

Chapter 8

Race–Specific Advertising on Commercial Websites: Effects of Ethnically Ambiguous Computer Generated Characters in a Digital World

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ABSTRACT

Avatars and anthropomorphic characters by marketers are becoming more commonplace on commercial web sites. Moreover, a trend among marketers is to use ethnically ambiguous models in advertising to appeal to specific consumer segments. This study helps our understanding of not only how best to segment and appeal to racially diverse consumers but how people interact with virtual human agents in relationship to the literature on audience response to real humans. It was predicted that Blacks would respond more positively to a Black agent, than they would to either a White agent or an ethnically ambiguous agent. It was also expected that Whites would show no difference in their response based on the race of the computer agent. The findings demonstrate that Blacks had more positive attitudes toward a computer agent, had more positive attitudes toward a web site and recalled more product information from a site when the site featured a Black agent vis-à-vis a White agent. Whites showed no significant response difference concerning the agent, the brand or the site based on the racial composition of the computer agents. Interestingly, the ethnically ambiguous character was overall just as effective in persuading both White and Black browsers as were the same-race agents.

Technological advancements in computing, communication technologies and information management have significantly altered the nature of mass media within the last two decades (Chaffee & Metzger, 2001). The establishment

of a virtually limitless wave of channels through increasing broadband connectivity and new technological developments has ultimately led to the ‘demassification’ of the media (Chaffee & Metzger, 2001; Tharp, 2001). The enhanced bi-directionality of communication by virtue of the new information age, has provided users with

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significantly enhanced capabilities to transmit and retrieve information, especially when compared to the mass society era. Individuals now have access to information from a wide array of sources and amplified interactive access (Papacharissi & Rubin, 2000). In addition to this, however, users also have improved capabilities to create and contribute content themselves. Users have more control in the way content is disseminated and received, all at less financial and temporal costs than ever before (Chaffee & Metzger, 2001). In the ongoing march toward media convergence the enhanced ability of users to share information with each other has led to a significant increase in interpersonal influence (Subramani & Rajagopalan, 2003). Particularly in today's current commercial media framework, media outlets, advertisers, and marketers are well advised that they no longer sell goods and services to individual consumers, but are actually in the business of selling goods and services to networks of customers (Rosen, 2000). Other problems faced by mass marketers in today's media environment include the resultant shrinking of traditional mass audiences, and the inability of traditional marketing efforts to capture and hold the attention of their audience.

With ever-increasing informational and interactive access (Papacharissi & Rubin, 2000), consumers are becoming increasingly difficult to reach and their attention equally difficult to attain much less to hold (Rosen, 2000). With so many offerings and available channels, consumers are hardly able to differentiate one company's offerings from another, particularly in e-commerce settings. This has motivated advertising agencies to develop new and innovative ways to capture the attention of their audiences.

Companies are increasing using digital media like the Internet, which offer unique features that may enhance the persuasive effects of advertising and other strategic communication efforts by allowing information to be presented in a multi-modal format that takes advantage of animation

and instantly playing audio and video—*rich media*. Companies utilizing their web sites to promote their brand can benefit from the multi-sensory interaction of sight, sound, and motion. Unlike simple text-only or text-picture appeals, commercials and video clips on the web can be better used to “convey a mood or image for a brand as well as to develop emotional or entertaining appeals that help make a dull product appear more interesting” (Belch & Belch, 2001, p. 354). The perceptually pleasing ability of digital, rich, and vividly presented information on a commercial web site may be inherently interesting, attention-getting, thought-provoking, image producing, emotionally arousing and easy to elaborate upon (Appiah, 2006; Kim, Kardes, Herr, 1989; McGill & Anand, 1989).

A particularly important way to capture audiences' attention and increase the entertainment value and customer satisfaction in virtual shopping environments is to use computer-generated characters or “avatars” on digitally rich commercial web sites (Holzwarth, Jaiszewski, & Neumann, 2006).

Computer-Generated Anthropomorphic Agents: Avatars and Agents

Computer-generated anthropomorphic characters are computer agents or avatars that have been provided human traits or qualities, such as computer generated faces (Gong & Nass, 2007). Computer-generated anthropomorphic characters are frequently imbued with the ability to speak through either computer-generated speech or prerecorded natural speech (Gong & Nass, 2007). These virtual humans are a new and increasingly prominent type of digital communicator, and are being used in many capacities. For instance, virtual humans have been utilized as computer interface agents (Gong & Nass, 2007; Lee & Nass, 2002), as avatars or virtual representations

of self in video games (Eastin, 2006), in virtual environments (Bailenson, Beall, Loomis, Blascovich, & Turk, 2005), and for the purposes of computer-mediated communication (Lee, 2004). Computer-generated anthropomorphic characters are usually categorized as being one of two types, either agents, which are computer-controlled characters, or avatars, which are user-controlled (see Nowak, 2004; Eastin, Appiah, & Cichirillo, in press; Gong & Nass, 2007). Computer-generated characters are being used as digital communicators on websites as well as in computer games and applications with increasing frequency (Gong & Nass, 2007). A major overlooked effect of the proliferation of virtual human characters is that individuals who interact with them are increasingly being exposed to racial entities that are not real humans or real-human representations (Gong, Appiah & Elias, 2007).

