look age	4.05	.05	5.34	.02	19.50	3.04	18.83	2.21
Do age	.86	.35	.85	.36	19.72	2.67	19.37	3.32
Interest age	.18	.67	.19	.66	20.11	3.09	19.94	3.56
Deal age	.17	.68	.55	.46	20.49	4.44	20.27	3.92
	Survey2							
	MANOVA		MANCOVA					
	F	*p*	*F*	*p*				
	6.10	.01	5.17	.01				
	ANOVA		ANCOVA		Men		Women	
	F	*p*	*F*	*p*	Mean	SD	Mean	SD
Real age	30.23	.01			26.11	7.89	23.94	4.34
Feel age	7.33	.01	1.39	.24	26.84	9.95	24.58	7.82
Look age	6.18	.01	22.79	.01	24.88	8.01	21.03	4.54
Do age	10.07	.01	2.41	.12	26.55	11.18	24.01	7.20
Interest age	10.33	.01	2.40	.12	26.01	10.14	23.45	6.92
Deal age	5.30	.02	3.41	.07	27.52	9.88	24.63	6.36
	Experiment							
	MANOVA		MANCOVA					
	F	*p*	*F*	*P*				
	2.46	.03	2.16	.06				
	ANOVA		ANCOVA		Men		Women	
	F	*p*	*F*	*P*	Mean	SD	Mean	SD
Real age	3.81	.05			19.43	1.53	20.10	2.46
Feel age	.03	.86	.43	.51	20.77	7.45	20.55	7.57
Look age	.24	.62	2.91	.09	20.24	3.71	19.92	3.99
Do age	.36	.55	.02	.90	20.73	5.55	21.34	6.67
Interest age	.02	.90	.32	.57	21.09	7.89	20.94	5.78
Deal age	3.22	.08	5.03	.03	22.73	8.01	20.77	4.02

chronological age. In the stepwise regression analyses, chronological age enters in the first step. Because gender may partly determine masculinity/femininity self-ratings, participant gender (with male coded "1" and female coded "0") also enters the analysis in the first step. Multicollinearity tests reveal that all variance inflation factors (VIFs) are below 1.48, indicating no multicollinearity problems.

When feel-age is regressed on age, gender, femininity, and masculinity, only the influence of masculinity is significant, $\beta = .16$, $p<.04$, see Table 2. When look-age is regressed on the four variables, only the influence of gender is significant, $\beta = .16$, $p<.02$. For the do-age regression on the four variables, masculinity emerges as the only significant predictor, $\beta = .25$, $p<.01$. Interest-age, regressed on the four variables, prompts only masculinity as a significant predictor, $\beta = .21$, $p<.01$. Finally, the regression of deal-age on the four variables produces masculinity as the sole significant predictor, $\beta = .32$, $p<.01$. Therefore, H1 receives support.

In separate analyses of the responses from male and female participants, the results for the male participants remain as expected, with the exception of look-age. Among male participants, masculinity is a significant and positive predictor of feel-age, $\beta = .34$, $p<.01$, do-age, $\beta = .39$, $p<.01$, interest-age, $\beta = .38$, $p<.01$, and deal-age,

Table 2 Regression results for surveys 1 and 2.

	Survey1									
	Feel age		Look age		Do age		Interest age		Deal age	
Predictors	β	p	β	P	β	p	β	p	β	p
	All participants									
Age	.08	.24	.08	.25	.02	.78	.02	.78	.08	.23
Gender	-.02	.80	.16	.02	.05	.45	.02	.73	.05	.49
Masculinity	.16	.04	-.02	.82	.25	.01	.21	.01	.32	.01
Femininity	.05	.52	-.10	.17	-.08	.31	.01	.99	-.14	.06
	Male participants									
Age	.11	.23	.04	.70	.04	.65	-.01	.93	-.02	.79
Masculinity	.34	.01	-.05	.64	.39	.01	.38	.01	.51	.01
Femininity	-.04	.75	-.12	.30	-.18	.11	-.18	.11	-.26	.01
	Female participants									
Age	.07	.45	.11	.24	.01	.92	.03	.76	.15	.10
Masculinity	-.01	.90	.04	.69	.16	.11	.09	.41	.08	.44
Femininity	.13	.23	-.09	.39	-.01	.93	.14	.20	-.02	.86
	Survey2									
	Feel age		Look age		Do age		Interest age		Deal age	
Predictors	β	p	β	P	β	p	β	p	β	p
	All participants									
Age	.36	.01	.78	.01	.31	.01	.38	.01	.47	.01
Gender	.05	.37	.14	.01	.07	.22	.08	.15	.08	.09
Masculinity	.21	.01	.05	.19	.09	.11	.16	.01	.28	.01
Femininity	-.04	.42	-.04	.21	-.06	.25	-.06	.29	.03	.48
	Male participants									
Age	.46	.01	.83	.01	.26	.01	.40	.00	.49	.01
Masculinity	.19	.02	.04	.46	.15	.10	.19	.03	.32	.01
Femininity	.01	.96	-.05	.37	-.09	.33	-.08	.35	-.01	.98
	Female participants									
Age	.19	.01	.75	.01	.37	.01	.34	.01	.43	.01
Masculinity	.24	.01	.06	.24	.03	.70	.15	.04	.27	.01
Femininity	-.09	.22	-.04	.41	-.05	.51	-.04	.61	.07	.26

