

The Influence of Avatars on Online Consumer Shopping Behavior

An impediment to Web-based retail sales is the impersonal nature of Web-based shopping. A solution to this problem is to use an avatar to deliver product information. An avatar is a graphic representation that can be animated by means of computer technology. Study 1 shows that using an avatar sales agent leads to more satisfaction with the retailer, a more positive attitude toward the product, and a greater purchase intention. Study 2 shows that an attractive avatar is a more effective sales agent at moderate levels of product involvement, but an expert avatar is a more effective sales agent at high levels of product involvement.

The Internet is a major communication and transaction medium. It is estimated that between 700 million and 950 million people used the Internet in 2004 and that close to 500 million of these people were frequent users (i.e., more than once a week). Approximately 200 million people engaged in retail commerce on the Internet, with worldwide retail sales approaching \$70 billion in 2004 (e.g., United States: \$44 billion; Europe: \$10 billion; Asia: \$10 billion). Yearly Internet retail sales growth averaged 30% per year from 2001 to 2005 and is expected to grow at a similar rate in the near future.

Despite the strong growth of Internet sales, this distribution channel has not been as successful as was once projected. In 2000, it was anticipated that as much as 7.8% of U.S. retail sales would be transacted on the Internet in 2005 (Dykema 2000). However, only 2.0% of U.S. retail sales were transacted on the Internet in the fourth quarter of 2004 (U.S. Census Bureau 2005), and an even smaller percentage was transacted in Europe and Asia. The greatest impediment to Internet channel growth has been the low shopper conversion rate, that is, the percentage of visitors to a retail site who actually make a purchase. The conversion rate of Internet shoppers averages only 4.9% among the *top* 100 Internet retailers (Nielsen//NetRatings 2005), a rate significantly lower than experienced by comparable firms using traditional retailing channels. Moreover, research shows that between 65% and 75% of consumers who initiate an online transaction fail to complete the transaction (Mumert & Partner 2001).

Martin Holzwarth is a consultant at Marketing Partner, MP Management Consultants GmbH, Wiesbaden, Germany (e-mail: mh@martinholzwarth.com). Chris Janiszewski is Jack Faricy Professor of Marketing, Warrington College of Business Administration, University of Florida (e-mail: chris.janiszewski@cba.ufl.edu). Marcus M. Neumann is a doctoral student, Department of Business Administration and Marketing II, University of Mannheim (e-mail: marcus.neumann@bwl.uni-mannheim.de). All three authors contributed equally to this work. The authors thank Alan Sawyer for his helpful comments.

To read or contribute to reader and author dialogue on this article, visit <http://www.marketingpower.com/jmblog>.

Survey research suggests that the most significant inhibitors of online shopping are the absence of pleasurable experiences, social interaction, and personal consultation by a company representative (Barlow, Siddiqui, and Mannion 2004; G&J Electronic Media Services 2001). Consumers report that online companies are impersonal, they feel helpless when shopping virtually in unfamiliar or complex product categories, and they want the customer assistance often found in a conventional shopping environment combined with the convenience of Internet shopping. Thus, improving the Internet shopping experience should improve the conversion rate of potential buyers (Childers et al. 2001).

One approach to increasing the entertainment value, information value, and customer satisfaction of Web-based shopping experiences is to use "avatars" (Barlow, Siddiqui, and Mannion 2004; Redmond 2002). Avatars are virtual characters that can be used as company representatives. Avatars can serve as identification figures, as personal shopping assistants, as Web site guides, or as conversation partners. In these roles, avatars have the potential to fulfill the consumer's desire for a more interpersonal shopping experience. Thus, an electronic shopping agent may be able to ease a consumer's navigation of a Web site or provide personalized information, but an avatar can anthropomorphize the interaction and make the shopping experience more interpersonal. Consequently, the information provided on the Web site should be perceived as more credible, the shopping experience should become more enjoyable, and the likelihood of a purchase should increase.

The goal of this research is to investigate the benefits of using avatars as company representatives on commercial Web sites. Two studies show that avatars positively affect an online shopping experience. In Study 1, an avatar communicator creates a more positive perception of the entertainment value and informativeness of a Web site. Consequently, shoppers are more satisfied with the retailer, more positive about the product, and more likely to purchase the product. These avatar advantages persist even when information content is held constant between an avatar and a no-avatar format. Study 2 finds that moderately involved shoppers are more persuaded by attractive-looking avatars and that highly involved shoppers are more persuaded by expert avatars. Attractive avatars are persuasive because of their

likeability, whereas expert avatars are persuasive because of their credibility.