Computer-generated anthropomorphic characters are often imbued with basic social identities that frequently include race (Baylor & Kim, 2003; Gong, Appiah, & Elias, 2007). As a result, an important theoretical consideration establishes how ethnicity operates in virtual contexts between source and viewer as opposed to the more traditional communication contexts involving real humans or humans interacting with mediated real-human entities and representations. Simply, do virtual human representations stimulate traditional racial responses of ingroup and outgroup members as often found with real-human entities (Gong, Appiah, & Elias, 2007)? Answers to this and similar questions hold significant implications for individuals of all ethnicities, particularly Blacks.

Ostensibly, Blacks have made significant inroads with respect to their representations in advertisements in traditional media, most notably television and print (Wilkes & Valencia, 1989; Zinkhan, Qualls & Biswas, 1990). Subsequent studies have revealed, however, that Blacks in advertisements are still being utilized in restricted roles (Entman & Rojecki, 2000), for short time

periods (Greenberg & Brand, 1994), and in racially-integrated groups (Wilkes & Valencia, 1989). Additionally, Blacks who do not have expert qualifications or who are not recognizable celebrities have been disproportionately used to advertise low-end, inexpensive products (Bang & Reece, 2003). Ironically, despite a common perception of Blacks living in the U.S. being destitute, they currently have more disposable income than they did in the past, and outspend non-Black consumers in several high margin categories (Cooper, 2004). Continued failure to acknowledge the importance of this demographic could be to the detriment of many organizations. Additionally, a lack of understanding of how race affects consumer attitudes and communication of individuals of all ethnicities in today's current information society could also prove deleterious.

In today's online environment consumers are ever-exposed to racial entities that are computer-generated in a multitude of digital communication environments. There exists, however, limited insight as to the impact of virtual race and ethnicity, particularly in e-commerce settings. Additionally, research has yet to examine ethnic ambiguity as a key predictor of consumer attitudes toward products featured on commercial websites. What the research has shown, however, is that people automatically and unconsciously follow the same social rules when they interact with computers as when they interact with humans (Nass & Moon, 2000; Reeves & Nass, 1996). Nass and colleagues, in the media equation discourse community, have established that social rules such as displays of ingroup favoritism, politeness, reciprocity, gender stereotypes, and personality are applied in much the same way when humans interact with computers as when they interact with other humans (Gong, Appiah, & Elias, 2007). Moreover, with respect to race and ethnicity, Nass and colleagues (2000) have found that agents that are the same ethnicity as participants tend to elicit more positive ratings of social attraction and trustworthiness, as well

as greater conformity than agents of a different ethnicity. A noticeable trend that has been identified by the scant research is an ingroup preference for same-race computer agents. This seems to follow the same pattern of results as that found among the growing body of studies examining real humans (for review see Gong, Appiah, & Elias, 2007). For instance, Baylor and Kim (2003) found that among computer-generated Black and White virtual pedagogical agents, users rated the same-race agents as more engaging and affable. Baylor, Shen, and Huang (2003) also found same-race preference in direct choice-making among Black and White virtual pedagogical agents. However, since the latest cultural trend among marketers is to use ethnically ambiguous models in advertising (Arlidge, 2004), the question arises, how might this process work for agents that are neither White nor Black but racially or ethnically ambiguous?

Ethnically Ambiguous Characters

Marketers are increasingly using ethnically ambiguous models in advertising to appeal to specific consumer segments (Arlidge, 2004). Given nearly seven million Americans identified themselves as members of more than one race in the 2000 census, there appears to be an emerging call in advertising and marketing for the use of ethnically neutral, diverse or ambiguous characters to reach consumers (La Ferle, 2003). A number of marketing experts perceive that character ambiguity in an advertisement is effective because there is a current fascination, particularly among young consumers, with racial-hybrid-looking models (Arlidge, 2004). This attraction by young consumers may be due in part to census data that indicate audiences 25 and under are twice as likely as older adults to identify themselves as multiracial (La Ferle, 2003). For young Blacks 18-29, forty-four percent of them no longer believe it is appropriate to consider Black people as one race (Williams, 2007)

This apparent trend has led some marketers to assume that it may be time to dismiss the use of a specific race as a consumer segmentation indicator (Arlidge, 2004). In fact, some critics argue that the infrequent use of ethnic-specific models in lieu of ethnically ambiguous models is not a recent phenomenon. Sengupta (2002) argues that mixed-raced models have long been casts in advertisements that would generally call for the presence of Black models, and have frequently been used by advertisers as the prototype of ethnic beauty.

This noticeable increase in the use of ethnically ambiguous models in consumer advertising suggests an implicit assumption within the advertising industry that ethnically ambiguous models are more effective than Black models in persuading Black consumers (Sengupta, 2002). Out of this concern, and the prevailing evidence that computer generated characters by marketers are becoming more commonplace on commercial web sites, it seems reasonable to examine the effect that Black, White, and ethnically ambiguous computer-generated agents on a commercial web site may have on Black and White consumers' evaluations of brand sites.

Theoretical Framework

The available research on audiences' responses to ethnically ambiguous characters is less than conclusive. Research indicates that some people neither perceive racially ambiguous characters as a member of their ingroup nor do they perceive them as a member of a relevant outgroup (see Willadsen-Jensen & Ito, 2006). Other research, on the other hand, points to a tendency for audiences to categorize ethnically ambiguous characters as members of an outgroup (Willadsen-Jensen & Ito, 2006). Social identity theory and the distinctiveness principle should provide a better understanding of how audiences process information from both ethnically ambiguous and unambiguous sources.