β = .51, p<.01, but not look-age, β = −.05, p<.64; see Table 2. However, among female participants, masculinity is not a significant predictor of the different types of cognitive age.

Discussion

The results of this survey provide general support for H1. Except for look-age, masculinity is associated with older cognitive age perceptions, including perceptions related to feel-age, do-age, interest-age, and deal-age, whereas femininity is not. The non-significant finding for look-age probably occurs because unlike the other dimensions, it is not related to being instrumental. For male participants, masculinity is a significant predictor of feel-age, do-age, interest-age, and deal-age, yet among female participants, masculinity does not account for significant variance in any of the types of cognitive age. It is also interesting to note that female participants perceive that they look younger than do their male counterparts.

Masculinity and Older Cognitive Age Perception among the General Public

The inconsistency of the findings between male and female participants may result because the sample is limited to the 18–22 year age range. Therefore, a survey involving participants from other age segments is necessary; the next survey tests the same hypothesis (H1) but recruits participants from various age segments.

Survey 2

Method

Participants and Procedures

In spring 2006, 3,500 members of a portal Web site in Taiwan were randomly selected, through SPSS's select cases function, and sent an e-mail request, asking for volunteers to participate in a survey in exchange for being enrolled in a drawing for an iPod. Those who were willing to participate clicked on a link in the e-mail, which led them to a survey page. They then responded to questions about their cognitive age, year of birth, masculinity, femininity, and other filler personality items. Within a week, 327 people had completed the survey (141 male and 186 female), for a response rate of 9.34%. The respondents constitute the following age categories: 18–20 years (16.1%), 21–25 (55.1%), 26–30 (16.4%), 31–40 (9.0%), 41–50 (2.2%), and older than 51 years (1.2%).

Measure

Cognitive age The five items from the first survey again appear in this survey. The Cronbach's alpha is .81.

Masculinity and femininity The same scale used in Survey 1 is employed for Survey 2. The Cronbach's alphas for the masculinity and femininity subscales are both .89, which indicates good internal reliability.

Results

With regard to the overall gender effects, as Table 1 shows, the MANOVA reveals that the gender effects are significant. Specifically, the univariate ANOVA suggests that the significant overall gender effects mainly reflect the greater age of male participants compared with female participants. As a result, male participants generate significantly higher ratings for the five types of cognitive age.

Because male and female participants differ significantly in their chronological age, a MANCOVA in which chronological age is a covariate is appropriate. The results demonstrate that the overall gender effects remain significant. However, the univariate ANCOVA only indicates a significant gender effect for look-age. Female participants appear more likely to perceive that they look younger than their male counterparts do.

Stepwise regressions to test H1 again include chronological age and gender in the first step (male coded "1" and female coded "0") and masculinity and femininity in the second step. The multicollinearity tests indicate VIFs of less than 1.14, so multicollinearity is not a problem.

When feel-age gets regressed on age, gender, femininity, and masculinity, both age, $\beta = .36$, $p<.01$, and masculinity, $\beta = .21$, $p<.01$, are significant predictors. The regression of look-age on the four variables produces both age, $\beta = .78$, $p<.01$, and gender, $\beta = .14$, $p<.01$, as significant predictors. Do-age regressed on the four variables indicates only age, $\beta = .31$, $p<.01$, as a significant predictor. The interest-age regression prompts age, $\beta = .38$, $p<.01$, and masculinity, $\beta = .16$, $p<.01$, to emerge as significant predictors. Finally, the regression of deal-age on the four variables reveals age, $\beta = .47$, $p<.01$, and masculinity, $\beta = .28$, $p<.01$, as significant predictors.