Avatars

The word “avatar” has its derivation in the ancient Indian language Sanskrit and refers to the embodiment of a deity on earth. Consistent with this original definition, present-day definitions of an avatar refer to a representation of an entity. For example, an avatar is described as “a pictorial representation of a human in a chat environment” (Bahorsky, Graber, and Mason 1998, p. 8) or as “a representation of the user as an animated character in virtual worlds” (Loos 2003, p. 17). There are also technology-oriented approaches to defining avatars. For example, the computer trade press describes avatars as “graphic personifications of computers or processes that run on computers” (Halfhill 1996, p. 69). For our purposes, avatars are defined as general graphic representations that are personified by means of computer technology.

Computer-Mediated Interaction

According to the theory of social response, people tend to react to computer technology as though it is a social entity (Moon 2000, 2003; Reeves and Nass 1996). Whenever computer technology exhibits humanlike behaviors, such as language production, taking turns in conversation, and reciprocal responding, the user is more apt to personify the technology (Moon 2000; Nass et al. 1995a). This tendency to treat a computer as a social entity occurs whether the representation of the computer is the screen, a voice, or an agent (Moon 2000). Thus, when people are confronted with a computer or software program, they have a tendency to engage in a “social response to (these) communication technologies,” or what Morkes, Kernal, and Nass (1999) call the SRCT approach.

An early example of a social response to computer technology is provided by Weizenbaum (1976), who exposed experimental participants to a computer-based speech analysis program called ELIZA. This program reformulated inputs from the participants into psychoanalytical questions. The interaction caused participants to develop an emotional relationship to and attribute human characteristics to the computer, even though the participants were fully aware that the computer did not possess a personality (Morkes, Kernal, and Nass 1999). More recent evidence shows that users respond to computers as they do to people in terms of psychosocial phenomena, such as personality, politeness, and flattery (Moon 2003; Nass et al. 1995a; Nass et al. 1995b; Nass and Steur 1993).

Avatar-Mediated Interaction

Research on computer-mediated interactions persuasively demonstrates that computer technology can be personified. Yet the research is silent with respect to the benefits of using an avatar to represent the technology. However, the research on mediated communication may provide insight into this issue. This stream of research suggests that mediated communications (e.g., radio, television) are less persuasive than interpersonal communication because medi-

ated communications lack reciprocity (Horton and Wohl 1956; Rubin, Perse, and Powell 1985). There is also evidence that increasing the reciprocity of a technology-based interaction through verbal disclosures increases compliance with requests made by the technology (Moon 2000). We posit that simply having an avatar pictured during the human-computer interaction will make the interaction feel more conversational and reciprocal. Thus, adding an avatar to a decision support system on a retail Web site will increase the effectiveness of the Web site. This prediction is consistent with recent evidence that relationships are more likely to develop if the computer technology is represented using human forms (Troge mann 2003).

Avatars as Persuasion Agents

If avatars enhance the personification of a technology, they should influence the purchase process in a manner similar to human sales agents. Human sales agents have been shown to increase satisfaction with a retailer, enhance attitudes toward products sold by the retailer, and increase the consumer’s intention to buy (Katz and Lazarsfeld 1955; Webster 1968). Thus, avatars should have a similar impact on the shopping experience (Redmond 2002).

H₁: Avatar-mediated communication has a positive effect on (a) satisfaction with the retailer, (b) attitude toward the product, and (c) purchase intention.

It is also important to understand how avatar-mediated communications can influence purchase behavior. First, there is a long history of evidence that personal communication is more effective than mass-media communication (Williams 1977). Second, there is a long history of evidence that personal communication is more complex, adaptive, and satisfying than other forms of communication (Allen et al. 2002). Both research streams help explain the effectiveness of face-to-face interactions with sales agents. In general, face-to-face interactions with sales agents are effective not only because sales agents can provide information, be empathic, and build rapport (Barlow, Siddiqui, and Mannion 2004) but also because the agent’s information is perceived as more accurate and is more likely to be believed (Soldow and Thomas 1984). In effect, sales agents enhance the value of the information provided and increase the pleasure of the shopping experience, especially in a retailing environment (Reynolds and Beatty 1999). Given that people visit Web sites for entertainment needs and information needs (Eighmey and McCord 1998; Korgaonkar and Wolin 1999), avatar-mediated communications may have an impact similar to human-sales-agent-mediated communications.

H₂: Avatar-mediated communication has a positive effect on (a) the perceived entertainment value of a Web site and (b) the perceived information value of a Web site.

Finally, we expect that the perceived entertainment and information value of a Web site will mediate the consumer’s satisfaction with the retailer, attitude toward the product, and purchase intention. Our expectation of the influence of these mediating factors is related to our previous discussion of deterrents to Internet shopping. Recall that an important deterrent to consumers’ use of the Internet for product pur-

chases is the limited range of personalized services available within this medium. The most notable omission is the lack of face-to-face communication (Phillips et al. 1997). Swaminathan and colleagues (1999) observe that many people have a strong desire for social interaction in their shopping experience. If a marketer can positively affect a customer's mood by providing entertaining content, this should have a positive effect on the perception of the company and its products (Brown and Stayman 1992; MacKenzie and Lutz 1989; MacKenzie, Lutz, and Belch 1986). Similarly, if a marketer can make information seem more relevant and important, this should encourage a more positive response toward the retailer and its offerings (Weitz, Sujan, and Sujan 1986).