Social Identity Theory of Inter-group Behavior

A social identity is defined as “that part of an individual’s self-concept that is derived from his knowledge of his membership in a social group (or groups) together with the emotional significance attached to that membership” (Tajfel, 1974, p. 69). Social identity theory asserts that a positive social identity is generally desired and is based on comparisons made between individual’s ingroup and a relevant outgroup (Tajfel, 1974; Tajfel & Turner, 1986). Individuals are motivated to view ingroup members more favorably as a means to maintain or enhance self-esteem (Hogg, 2004; Tajfel & Turner, 1986). Within the social identity theoretical framework, people are assumed to have a fundamental need to achieve and maintain positive social identity for social groups to which they belong.

Research on group identities demonstrates that ingroup-outgroup social comparisons are based on a specific social identity that is both salient to and valued by the ingroup (Hogg, Terry, & White, 1995; Tajfel & Wilkes, 1963). The salience of a distinctive trait determines its accessibility and meaningfulness for group members (Vignoles, Chrysoschoou, & Breakwell, 2000). The greater the salience of the specific social category such as race (Mastro, 2003) the greater one’s ingroup identification and favoritism (Appiah, 2001; Espinoza & Garza, 1985). Race, in particular, may be the most salient social category among minority members (Fujioka, 2005; Phinney, 1990) due in part to their numeric composition in society. According to the theoretical framework associated with the distinctiveness principle (Breakwell, 1986; Brewer, 1991), a person’s sense of belonging and identification is generally strengthened by a group’s unique size in a particular community (Appiah, 2007; Brewer, 1991; Vignoles et al., 2000). The smaller the group’s size the more likely they are to distinguish themselves from other groups (Brewer, 1991). For instance, Black people are a

numeric minority in society; therefore, as a group they should be highly aware and mindful of their race in personal and mediated situations. In contrast, as a numeric majority in society race is not salient or necessarily valued by Whites and may not grow in importance until they are no longer in the majority in specific settings (Phinney, 1992). As a given ethnic group becomes numerically more dominant in a social environment, ethnicity becomes progressively less salient and less valued in the self-concept of its members (McGuire et al., 1978). This is evident by research that demonstrates majority Whites are less likely than minority Blacks and Hispanics to mention their ethnicity when asked to list characteristics that are important in defining themselves (McGuire et al., 1978; Phinney, 1992).

As a result of race being more salient and valued, numeric minorities express more ingroup favoritism than those members who are apart of a numeric majority (see Elias, 2008). In fact, advertising studies on race suggest Whites have no ingroup preference for same-race characters vis-à-vis different-race characters whereas Blacks’ consistently show ingroup favoritism towards same-race characters (Appiah, 2001, 2003, 2007). Specifically, Black audiences are attracted to and more likely to select Black characters (Knobloch-Westerwick, Appiah, & Alter, 2008), rate Black characters more positively (Whittler, 1991; Appiah, 2007), develop more favorable attitudes towards Black-targeted media and its content (Aaker et al., 2000; Appiah, 2001, 2002), and show an increased likelihood of purchasing products promoted by Black characters (Whittler, 1989). These studies suggest that, unlike Whites, when Blacks encounter a same-race computer-generated agent on a commercial web site they should respond more positively than they would to a different-race computer-generated outgroup member such as a White agent or an ethnically ambiguous agent. Therefore, it is predicted that Black Internet surfers will respond more positively to a Black computer-generated character, than

they will to either a White character or an ethnically ambiguous character whereas Whites will demonstrate no response difference based on the race of the computer-generated character. This is further supported by work on social categorization, which is derived from the same metatheoretical framework as social identity theory (Hogg, Hardie, & Reynolds, 1995).

Social identity theorists, and by extension self-categorization scholars, view social groups as being categories of people, such as ingroup and outgroup members for instance, that are consistently “perceptually homogenized” (Hogg, 2004). Outgroups tend to be homogenized more so than ingroup members (Hogg, 2004). During self-categorization, individuals depersonalize their perception of self and others in terms of a group prototype. Depersonalization, then, facilitates inter-individual attitude or ‘liking’ towards others based on the prototypicality of their group membership, as opposed to evaluating them based on individual idiosyncrasy (Hogg, Hardie, & Reynolds, 1995). As a result, it is not difficult to imagine that Blacks will evaluate individuals that meet the prototypical standards of Black exemplars more favorably than they will a source that is less prototypical and which might be more easily classified with outgroup members. This has been supported by the work of Hogg, Hardie, and Reynolds (1995) who found that while attraction in interpersonal relationships relates to overall similarity, attraction among group members is based on prototypical similarity. Black participants, therefore, should respond more favorably to a source that is more prototypically Black. As a result, the following hypotheses have been developed:

- H_1 : Blacks will perceive themselves more similar to the Black agent than they will to either the White or ethnically ambiguous agent.
- H_2 : Blacks will identify more with the Black agent than they will to either the White or the ethnically ambiguous agent.
- H_3 : Blacks will have more positive attitudes toward the Black agent than they will either the White or the ethnically ambiguous agent.
- H_4 : Blacks will have more positive attitudes toward the brand after viewing the website featuring the Black agent than they will after viewing the website featuring either the White or the ethnically ambiguous agent.
- H_5 : Blacks will have more positive attitudes toward the Acura website featuring a Black agent than they will towards a website featuring either a White or an ethnically ambiguous agent.
- H_6 : Blacks will recall more information from the Acura website featuring the Black agent than they will the Acura website featuring either a White or an ethnically ambiguous agent.

It should be noted, that a major assumption that is being made for this study is that a stimulus featuring an animated, young, Black female character with a congruent Black female voice is more prototypically Black than an ethnically ambiguous character or a White character with a similarly racially congruent voice.