The separate analyses of responses by male and female participants indicate that among male participants, masculinity is a significant and positive predictor of feel-age, $\beta = .19$, $p<.02$, interest-age, $\beta = .19$, $p<.03$, and deal-age, $\beta = .32$, $p<.01$, but not look-age, $\beta = .04$, $p<.46$ and do-age, $\beta = .15$, $p<.10$; see Table 2. Among female participants, masculinity is a significant and positive predictor of feel-age, $\beta = .24$, $p<.01$, interest-age, $\beta = .15$, $p<.04$, and deal-age, $\beta = .27$, $p<.01$, but not of look-age, $\beta = .06$, $p<.24$, or do-age, $\beta = .03$, $p<.70$; see Table 2.

Discussion

Consistent with the predictions of H1, these results indicate that masculinity predicts older cognitive age perceptions when chronological age is controlled. They also indicate that femininity is not related to cognitive age perception. Similar to the findings reported from Survey 1, gender only determines participants' look-age perceptions. The results generally are consistent with those reported in Survey 1, with three key differences. First, the combined analysis of responses from male and female respondents indicates that the results hold for all three types of age perception. Second, the separate analyses reveal that the results are similar among male and female participants; masculinity serves as a significant predictor of three types of cognitive age—feel-age, interest-age, and deal-age. Third, age is a significant predictor of all five age perception questions.

What are the implications for media persuasion if masculinity predicts a person's cognitive age? Advertising research reveals that when people process advertising messages, their cognitive age, not their chronological age, interacts with the perceived age of the ad models and influences consumer responses to advertising messages (Chang 2008a). Therefore, it becomes important to explore whether a person's masculinity interacts with the perceived age of the advertising model to affect consumer responses to advertising messages.

Ad Models of Various Ages

Cognitive Age and Responses to Ad Models

Prior research on model age considers the age distribution of models in advertisements. For example, content analyses of U.S. and U.K. ads indicate that the majority of models portrayed in magazine ads are younger than 30 years of age (England et al. 1986), whereas the elderly are underrepresented in magazine advertising (Carrigan and Szmigin 1999) and commercials (Swayne and Greco 1987). The same phenomenon exists in Taiwan. In a content analysis, Chang (2008b) reveals that the average perceived age of the major characters in 1,177 print ads is 28.17, and 80.60% of them are younger than 30 years. Subsequent research in the United States considers how elderly consumers respond to models of various ages (Greco et al. 1997; Milliman and Erffmeyer 1990), with the underlying assumption that models offer salient cues that affect consumers' responses to advertising. This assumption should hold whether the target audience is the elderly or younger consumers and across cultures.

When consumers see advertising messages, they implicitly develop for-me or not-for-me perceptions based on model characteristics. Forehand and Deshpande (2001) argue that such self-categorization is a spontaneous and unconscious process that can be triggered by model characteristics, such as ethnicity, gender, or age. People use these salient cues to perceive whether the ad is targeted at them, according to their similarities to the ad model. To the degree that they perceive great congruency with the model, consumers should generate stronger for-me perceptions (Chang 2008a).

This theorization mirrors self-concept literature, which suggests that self-concepts determine the extent to which people notice, learn, or infer information related to the self (Markus 1977; Markus and Wurf 1987). To the degree that the information is relevant to their self-concept, people pay more attention and process it more efficiently. Moreover, self-congruent effects theory suggests that when the self-relevant information is congruent with the person's self-concept, it generates more favorable responses (Cacioppo et al. 1982). Research demonstrates such self-congruent effects in advertising in both the United States and Taiwan (e.g., Hong and Zinkhan 1995; Chang 2000, 2002, 2005a).

Model age might also trigger self-categorization. However, such a categorization likely is based on consumers' cognitive age, not their chronological age (Chang 2008a). Taiwanese consumers who perceive a greater congruency between model age and their own cognitive age generate a higher degree of perceived affinity between the self and the brand, greater brand evaluation involvement, more self-referencing, and more positive brand attitudes (Chang 2008a). The importance of cognitive age also receives support from studies that explore the perceived age of product users. For example, Wen (2004) examines the effect of congruency between Taiwanese participants' perceptions of the ages of product users and their own cognitive ages and finds that the consumers prefer brands whose users offer a perceived age closer to their own cognitive (as opposed to chronological) age. Bei and Chen (2005) replicate Wen's study in Taiwan and note that the self-congruency effect is stronger for cognitive age than for chronological age.