H₃: (a) The perceived entertainment value of a Web site and (b) the perceived information value of a Web site mediate the positive influence of an avatar-mediated communication on satisfaction with the retailer, attitude toward the product, and purchase intention.

We summarize these relationships in Figure 1 under the heading "Influence of Avatars."

Designing Effective Avatars

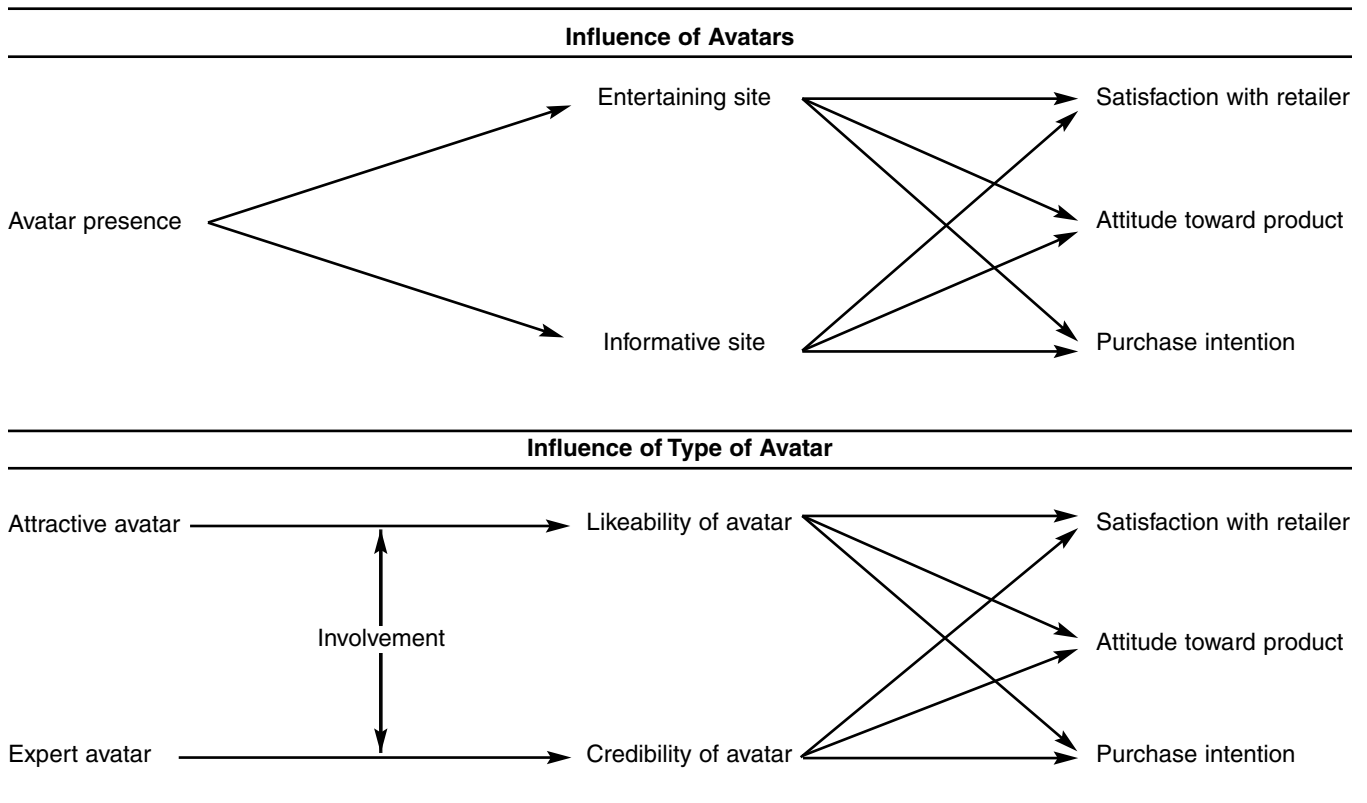
Kelman (1961) explains how three processes of social influence affect the message recipient's acceptance of a message. The first process focuses on the recipient's identification with the communicator. In this case, the recipient adopts the attitude of the communicator through imitation or internalization of the message. The *interpersonal attraction* of the communicator is a prerequisite for motivating

the recipient to adopt the communicator's position. The second process concerns the recipient's perceptions of the communicator's credibility as a consequence of the *expertise* of the communicator and the trust that develops between the communicator and the recipient. In this case, the credibility of the communicator plays a key role in persuasion. The third process pertains to the compliance of the recipient. The recipient is more compliant if he or she feels controlled by the communicator and/or the communicator can provide rewards and punishments. We focus on the first two processes.