METHOD

Participants and Design

One hundred seventy-one undergraduate students (53 Black and 118 White) from a large Midwestern university participated in the study. Fifty-nine percent of the participants were female and forty-one percent were male with a mean age of 21. Participants were recruited from courses in the School of Communication, Black Cultural Center, and the Office of Minority Affairs. The study utilized an experimental method to examine the effects of using Black, White and ethnically

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ambiguous agents on participants' evaluations of a commercial web site. The experiment used a 3 (computer-generated agent: Black, White or ethnically ambiguous) x 2 (participants' race: White or Black) between-subjects design. The study examined the extent to which the race of agent and race of the user affected evaluations of the brand displayed on the website. The six dependent variables include: 1) perceived similarity to agent; 2) identification with the agent; 3) attitude towards the agent; 4) attitude towards the brand; 5) attitude towards the web; and 6) recall of product information.

Stimuli

A version of the Acura car web page was re-created by a professional Web designer. Acura is a luxury brand from the Japanese automaker Honda Motor Company. An automobile site was used because

cars tend to represent a product class of general interest and usage among a broad cross-section of the student collegiate population. Three versions of one of its commercial pages were created, each with identical images and accompanying text related to Acura cars. For each condition a talking, female, computer animated product spokesperson was used. The computer spokespersons' used were SitePal generated characters. SitePal is an Internet-based subscription service that allows users to create animated speaking characters that can be incorporated onto a website. The same female character was used for the study; however, the character's race was modified across the three experimental conditions. That is, the only difference among the three web pages was the ethnicity of the agent (i.e., Black, White, or ethnically ambiguous). Figures 1-3 present the images of the Black, White, and ethnically ambiguous animated characters that were used.

Figure 1. Condition 1: Black female agent

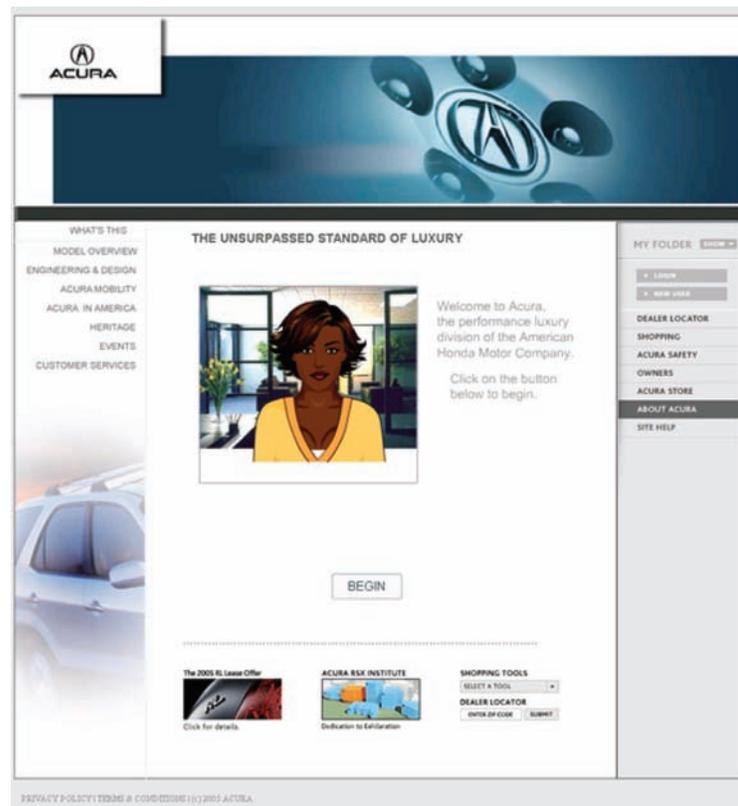
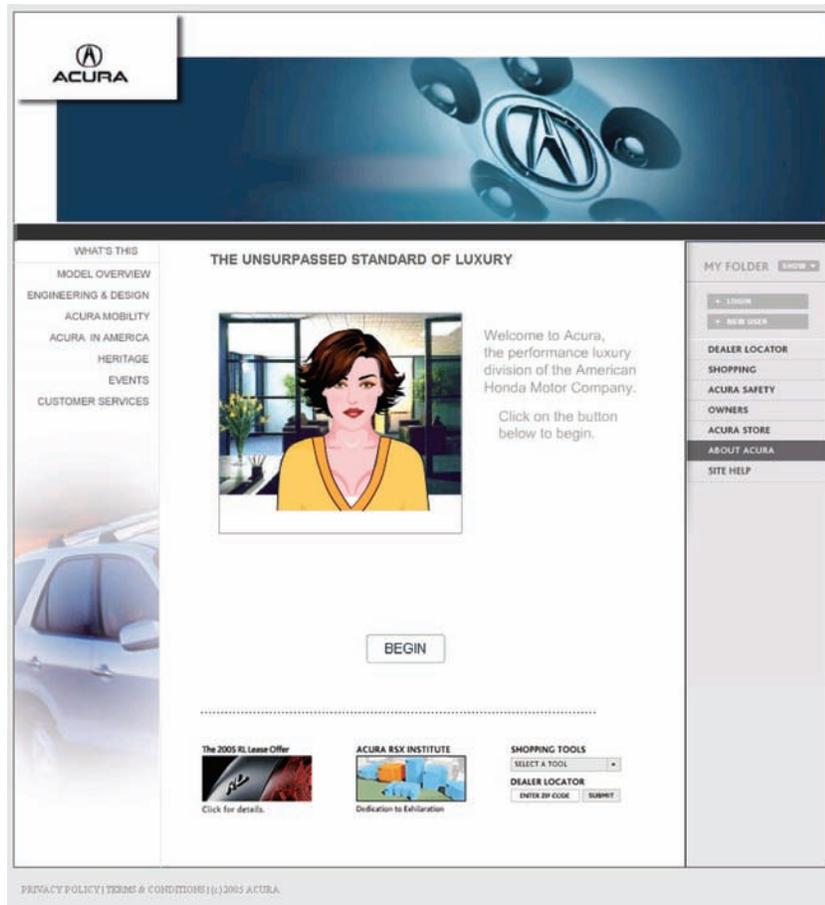