Masculinity and Responses to Ad Models

Drawing on self-age congruency findings, this study proposes that a person's sense of masculinity should interact with model age. Specifically, people with higher levels of masculinity should prefer models of relatively older ages. To ensure realism, this investigation includes only models whose ages are close to or relatively older than the participants', not models that fall into the elderly category (i.e., aged 65 years and older).

Hypothesis 2: When controlling for gender and age, a significant interaction effect occurs between masculinity and perceived model age on model liking.

Because models offer salient cues in advertising, to the degree that consumers like the model, they should transfer their liking to the advertised brand. Therefore, the interaction between masculinity and perceived model age should influence brand attitudes. Moreover, model liking may play a mediating role in this process.

Hypothesis 3: When controlling for gender and age, a significant interaction effect occurs between masculinity and perceived model age on brand attitudes.

Hypothesis 4: Model liking mediates the interactive effect of masculinity and perceived age on brand attitudes.

Experiment

Method

Design and Stimuli

The ad stimuli consist of 16 conditions: 2 (model gender)×2 (product type: watches vs. thumb drives)×4 (model variation). Specifically, male and female participants read one of eight

randomly assigned ads featuring models of their gender for two products (four ads for watches and four ads for thumb drives). In each of the four product ads, four different models of various perceived ages appear, which increases age perception variation and reduces the idiosyncrasies associated with using only one model.

Young models have been shown to work better for youth-oriented products, whereas older models work better for elderly-oriented products (Rotfeld et al. 1981). To reduce the confounding influence of the match between the age orientation of the product and the model's age, watches and thumb drives, products consumed by all age groups, appear in the experiment. The stimulus ads were created by professional copy writers and designers at an ad agency. The prominent models cover the right-hand side of the advertising page.

The three product attributes of watches that consumers regard as most important, according to E-ICP (2005), are featured, such that each watch ad uses the same copy and emphasizes design, durability, and a large selection. On the basis of an online search for product information, the three product attributes selected for the thumb drive ads are design, ease of use, and storage capacity. Again, each thumb drive ad uses the same ad copy. To improve external validity, the stimulus ad appears between two real filler ads.

The stimuli preparation stage consists of two pretests. In the first (N=34), designed to select the ad models, respondents viewed photos of 30 female and 27 male models of Asian ethnicity, selected from the most circulated magazines in Taiwan. Prior research shows that the attractiveness of ad models influences consumers' responses to advertising (for a review, see Joseph 1982). Therefore, the responses to the pretest serve to identify models that are similar in attractiveness but represent a wide age spectrum. As a result, nine photos for each gender were selected to create ads for the second pretest.

The second pretest asks 126 participants (61 male and 61 female) to rate 18 ads that feature nine different male models and nine different female models. Each participant rated three ads with models of their own gender, and the order of the three ads was rotated. On the basis of their ratings, four ads featuring female models and four ads featuring male models that do not differ in their attractiveness move on to be included in the main experiment.

Participants

The participants (N=141; 75 men and 66 women) were recruited via flyers from a university in Taiwan and paid for their participation. The participants represent 15 different departments, and their ages range from 19 to 34, with an average of 20.75 years.

Procedures

At the start of the experimental session, the coordinator informed the participants that the study consisted of two parts. To discourage participants from discerning the actual purpose of the study, the instructions indicated that professors from the communication college were conducting the first part to examine the effects of various ad layouts and formats on information processing, whereas the second part represented a value and personality survey designed by a marketing professor. The participants next read a filler ad, followed by a stimulus ad, and then another filler ad. After reading each ad, they rated their brand attitudes. For the target ads that featured models, they also rated how much they liked the model and the perceived model age. Finally, they answered the questions in the second part, which consisted of the items to assess their cognitive age, year of birth, masculinity, and femininity.

Independent Variables

Perceived age of the model Participants rated the perceived model age using a 5-point item: 1 (age 15–20), 2 (age 21–25), 3 (age 26–30), 4 (age 31–35) and 5 (age 36–40). The average perceived ages of the four male models are as follows: M_{model1}=1.84, SD=.38; M_{model2}=2.21, SD=.54; M_{model3}=2.72, SD=.83; and M_{model4}=2.78, SD=.73 (see Table 3). The average perceived age of the four female models are M_{model1}=1.81, SD=.40; M_{model2}=2.00, SD=.36; M_{model3}=2.13, SD=.34; and M_{model4}=2.59, SD=.51. This variable is mean centered for the regression analyses.