Moderator. We anticipate that the attractiveness and the expertise of an avatar will have an influence on its persuasiveness and that the consumer's involvement with the purchase will moderate the influence of these characteristics. The expectation that the persuasiveness of different types of avatars will vary with involvement is consistent with a long history of research on persuasion by human communicators (see Cooper and Croyle 1984; Wood 2000). For example, the attractiveness of a communicator has been shown to have a greater impact on persuasion at lower levels of involvement (Petty, Cacioppo, and Goldmann 1981), whereas the expertise of a communicator's message has been shown to have a greater impact on persuasion at higher levels of involvement (Petty, Cacioppo, and Heesacker 1981). The positive characteristics of the communicator can generalize to the products being promoted by these people (Caballero and Pride 1984).

The varied influence of communicator attractiveness and communicator expertise may generalize to avatar com-

**FIGURE 1
Predicted Relationships**



munications. At the lowest level of purchase involvement, there will be little difference between an attractive and an expert avatar because the communication agent and message are irrelevant to the consumer. An avatar's attractiveness will contribute to an avatar's persuasiveness as involvement increases from a low to a moderate level, but it will have less influence on persuasiveness as involvement increases from a moderate to a high level. An avatar's expertise, as exemplified in the message quality, will contribute to an avatar's persuasiveness as involvement increases from a low to a moderate to a high level. In summary, the influence of avatar attractiveness on persuasion is a log function of increasing involvement, whereas the influence of avatar expertise on persuasion is a linear function of increasing involvement (see Figure 2). We expect that these different patterns of response to avatar attractiveness and expertise will allow an attractive avatar to be more persuasive at moderate levels of involvement and an expert avatar to be more persuasive at high levels of involvement. Formally,

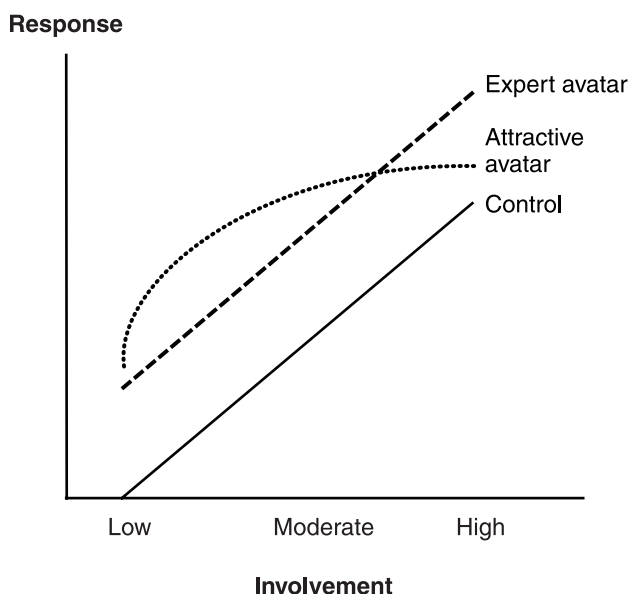
H₄: The influence of avatar attractiveness on persuasion is a log function of increasing involvement, whereas the influence of avatar expertise on persuasion is a linear function of increasing involvement.

H_{4a}: An attractive avatar will be more persuasive than an expert avatar at moderate levels of involvement.

H_{4b}: An expert avatar will be more persuasive than an attractive avatar at high levels of involvement.

Mediators. Whereas H₃ discusses factors (e.g., entertainment value, information value) that might mediate the positive influence of having an avatar present on a Web site, H₄ hypothesizes that different types of avatars (e.g., attractive, expert) may be effective in different situations. It is

FIGURE 2
Predictions



also possible to speculate about processes that mediate the relative effectiveness of an attractive or expert avatar. For example, interactions with physically attractive people are pleasant and rewarding (Bull and Rumsey 1988). The pleasant feeling that results from an interaction with an attractive person, in turn, promotes the adoption of the communicator's behaviors and attitudes (Chaiken 1979; Dion, Berscheid, and Walster 1972; Joseph 1982; McGuire 1985). In addition, physically attractive people are perceived more favorably on traits typically associated with selling effectiveness (Reingen and Kernan 1993). Thus, the attractiveness of an avatar should influence the likeability of an avatar, and likeability should mediate the degree of persuasion.

H_{5a}: The likeability of the avatar mediates the persuasiveness of an attractive avatar relative to an unattractive avatar.