Figure 2. Condition 2: White female agent

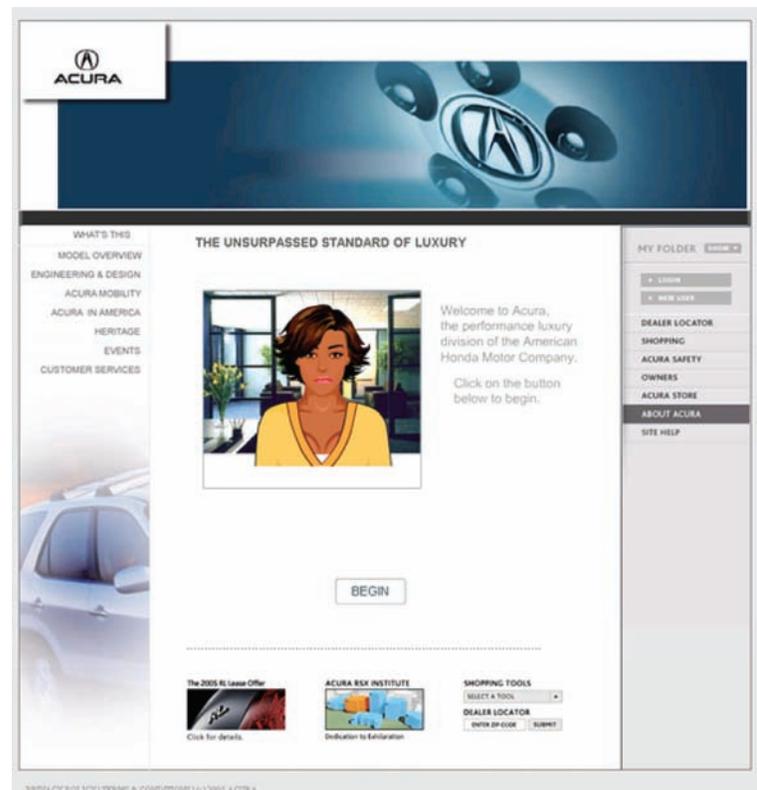


The first condition was the talking, Black animated female agent condition. For this condition a 210 x 315 pixel, animated Black female agent with Black eyes was placed on the left hand side of the screen. This computer-generated anthropomorphic agent used a prerecorded ethnically congruent (i.e., Black female), natural voice, which was synchronized to the lip and facial movements of the character. The second condition was exactly the same as the first condition except that the agent used was a White female with blue eyes. An ethnically congruent (i.e., White female), prerecorded natural voice was used for condition two. The third condition followed the same format, except that the computer-generated character used in this condition was an ethnically ambiguous

female with Black eyes. The voice used for this character was again an ethnically congruent (i.e., mixed-race female), prerecorded natural voice.

The computer-generated female agents were used as spokespeople on the Acura website. Each agent greeted the user and provided instructions concerning how to browse the Acura Web page. For example, the character greeted the participants with the following: "Hello. Welcome to Acura Right Ride! My name is Angie, and I'll be your personal guide today. Based on your responses to just a few questions, we'll help you find a car that best suites your lifestyle." In order to create interaction between the participant and the spokesperson, the agent engaged the user in a number of questions—that were not recorded—

Figure 3. Condition 3: ethnically ambiguous female agent



to which the user responded. Each response by the user activated the agent, leading the agent to provide another statement or ask another question. Each agent asked the user eight questions. Viewers responded to each question by clicking one of five options available for each question. The spokesperson was positioned on the left side of the page, and on the right side of the page were the same questions asked by the female agents (in Word format) along with five mutually exclusive answer options. It should be noted that the questions asked by the agents were merely used to get the participants to interact with the agents in a commercial environment. No data was saved from these questions. Once participants selected an answer the agent would respond in a reassuring way. For example, one question that the agent asked was, “You like clothes that are?” The response options were: trendy, vintage, sporty, classic, or whacky. When participants selected their answer

the agent verbal reply was always, “I don’t know about you but I like to mix it up a little.” Another question asked by the agent was, “What is your favorite form of entertainment?” The response options were movies, comedy, theatre, sports, or music. After selecting a response option, the agent would always reply with, “Those all sound like fun.” Other questions included: “What is your favorite type of food?” “What activity would you prefer to do on vacation?” and “What genre of music do you prefer most?” After each question the user would then click on the “next” button to take them to the next question.

After responding to the eight questions, the agent generated a picture of three cars (Acura RSX, Acura TSX, and Acura MDX) that were supposed to represent cars that fit the lifestyle and personality of the participants based on their responses to the eight questions. The same three cars always appear at the end of the session for

each condition. The agent concluded the session by stating: “Based on your answers to our 8 questions, we feel that any of these 3 cars would be an ideal match for your personality and lifestyle. Thanks for stopping by, and good luck! We know you’ll make the right choice!”