Cognitive age The same five items from the first and second surveys are used here. The Cronbach's alpha is .81. This variable also is mean centered for the regression analyses.

Model and participant gender A common practice in advertising is to feature female models when the products target women and male models when the products target men, because consumers may infer whether a product is for them based on the model's gender. To eliminate influences of self-model gender incongruency on product perceptions, the female participants receive random assignments only to the conditions that feature female models, and male participants are assigned randomly only to the conditions that feature male models. Gender serves as an independent variable in all analyses, with male coded as "1" and female coded as "0."

Masculinity and femininity On a seven-point Likert scale, participants complete the short version of Bem's (1981b) Sex Role Inventory. Higher ratings indicate that the item is more self-descriptive. The Cronbach's alphas for the masculinity and femininity subscales are .90 and .89,

Table 3 Perceived age of featured models.

Gender		1: 15–20	2: 21–25	3: 25–30	4: 31–35	5: 36–40	Mean and SD
Male	Model 1	3	16	0	0	0	Mean: 1.84
		15.8%	84.2%	.0%	.0%	.0%	SD: .38
	Model 2	1	13	5	0	0	Mean: 2.21
		5.3%	68.4%	26.3%	.0%	.0%	SD: .54
	Model 3	1	5	11	0	1	Mean: 2.72
		5.6%	27.8%	61.1%	.0%	5.6%	SD: .83
	Model 4	0	7	8	3	1	Mean: 2.78
		.0%	36.8%	42.1%	15.8%	5.3%	SD: .73
Female	Model 1	3	13	0	0	0	Mean: 1.81
		18.8%	81.3%	.0%	.0%	.0%	SD: .40
	Model 2	1	14	1	0	0	Mean: 2.00
		6.3%	87.5%	6.3%	.0%	.0%	SD: .36
	Model 3	0	15	2	0	0	Mean: 2.13
		.0%	88.2%	11.8%	.0%	.0%	SD: .34
	Model 4	0	7	10	0	0	Mean: 2.59
		.0%	41.2%	58.8%	.0%	.0%	SD: 51

Notes: The five points are: (1) 15–20 years, (2) 21–25 years, (3) 26–30 years, (4) 31–35 years, and (5) 36–40 years

respectively, in support of good internal reliability. These two variables are mean centered for the regression analyses.

Dependent Measures

Model liking On seven-point Likert scales, participants rate the degree to which they agree that the model is "likable," "pleasant," and "favorable"; these items come from Chang's (2005b) ad liking scale, which includes "good," "interesting," "likable," "pleasant," and "favorable." In using the scale to rate a person, the items "good" and "interesting" seem inappropriate, because a good or interesting person might mean more than a likable person, so these two items are dropped. The Cronbach's alpha for this scale is .90. After averaging the ratings of the items, higher scores indicate greater liking.

Brand attitudes On seven-point Likert scales, participants rate the degree to which each of the following evaluative items, adopted from Chang (2002), applies to the brand: "good," "likable," "pleasant," "positive," and "of good quality." The Cronbach's alpha for this scale is .90. In the averaged ratings of the items, higher ratings indicate more positive attitudes.

Results

As Table 1 indicates, the overall gender effects are significant, and the univariate ANOVA suggests that these significant effects result from older female participants compared with the male participants. The gender effects on the four types of cognitive age perceptions are not significant.

Female and male participants differ in their chronological age, so the next step includes a MANCOVA with chronological age as a covariate. The overall gender effects become insignificant when chronological age enters the equation in the first step. The univariate ANCOVA shows that only gender has a significant effect on deal-age. The means suggest that female participants generate lower deal-age perception ratings than do their male counterparts.

Because masculinity is a continuous variable, and the categorization of participants into two groups according to a continuous variable has received serious criticisms (Fitzsimons 2008), stepwise regression analyses serve to test H2–4. Gender and cognitive age get entered in the first step. The multicollinearity tests reveal that all VIFs are below 1.07, indicating no multicollinearity problems.