Similarly, the expertise of an avatar should influence perceptions of the credibility of the avatar, and credibility should mediate the degree of persuasion. For our purposes, it is important to note that particularly experienced or knowledgeable people are perceived as experts (Friedman and Friedman 1979; Stäudel 1987) and that expert communicators are perceived as more credible than nonexpert communicators (Brehm, Kassin, and Fein 2005; Hovland, Janis, and Kelley 1953; McGuire 1985). In general, research investigating source expertise in persuasive communications indicates that the source's perceived credibility has a positive impact on persuasion (Horai, Naccari, and Fatoullah 1974; Maddux and Rogers 1980; Mills and Harvey 1972). For example, the expertise of a corporate communication agent affects the perceived credibility of the communication (Freiden 1984; Rubin, Mager, and Friedman 1982) and the associated company (Stephens and Faranda 1993), as well as the acceptance of the message. To the extent that avatars persuade as human communicators do, we hypothesize similar mediation effects for avatars.

H_{5b}: The perceived credibility of the avatar mediates the persuasiveness of an expert avatar relative to a nonexpert avatar.

We summarize these relationships in Figure 1 under the heading "Influence of Type of Avatar."

Study 1

Study 1 explored the influence of avatars on consumer responses to Web-based merchandising. The purchase scenario was an opportunity to purchase a leisure shoe that could be customized by means of an online consultation. This online consultation was performed using a series of diagnostic screens that solicited the consumer to make product design decisions. The key manipulation was whether the consumer was led to believe that an impersonal software program or an avatar was soliciting information and design recommendations.

Design and Stimuli

The experiment was an avatar personification (between-subjects manipulation) × intrinsic involvement (measured variable) mixed design. The key manipulation was the per-

sonification of the avatar available to assist with the purchase (no avatar, attractive avatar, or expert avatar). We established the attractiveness and expertise of the avatars in three ways: appearance, credentials, and information (product positioning). We purposely aligned these three factors to create a consistent personification for the avatar.¹

Attractive avatar condition. We designed attractive avatars to appear younger, thinner, and more athletic (see Figure 3). The avatar introduced itself by saying, "Hello, my name is Kim (Tom). I have recently been employed as a shoe consultant. I have already gained preliminary knowledge about our popular, customizable shoe products. I can certainly help you find an attractive offer."² The avatar then began the consultation using a fashion-oriented statement that was consistent with the avatar's personification:

Did you know a person's outfit is judged, above all, by the shoes that he or she is wearing? And comfortable sports shoes are not seen as very stylish. It is too bad that most fashionable shoes look trendy but do not offer much comfort. Using our company, you can design the look of your shoe and make it exactly as you wish. In addition, we can custom-fit your size and design the shoe's features according to your needs.

The avatar was present on the remaining screens to assist in the purchase. When appropriate, we tailored the avatar's advice to be consistent with its personification (for a sample consultation from the attractive avatar condition, see Figure 3).

Expert avatar condition. We designed expert avatars to appear older and nonathletic, and they wore eyeglasses. The avatar introduced itself by saying, "Hello, my name is Dr. Anne Schneider (Dr. Norbert Oswald). I have been a podiatrist for over 10 years and I would like to competently inform and advise you about our products. Take advantage of my experience and let me show you how our ergonomic shoes can be useful to you." The avatar then began the consultation using a comfort-oriented statement that was consistent with the avatar's personification:

Every day, your feet are subjected to a great deal of strain, which all too often leads to discomfort. Fashionable shoes, unfortunately, are usually ergonomically unsatisfactory, and comfortable shoes often do not have the right look. Our medically tested shoes, on the other hand, can be specially made according to your needs regarding fit and features. Our shoes offer a healthy form and comfort. You can also choose your desired design.

¹In this design, we intentionally confound the avatar's appearance and credentials and the content of the consultation to create an avatar personification factor. Thus, we cannot assess the independent influence of an avatar's presence. In a follow-up study, we control for the content of the consultation and show the independent influence of the avatar.

²We included an avatar gender manipulation in the design because industry contacts believed that avatar gender was a relevant factor. Avatar gender did not exhibit a main effect or interact with the manipulated variables for any dependent measure. The stimulus materials were in German. The statements are translations of German text.

The avatar was present on the remaining screens, and we tailored its advice to be consistent with its personification.

No-avatar control. The no-avatar control condition did not contain an avatar; thus, there was no introductory salutation. There was an attempt to keep the consultation in the no-avatar control equivalent to the consultation in the avatar conditions. We accomplished this by emphasizing both fashion and comfort at the beginning of the consultation:

We are a company that offers customized leisure shoes. We will introduce our product idea on the following Web pages. When buying leisure shoes, customers can usually choose between trendy fashion shoes and comfortable sport shoes. Our shoes, however, can be individually made for each customer with regard to fit, features, and design.

The information provided during the consultation was a blend of fashion and comfort information.

Procedure

We conducted the online experiment using a population of German shoppers. We recruited the participants using various online and offline procedures. The final sample size was 400 consumers, 55% of whom were men and 45% of whom were women. The participants were between ages 17 and 74 years, and the median age was 24 years. Sixty-six percent of the participants were college graduates, implying a disproportionately high level of education relative to a representative sample of online consumers. In addition, the participants' experience with the Internet and online shopping was above average compared with published statistics about the average Internet user.