Procedure

Participants in the study went to a lab located in the School of Communication where each was seated in a cubicle and randomly assigned to browse through only one of the three experimental conditions. Participants undertook the experiment on a computer with a 17” monitor. Prior to navigating the Web page, participants were told that the purpose of the Internet study was for researchers to test some changes to Acura’s web site. They were told that their feedback would enable researchers to improve the look, style, and content of the site. All participants navigated through the 8 questions on the Web site, after which, they then answered a questionnaire. Once they completed the questionnaire, participants were debriefed and asked not to tell anyone about what they had seen in the study.

Measurement Instrument

The measurement instrument collected information for the six dependent variables: 1) perceived similarity to the agent; 2) identification with the agent; 3) attitude towards the agent; 4) attitude towards the brand; 5) attitude towards the website; and 6) recall of product information.

Perceived Similarity

Participants rated their degree of similarity to the agent in terms of overall lifestyle, cultural background, dress, appearance, and basic values (Whittler, 1989). A similarity scale was created by averaging the mean scores from each of the five scales. For this scale a coefficient alpha was computed ($\alpha = .86$).

Identification with the Agent

Participants were asked to indicate how strongly they identified with the agent (Aaker, et. al., 2000) on the Acura web site on a seven-point Likert scale ranging from not at all (one) to very strongly (seven).

Attitude Towards the Agent

Participants were asked to provide their attitude towards the agent. An index was created by averaging the mean scores of eleven, 7-point semantic differential scales: boring/interesting, bad/good, negative/positive, useless/useful, worthless/valuable, poor/outstanding, not for me/for me, weak/strong, not appealing/appealing, not attractive/attractive, and not likable/likable. Although these items have been used successfully in other studies and have shown strong evidence of reliability (e.g., Appiah, 2001; Deshpandé & Stayman, 1994), a reliability analysis was conducted. For the attitude towards the agent scale, the coefficient alpha was computed ($\alpha = .93$).

Attitude Towards the Brand

Participants were asked to provide their attitude towards Acura the brand. An index was created by averaging the mean scores of eleven, 7-point semantic differential scales: boring/interesting, bad/good, negative/positive, useless/useful, worthless/valuable, poor/outstanding, not for me/for me, weak/strong, not appealing/appealing, not attractive/attractive, and not likable/likable. For the attitude toward the brand scale, the coefficient alpha was computed ($\alpha = .96$).

Attitude Towards the Website

Participants were asked to provide their attitude towards the Acura website. An index was created by averaging the mean scores of eleven, 7-point semantic differential scales: boring/interesting,

bad/good, negative/positive, useless/useful, worthless/valuable, poor/outstanding, not for me/for me, weak/strong, not appealing/appealing, not attractive/attractive, and not likable/likable. For the attitude toward the website scale, the coefficient alpha was computed ($\alpha = .92$).

Recall

The questionnaire assessed aided recall of specific visual and verbal aspects from the Acura web site and the spokesperson. Aided or cued recall is a commonly used technique in media research (e.g., Beattie & Mitchell, 1985; Gunter, Furnham, & Frost, 1994) and is mentioned as an effective way to measure attention and comprehension of specific media (Beattie & Mitchell, 1985). The recall procedure used in this study was modeled after that used by Appiah (2002) and Gunter and colleagues (1994). This procedure cued participants with verbal and nonverbal aspects of the stimuli to probe recall of media content. There were 8 questions in total that assessed aided recall. These questions included: "Name the models of the 3 Acura cars shown at the end of your session on the web site?" "Where on the site was the following logo located?" "What was the name of the animated female character?" "What color were the 3 Acura cars shown at the end of your session on the web site?" "The slogan located above the animated character read: The Unsurpassed Standard of ____." Participants were given one point for a correct reply, and zero points for an incorrect answer. Thus, a total score of 8 points could be achieved.

Race of Participants

Participants were given a list of racial and ethnic groups from which to choose. Only subjects who indicated their identification with Black/African American or White/European American were included in the analysis.

RESULTS

Manipulation Check

A pretest was conducted whereby twenty Black and twenty White undergraduates were exposed to fifteen female computer-generated characters with varying skin complexion. Among the fifteen characters were the three experimental characters, which were randomly mixed in with the group. Each participant was asked to indicate the race/ethnicity of the female character from a list of racial/ethnic groups (e.g., Asian/Asian American, Black/African American, White/Caucasian, Hispanic, etc.). Among this list participants also had the option of selecting "biracial/multiracial" or "can't tell/don't know." One hundred percent of the Blacks identified the Black character as "Black/African American," one hundred percent identified the White character as "White/Caucasian" and seventy-five percent (15) of the participants identified the ethnically ambiguous character as either "biracial/multiracial" or "can't tell/don't know." Similarly, one hundred percent of Whites identified the Black character as "Black/African American," one hundred percent identified the White character as "White/Caucasian" and sixty-five percent (13) of the participants identified the ethnically ambiguous character as either "biracial/multiracial" or "can't tell/don't know."

A pretest was conducted on eight different voices (3 Black voices, 2 White voices, and 3 mixed-raced voices) that were from people representing Black, White, and mixed-race ethnic groups. Sixteen Black and Sixteen White undergraduates individually listened to each of the human voices. After each voice they were asked to indicate the speaker's race/ethnicity. The voice that was identified as most closely representing each race was chosen for the study. The Black voice that was selected was identified by all 16 Black participants and 14 White participants as a Black voice. The White voice that was selected was identified by all 16 Black and 16 White partici-

pants as a White voice. The ethnically ambiguous voice that was selected was identified as either “biracial/multiracial” or “can’t tell/don’t know” by 10 (63%) of the Black participants, while 4 (25%) participants identified the person as White and 2 (13%) participants identified the person as Black. Eleven (69%) of the White participants identified the voice as either “biracial/multiracial” or “can’t tell/don’t know.”