H2 predicts a significant interaction between masculinity and perceived model age on model liking. The analysis first regresses model liking on participant gender and cognitive age, after which the self-ratings on masculinity, model age, and the interaction between masculinity and model age enter into the equation. The interaction is significant, $\beta = .18$, $p<.01$, which indicates that participants with higher masculinity ratings generate more favorable model liking when the ad model is older. Therefore, H2 receives support. Moreover, female participants generate less favorable model liking, $\beta = -.30$, $p<.01$. When model liking gets regressed on participant gender, cognitive age, femininity rating, perceived model age, and the interaction term between femininity and model age, the interaction is not

significant, β = .12, p<.20, which implies that feminine self-concepts do not affect responses to ad models of various ages.

The test of H3, which predicts a significant interaction effect between masculinity and perceived model age on brand attitudes, first regresses brand attitudes on participant gender and cognitive age, and then self-ratings on masculinity, model age, and the interaction term between masculinity and model age. The interaction is significant, β = .22, p<.01, which indicates that participants with higher ratings of masculinity generate more favorable brand attitudes when the ad features an older model, in support of H3. Moreover, female participants generate less favorable brand attitudes, β = −.24, p<.01, whereas masculine participants generate more favorable brand attitudes, β = .33, p<.01. The regression of brand attitudes on participant gender, cognitive age, femininity rating, model age, and the interaction term between femininity and model age indicates that the interaction is not significant, β = .16, p<.08.

To test whether model liking mediates the interaction effect of masculinity and model age on brand attitudes, as proposed by H4, this study uses four-step procedures described by Baron and Kenny (1986). For each outcome variable, four regression analyses help establish whether (1) the independent variable significantly predicts the proposed mediator; (2) the mediator accounts for significant variance in the dependent variable; (3) the independent variable significantly predicts the dependent variable; and (4) when the independent variable and the mediator both appear in the equation, the influence of the independent variable becomes insignificant but that of the mediator remains significant. The results reported previously have established that the interaction effects on model liking (step 1) and brand attitudes (step 2) are significant. A further regression analysis reveals that model liking predicts significant variance in brand attitudes, β = .44, p<.01, when gender and cognitive age appear in the equation (step 3, see Table 4). Finally, when both model liking and the interaction term are in the equation, the influence of model liking remains significant, β = .38, p<.01, whereas the interaction term does not predict significant variance in brand attitudes, β = .15, p=.06 (Step 4). A Sobel test showed that the effect of the interaction term decreases significantly when model liking is included in the analysis (Z=2.05, p=.02). The findings thus suggest that model liking mediates the relationship between the interaction term and brand attitudes, in support of H4.

Discussion

When controlling for participants' gender and cognitive age, to the degree that participants rate themselves higher on masculinity, they also rate older models and the advertised brand more favorably. Moreover, a mediation analysis confirms that model liking mediates the interaction effect of masculinity and model age on brand attitudes. In a clear contrast though, femininity does not interact with model age to influence model liking or brand attitudes.

General Discussion

Cognitive age perception has important consequences, because people not only feel and think according to their cognitive age but also engage in activities and interests that are consistent with their perceived age (Barak and Gould 1985; Barak and Schiffman 1981). Cognitive age also can predict consumer behavior (Barak 1998; Barak and Gould 1985; Barak and Stern 1985). Moreover, discrepancies between cognitive age and chronological age exist among consumers across various age groups in the United States and Taiwan (Barak and Schiffman 1981; Bei and Chiao 2003). Yet research has paid little attention to the phenomenon by which young people adopt cognitive ages older than their chronological ages, focusing instead on the psychological traits that underlie older people's younger age perceptions (Barak 1998; Chua et al. 1990; Linn and Hunger 1979).

This study extends such research by exploring whether sex role orientation, in terms of masculinity and femininity, may underlie younger people's older age perceptions. People with more masculine self-concepts perceive them-

Table 4 Regression results for H2–H4.

	Model liking		Brand attitudes		Brand attitudes		Brand attitudes	
Predictors	β	P	β	p	β	p	β	p
Gender	−.30	.01	−.24	.01	−.06	.45	−.13	.10
Cognitive age	−.10	.24	−.04	.62	.04	.58	−.01	.97
Masculinity	.10	.23	.33	.01			.29	.01
Model age	−.10	.26	.03	.74			.06	.41
Masculinity by model age	.18	.03	.22	.01			.15	.06
Model liking					.44	.01	.38	.01

selves as older when it comes to feel-age, interest-age, and deal-age, whereas feminine self-ratings do not relate significantly to any type of cognitive age perceptions. Being masculine appears to be associated with instrumentality. For young consumers, a relatively older age also may indicate greater instrumentality. Therefore, those who are higher in masculinity should perceive themselves as older than they really are.