We began by recording demographic information. Next, we asked participants four questions about their use of sales associates when shopping. Then, participants saw an introduction to the experiment:

On the following pages, a company that sells leisure shoes will introduce its products to you. The unique feature of the shoes is that they can be customized with respect to fit, features, and design. Please be aware that these are not actual Web pages for an online store, but rather pages that have been specifically designed for this experiment. You can use these pages to learn about design options, to have an online consultation, and to calculate a price for your personalized shoes.

After the introduction, participants were greeted by the avatar if they were in an avatar condition, received the introductory statement consistent with their condition, and were taken through the customized shoe-shopping experience. During the customization process, the participant could select different visual and functional features to create a personalized shoe. Participants were asked to select a procedure for fitting, the outside shoe material, the inside shoe material, and the soles. The avatar consultant discussed how to make a specific design decision and provided a recommendation before each decision. After the consultation, a randomly generated price of \$92.40, \$94.40, or \$96.40 was provided. Within an avatar condition, the avatar used the same text and made the same recommendations for each participant. The participants were not required to follow the avatar's recommendations. The participants had the opportunity to recustomize the shoe at the end of the process

FIGURE 3
Study 1: Avatars and Sample Consultation

A: Avatar Types



Attractive



Attractive



Expert



Expert

B: Consultation Using Appearance-Oriented Product Positioning Text

Did you know that a person's outfit is judged, above all, based on the shoes that he or she is wearing? Too bad that most fashionable shoes look trendy but usually do not offer much comfort or features. And comfortable sports shoes are not seen as very stylish.

With our company you can decide the look of your shoe yourself, exactly the way you want it. In addition, the size will be individually specified and you can choose the features according to your needs.

Offer for Customized Shoe

Choose between

- customized women's shoes
- customized men's shoes

You can now begin configuring your desired shoe in the right window. All options are explained in more detail by clicking on the information button.

As a base model for you, we have designed a robust textile shoe in white with high quality basic features.

I recommend the Creative Design for you. My experiences with this design have been very convincing. It is very easy, fun, and the result is guaranteed to be unique.

Product Information

By clicking, select what interests you.

Fit

- by 3-D scan
- by self measurement

Outer material

- Leather
- Textile
- Flexible Heel
- Stabilization in Toe Area
- Creative Design

As inner material, you can choose between basic fabric and special, water-resistant membranes.

Everyone knows that the soles are important for the comfort of the shoe. I will therefore offer you some extra features in addition to our standard sole. As an active person, you should take a look at these options.

After you made your selections, I can gladly have a price calculated for you.

Product Information

Here you will find additional features.

Inner material

- Textile
- AquaFun - Membrane

Soles

- Silicon Absorption
- Ventilation
- DuoTrek Soles
- Heel Stabilization

Thanks to our online customization and a revolutionary production process, we can offer your customized shoes to you at a very attractive price-value relationship.

For the desired look of your shoes, more than 50 different designs, patterns and many colors are available to you, which can either be individually chosen or partially combined.

That, however, is no longer part of this experiment.

Result

The price for these shoes comes to \$ 95.

Delivery is free of charge.

Exchanges are free of charge within 14 days of purchase.

(thus the random assignment of price), though few chose to do so. The participants were not asked to make an actual purchase.

Participants then responded to a series of dependent measures. Participants reported their involvement with the shoe purchase, perceptions of avatar attractiveness and expertise, perceptions of the Web site's entertainment value and information value, perceptions of the Web site's graphic design, perceptions of avatar likeability and credibility, perceptions of retailer credibility, satisfaction with the retailer, attitude toward the product, and purchase intention. We measured all items with seven-point Likert scales, anchored by "completely disagree" and "completely agree." The individual items used to measure each construct and the Cronbach's alpha for each scale appear in Appendix A.

Tests of H_1 – H_3

H_1 : Avatar effects on satisfaction, attitude, and purchase intention. The means of the satisfaction-with-the-retailer, attitude-toward-the-product, and purchase-intention dependent variables appear in Table 1.³ As H_1 predicted, participants who saw an avatar were more satisfied with the retailer ($M = 3.91$) than those who did not see an avatar ($M = 3.41$; $F(1, 397) = 9.19, p < .01$), had a more favorable attitude toward the product ($M = 4.36$) than those who did not see an avatar ($M = 3.86$; $F(1, 397) = 7.31, p < .01$), and had a higher purchase intention ($M = 3.74$) than those who did not see an avatar ($M = 3.00$; $F(1, 397) = 9.16, p < .01$).