Hypotheses Testing

A series of two-way analyses of variance were conducted to test the hypotheses. Follow-up analyses were conducted to examine significant findings. The same analyses were conducted for all six dependent variables.

Perception of Similarity

It was hypothesized that Blacks would perceive themselves more similar to the Black agent than they would to either the White or ethnically ambiguous agents. It was also expected that Whites would respond no differently to the agents based on the race of the agents. A significant interaction between participants’ race and agents’ race was found ($F(2, 168) = 43.56, p < .001$). Further

examination of the means using one-way ANOVA (see Table 1) showed that Blacks overall perceived themselves more similar to the Black agent ($M = 5.02, SD = 1.34$) than they did the White agent ($M = 2.24, SD = .89, p < .001$), and the ethnically ambiguous agent ($M = 4.31, SD = 1.16, p < .05$). Moreover, Blacks perceived themselves more similar to the ethnically ambiguous agent ($M = 4.31, SD = 1.16$) than they did the White agent ($M = 2.24, SD = .89, p < .001$). White participants perceived themselves more similar to the White agent ($M = 4.25, SD = 1.07$) than they did either the Black agent ($M = 3.36, SD = .87, p < .001$) or the ethnically ambiguous agent ($M = 3.44, SD = .95, p < .001$, see Table 2). The findings provide support for H1.

Identification

It was hypothesized that Blacks would identify more with the Black agent than with either the White or the ethnically ambiguous agents. A significant interaction between participants’ race and agent’s race was found ($F(2, 170) = 12.22, p < .001$). Further examination of the means using one-way ANOVA indicated that Blacks identified more strongly with the Black agent ($M = 4.56, SD = 1.79$) than they did with the White agent (M

Table 1. Means for Black participants’ responses to race-specific computer-generated female agents with race-specific voice

	Black Internet Browsers		
	Black Female Agent	White Female Agent	Ethnically Ambiguous Agent
Similarity to Agent	5.02 ^a	2.24 ^c	4.31 ^b
Identification with Agent	4.56 ^a	2.06 ^b	4.41 ^a
Attitude Towards Agent	4.76 ^a	3.45 ^b	4.84 ^a
Attitude Towards Brand	4.90	5.16	5.53
Attitude Towards Web	4.79 ^a	4.05 ^c	5.41 ^a
Recall of Product Information	9.50 ^a	4.33 ^c	6.80 ^b

Note. Means with different superscripts differ significantly from each other at $p < .05$.
N = 53.

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Table 2. Means for White participants' responses to race-specific computer-generated female agents with race-specific voice

	White Internet Browsers		
	Black Female Agent	White Female Agent	Ethnically Ambiguous Agent
Similarity to Agent	3.36 ^b	4.25 ^a	3.44 ^b
Identification with Agent	3.28	3.41	3.32
Attitude Towards Agent	4.69	4.43	4.25
Attitude Towards Brand	5.21	5.43	5.31
Attitude Towards Web	4.75	4.95	4.64
Recall of Product Information	7.40	7.88	8.33

Note. Means with different superscripts differ significantly from each other at $p < .05$.
 $N = 118$.

= 2.06, $SD = 1.26$, $p < .001$). Moreover, Blacks identified more with the ethnically ambiguous agent ($M = 4.41$, $SD = 1.58$) than they did with the White agent ($M = 2.06$, $SD = 1.26$, $p < .001$). However, Blacks showed no difference in identification based on whether the agent was Black or ethnically ambiguous. White participants showed no significant difference in their identification based on the race of the agents. These findings provide partial support for H2.

Attitude Towards the Agents

A significant interaction between participants' race and agents' race was found ($F(2, 168) = 5.68$, $p < .01$). An examination of the means using one-way ANOVA indicated Blacks have more positive attitudes toward the Black agent ($M = 4.76$, $SD = 1.41$) than they did toward the White agent ($M = 3.45$, $SD = 1.34$, $p < .01$). Moreover, Blacks had more positive attitudes towards the ethnically ambiguous agent ($M = 4.84$, $SD = 1.08$) than they did towards the White agent ($M = 3.45$, $SD = 1.34$, $p < .01$). However, Blacks demonstrated no difference in their attitude towards the Black agent vis-a-vis the ethnically ambiguous agent. Whites demonstrated no significant difference in their attitude towards the agents based on the

race of the agents. These findings provide partial support for H3.

Attitude Towards the Brand

No significant interaction or main effects were detected for participants' race and agents' race. These findings do not support H4.

Attitude Towards the Website

It was predicted that Blacks would have more positive attitudes toward the website featuring a Black agent than they would the web site featuring a White or an ethnically ambiguous agent. A significant interaction between participants' race and agents' race was found ($F(2, 170) = 9.39$, $p < .001$). As shown in Table 1, the examination of the means indicated Blacks had more positive attitudes toward the Acura web site when it featured a Black agent ($M = 4.79$, $SD = 1.09$) than they did when the web site featured a White agent ($M = 4.05$, $SD = 1.29$, $p < .05$). Moreover, Blacks had more positive attitudes toward the web site when it featured an ethnically ambiguous agent ($M = 5.41$, $SD = .95$) than they did when it featured a White agent ($M = 4.05$, $SD = 1.29$, $p < .001$). White participants displayed no difference in their

attitude towards the web site based on the race of the agents featured on the site. These findings provide partial support for H5.