The effects of masculinity seem more robust than the effects of gender. Consistent with past research, when chronological age is controlled for, gender does not influence cognitive age perceptions—with the exception of look-age. Results from Surveys 1 and 2 show that female participants are more likely to have younger look-age perceptions than are male participants. Results from the experiment also indicate that male participants are more likely to have an older deal-age. However, gender is not related to feel-age, do-age, or interest-age.

Barak's (1998) study of people aged 40 years and older indicates that masculinity relates significantly to cognitive age, but unlike the findings reported herein, those with higher masculinity ratings indicate younger cognitive age perceptions. This contrast may suggest that the defining trait of masculinity, instrumentality, is associated with a prime age. That is, elderly persons who have masculine self-concepts may express a younger cognitive age perception, whereas younger people with similarly masculine self-concepts will express older cognitive age perception. Further research should explore this possibility.

Consistent with the findings of the two surveys, the experiment shows that masculinity moderates participants' responses to models of various perceived ages. Participants with more masculine self-concepts favor relatively older models and express positive attitudes toward the advertised brand to a greater extent than do participants with less masculine self-concepts. In contrast, femininity does not moderate participants' responses to models of various perceived ages, consistent with self-concept literature. Because femininity is not associated with age perceptions, the degree to which participants vary on this trait should not affect the attention they direct to the age cue of the models (Markus and Wurf 1987).

Self-concepts orient people to respond more favorably to information or cues that are congruent with their self-concepts (Cacioppo et al. 1982). Ad messages that are congruent with consumers' self-concepts thus are more effective in generating favorable brand attitudes than are incongruent messages. For example, Chang (2000) shows that participants' evaluations of an advertised brand are more positive if the portrayed product user conveys an image congruent with consumers' self-concepts. Chang (2002) also demonstrates that participants with specific sex role orientations generate more favorable attitudes toward a brand when the ad portrays a product user with a congruent sex role image. Because masculinity is associated positively with a relatively older cognitive age, a more mature-looking model should be more congruent with consumers who have masculine self-concepts. Consistent with self-concept literature, such a congruency results in more favorable brand attitudes in this study.

Finally, this study reveals that model liking mediates the interactive effect of masculinity and perceived model age on brand attitudes. Prior research has documented that different spokespersons generate different levels of liking (Leith et al. 1987), and different spokespersons generate different brand attitudes (Goldsmith et al. 2000; Kamins 1989). However, whether model liking plays a role in shaping consumers' attitudes toward a brand has not been established. The mediation model herein reveals that in ads featuring models, model liking plays an important role in shaping consumers' attitudes toward the featured brand.

However, the findings of this study also should be interpreted with regard to its limitations. For example, the models in the ads were selected from the most circulated magazines, which means few of them fall outside of the 20–30 year age range. The selected models represent various ages, but this perceived age spectrum ranges mostly from early 20s to late 20s. Additional research might hire models of different ages with similar attractiveness to pose for the experimental ads, which could help clarify whether people with high masculinity also favor models in their 30s or 40s.

The studies were conducted in Taiwan, so generalizations of the findings to other cultures should proceed only with caution, for two main reasons. First, Taiwan is a less masculine culture than the United States (Chang 2006a). Therefore, if masculinity is associated with a relatively older cognitive age among young people, younger Americans, in contrast with their Taiwanese counterparts, should be *more* likely to perceive themselves as older than their chronological age.

Second, in traditional Chinese society, the elderly have a respected status, and old age is blessed (Holmes and Holmes 2001). Therefore, younger people in Taiwan may perceive themselves as older than young Americans, which implies that young Americans, in contrast with their Taiwanese counterparts, should be *less* likely to perceive themselves as older than their chronological age. However, respecting the elderly may not necessarily mean perceiving oneself as older. As Survey 2 showed, on average, respondents aged over 30 years perceived themselves as 6.33 years younger than they really were, whereas respondents younger than 30 years perceived themselves as 1.69 years older than their chronological age. If respecting the elderly determines how people in a culture

perceive their own age, respondents older than 30 years should perceive themselves as older than they are, which was not the case.

Regardless of the possible cultural differences, this paper fills a key gap in existing literature and suggests some important extensions, including more replications in other cultures, for this research stream.

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