H_2 : Avatar effects on perception of the Web site. H_2 predicted that avatars would facilitate Web-based purchasing because they make the Web site seem more entertaining and informative. Participants who saw an avatar rated the Web site as more entertaining ($M_{\text{avatar}} = 4.22, M_{\text{no avatar}} = 3.55$; $F(1, 397) = 13.45, p < .01$) and informative ($M_{\text{avatar}} = 4.48, M_{\text{no avatar}} = 3.99$; $F(1, 397) = 9.12, p < .01$) than participants who did not see an avatar.

³The smaller cell sizes for the control group are a consequence of a communication problem with the Web site programmer. The programmer considered gender an experimental rather than a counterbalance factor; thus, the male avatar, female avatar, and control conditions have similar cell sizes.

H_3 : The mediating effects of Web site perception. H_3 predicted that the increase in the perceived entertainment value and information value of the Web site would mediate the influence of the avatar's presence on satisfaction with the retailer, attitude toward the product, and purchase intention. Evidence for complete mediation requires (1) an effect of the independent variable (i.e., avatar presence) on the dependent variable (i.e., satisfaction with the retailer, attitude toward the product, and purchase intention), (2) effects of the independent variable (i.e., avatar presence) on the mediators (i.e., entertainment, informativeness), and (3) a nonsignificant effect of the independent variable when the mediators and independent variable are regressed on the dependent variable (Baron and Kenny 1986). As we summarize in Table 2, the presence of an avatar significantly influenced satisfaction with the retailer ($t(398) = 3.03, p < .05$), attitude toward the product ($t(398) = 2.71, p < .05$), and purchase intention ($t(398) = 3.03, p < .05$). The presence of the avatar also influenced the entertainment value ($t(398) = 3.67, p < .05$) and the informativeness ($t(398) = 3.02, p < .05$) of the Web site. Finally, the inclusion of entertainment value and avatar presence in a regression made the avatar's presence a nonsignificant predictor of satisfaction with the retailer ($t(397) = 1.16, p > .05$), attitude toward the product ($t(397) = 1.14, p > .05$), and purchase intention ($t(397) = 1.52, p > .05$). Likewise, the inclusion of informativeness and avatar presence in a regression made the avatar's presence a nonsignificant predictor of satisfaction with the retailer ($t(397) = 1.39, p > .05$), attitude toward the product ($t(397) = 1.38, p > .05$), and purchase intention ($t(397) = 1.80, p > .05$). These tests provide evidence for mediation (Baron and Kenny 1986).

Tests of H_4 and H_5

We used the 322 participants in the attractive and expert avatar conditions to test H_4 and H_5 . The hypotheses address whether participants with different levels of involvement with the product being purchased were more responsive to an attractive or expert avatar. Given the continuous nature of the intrinsic involvement variable, we used ordinary least squares regression to test the hypotheses. We conducted follow-up tests of avatar effectiveness at different levels of involvement using an analysis of variance (ANOVA). We

TABLE 1
Study 1: Means

Dependent Measure	Avatar Condition		
	None (n = 78)	Attractive (n = 159)	Expert (n = 163)
Satisfaction with retailer	3.41	3.93	3.89
Attitude toward product	3.86	4.38	4.34
Purchase intention	3.00	3.86	3.60
Web site entertainment	3.55	4.28	4.16
Web site informativeness	3.99	4.44	4.51
Avatar attractiveness		2.91	2.29
Avatar expertise		4.15	4.72
Avatar likeability		4.24	4.09
Avatar credibility		3.78	4.34

TABLE 2
Study 1: Mediation Analysis for Effects of Avatar Presence

Test	Variables	t	p
A → C	Avatar → satisfaction with retailer	3.03	<.01
	Avatar → attitude toward product	2.71	<.01
	Avatar → purchase intention	3.03	<.01
A → B	Avatar → entertainment	3.67	<.01
	Avatar → informativeness	3.02	<.01
Mediation Tests for Entertainment			
A, B → C	Entertainment, Avatar → satisfaction with retailer	13.53 1.16	<.01 .25
	Entertainment, Avatar → attitude toward product	10.25 1.14	<.01 .26
	Entertainment, Avatar → purchase intention	10.01 1.52	<.01 .13
Mediation Tests for Informativeness			
A, B → C	Informativeness, Avatar → satisfaction with retailer	17.05 1.39	<.01 .17
	Informativeness, Avatar → attitude toward product	11.32 1.38	<.01 .17
	Informativeness, Avatar → purchase intention	10.48 1.80	<.01 .07

created the levels of involvement using a tertiary split of the self-reported involvement scores.