Recall

It was predicted that Blacks would recall more information from the Acura website featuring the Black agent than they would the website featuring the White or ethnically ambiguous agent. A significant interaction between participants' race and agents' race was found ($F(2, 104) = 7.60, p < .01$). As shown in Table 1, the examination of the means indicated Blacks recalled more information from the Black agent ($M = 9.50, SD = .71$) than they did from the White agent ($M = 4.33, SD = 2.30, p < .01$) or the ethnically ambiguous agent ($M = 6.80, SD = .84, p < .05$). Moreover, Blacks recalled more information from the ethnically ambiguous agent ($M = 6.80, SD = .84$) than they from the White agent ($M = 6.80, SD = 2.30, p < .05$). White participants demonstrated no recall difference based on the race of the agent. The findings support H6.

DISCUSSION

Early communication theorists have argued that the analysis of consumer behavior "goes far beyond its commercial implications into general patterns of human behavior" (Katz and Lazarsfeld, 1955, p. 7). Katz and Lazarsfeld (1995) posit that through an understanding of advertising and its effects on consumers, one can more effectively empirically study human action and develop systematic knowledge. As Elias (2008) articulates, some of the implications of segmenting a market based on race and ethnicity are immense. This study helps academics as well as practitioners understanding of not only how best to segment and appeal to racially diverse consumers but how people interact with virtual human agents in relationship to the literature on real humans. Moreover, the study contributes to

the literature by examining the combined effects of web-based computer agents and ethnically ambiguous agents on Black and White web users' consumer attitudes. Previous research has failed to adequately examine ingroup and outgroup members' evaluations of e-commerce websites featuring racially diverse computer agents, particularly ethnically ambiguous agents.

The results demonstrate that Blacks' perceived themselves more similar to, identified more strongly with, and had more positive attitudes toward the Black computer agent than they did the White computer agent. Moreover, Blacks had more positive attitudes toward the web site and recalled more product information from the site when the brand site featured a Black agent vis-à-vis a White agent. These findings support social identity theory and the distinctiveness principle. Blacks, due to their numeric minority status in society that makes their race more salient and valued to them, responded more favorably to ingroup members (Black agents) than to outgroup members (White agents).

In contrast, despite perceiving themselves more similar to the White agent, Whites showed no significant response difference concerning the agent, the brand or the site based on the racial composition of the computer agents. This seems to support one component of the distinctiveness principle. That is, the greater (less) the salience of a specific social category such as race the greater (less) one's ingroup favoritism (Appiah, 2001; Espinoza & Garza, 1985). Given their majority status in society, Whites may be unaware of their "Whiteness" and place little value on race when making evaluative judgments concerning products.

These findings also seem to confirm that audiences use similar social rules when interacting with computer agents as they do when interacting with real humans. In support, these findings mirror research examining human-to-human interaction with White and Black characters on e-commerce websites (e.g., Appiah, 2003, Appiah, 2007).

A particularly interesting finding in this study is that the ethnically ambiguous character was overall just as effective in persuading both White and Black browsers as were same-race agents. It is possible that neither Blacks nor Whites perceived ethnically ambiguous characters as a member of their ingroup and were unable to seamlessly link them to a member of a relevant outgroup (see Willadsen-Jensen & Ito, 2006).

These results have important implications for marketers struggling to best understand how to effectively advertise to racially diverse consumers in the digital world. The findings suggest that there may no longer be a pressing need to use same-race endorsers to appeal to consumers when ethnically ambiguous characters have the potential to appeal to a broad spectrum of ethnic consumers. Ethnic ambiguous agents may cross ethnic and racial lines that in the past prevented advertising campaigns from being effectively standardized to mass audiences. For instance, the use of ethnically ambiguous characters in ads directed at young racially diverse consumers may quickly become the norm given consumers 25 and under are twice as likely as older adults to identify themselves as multiracial (LaFerle, 2003). Given the possible universal appeal of ethnically ambiguous agents, future research should test these agents alongside same-race agents on Hispanic, Asian, and multiracial consumers. Also, future research should examine the impact of selective exposure methodology on audiences' character preferences. This technique would allow users to select the type of ethnic agent they would like to interact with on the site and give the researcher the ability to unobtrusively measure the persuasive effect of this selection.

These findings may fuel the debate concerning whether advertisers should use targeting strategies based on the race of the consumer (Arlidge, 2004), particularly when using computer-generated agents in virtual e-commerce

environments. Computer-generated virtual human entities are becoming prevalent in a variety of digital communication environments because their technological nature makes them a feasible choice of representation and a natural fit with the computer platform (Gong, Appiah & Elias, 2007). For example, Gong, Appiah and Elias (2007) contend that it is significantly more challenging to program representations of real people into the flow and motion of a virtual world compared to seamlessly embedding digital characters in a virtual world. Also, virtual characters are ubiquitous in computer games and virtual environments, and are also commonly used in Web applications and stand-alone computer applications, such as virtual online news anchors (e.g., <http://www.ananova.com/video>), e-commerce agents (Tanaka, 2000), and virtual educators (Lester, Stone, Converse, Kahler, & Barlow, 1997). Thankfully, communication researchers are beginning their journey in examining the growing phenomenon of virtual human entities and ethnically ambiguous agents.

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