Manipulation check. We performed two types of manipulation checks. First, we confirmed that the avatar manipulations were effective. Participants perceived the attractive avatar ($M = 2.91$) as more attractive than the expert avatar ($M = 2.29$; $F(1, 319) = 17.55, p < .05$), and they perceived the expert avatar ($M = 4.72$) as more expert than the attractive avatar ($M = 4.15$; $F(1, 319) = 15.16, p < .05$). Second, we confirmed that involvement and type of avatar were orthogonal factors and thus could be used in the same regression analysis. The avatar manipulation did not influence the degree of involvement with the product ($M_{\text{no avatar}} = 3.82, M_{\text{attractive}} = 3.65, M_{\text{expert}} = 3.60$; $F(2, 397) = .73, p > .05$). In addition, the degree of involvement with the product did not interact with perceptions of the attractiveness of the attractive avatar ($F(1, 318) = .28, p > .05$) or perceptions of the expertise of the expert avatar ($F(1, 318) = .15, p > .05$).⁴

Review of hypotheses. We offered two general hypotheses about the effectiveness of different types of avatars. First, we predicted that the more attractive avatar would appeal to participants who were moderately interested in

custom-fit shoes (H_{4a}). The reason for this preference is that participants would perceive the avatar as more likeable (H_{5a}). Second, we predicted that the more expert avatar would appeal to participants who were highly interested in custom-fit shoes (H_{4b}). The reason for this preference is that participants would perceive the avatar as more credible (H_{5b}). This pattern of results required participants to be more sensitive to avatar attractiveness as involvement increased to a moderate level and more sensitive to avatar expertise as involvement increased to a high level. As we stated in H_4 , the response to the attractive avatar needed to show a quadratic form with increasing involvement, whereas the response to the expert avatar needed to show a linear form with increasing involvement (see Figure 2).

H₄: Satisfaction with the retailer. The first analysis investigated the type of avatar × involvement interaction for satisfaction with the retailer. Consistent with H_4 , there was a type of avatar × involvement interaction with a quadratic influence of involvement across the attractive and expert conditions ($F(1, 316) = 10.16, p < .05$).⁵ A review of the

⁴The test of the type of avatar × involvement interaction involved a comparison of a constrained model ($\hat{Y} = \alpha + \beta \times \text{TYPE} + \beta \times \text{INVOLVE}$) with an unconstrained model ($\hat{Y} = \alpha + \beta \times \text{TYPE} + \beta \times \text{INVOLVE1} + \beta \times \text{INVOLVE2}$), where TYPE was dummy-coded 0/1, INVOLVE was the involvement score, INVOLVE1 was the involvement scores for the attractive treatment group (zero otherwise), and INVOLVE2 was the involvement scores for the expert treatment group (zero otherwise).

⁵The test of the type of avatar × involvement interaction involved a comparison of a constrained model that required a natural log for involvement ($\hat{Y} = \alpha + \beta \times \text{TYPE} + \beta \times \text{INVOLVE1} + \beta \times \text{INVOLVE2} + \beta \times \ln[\text{INVOLVE}]$) with a less constrained model ($\hat{Y} = \alpha + \beta \times \text{TYPE} + \beta \times \text{INVOLVE1} + \beta \times \text{INVOLVE2} + \beta \times \ln(\text{INVOLVE1}) + \beta \times \ln[\text{INVOLVE2}]$), where TYPE was dummy-coded 0/1, INVOLVE was the involvement score, INVOLVE1 was the involvement scores for the attractive group (zero otherwise), and INVOLVE2 was the involvement scores for the expert group (zero otherwise). Note that there was no type of avatar × involvement interaction with a linear influence of involvement across the attractive and expert conditions ($F(1, 318) = .32, p > .05$).

beta coefficients showed a nonsignificant influence of the linear involvement term ($t(316) = -1.13, p > .05$) and a significant influence of the quadratic involvement term ($t(316) = -2.85, p < .05$) in the attractive avatar condition. There was a significant influence of the linear involvement term ($t(316) = 3.62, p < .05$) and a nonsignificant influence of the quadratic involvement term ($t(316) = -1.58, p > .05$) in the expert avatar condition.

To help illustrate this interaction, the data are shown using a tertiary split on the involvement independent variable (see Table 3). The data show that moderately involved participants were more satisfied with the retailer when they shopped using the attractive avatar, but highly involved participants were more satisfied when they shopped using the expert avatar. Although the regression analysis could not test these predictions at various levels of involvement, the tertiary grouping of participants by involvement level allowed for an ANOVA of simple effect tests, albeit with less power to detect a difference between the avatar conditions (MacCallum et al. 2002). The attractive avatar ($M = 3.10$) and expert avatar ($M = 3.11$) resulted in equivalent levels of satisfaction at low levels of involvement ($F(1, 316) = .01, p > .05$). The attractive avatar ($M = 4.35$) led to more satisfaction than the expert avatar ($M = 3.92$) for moderately involved participants ($F(1, 316) = 3.45, p < .05$).⁶ The expert avatar ($M = 4.85$) did not lead to more satisfaction than the attractive avatar ($M = 4.55$) for highly involved participants ($F(1, 316) = 1.86, p > .05$), though the means were consistent with predictions. In summary, the regression analysis provided support for H_4 , and the ANOVA provided support for H_{4a} but only directional support for H_{4b} .

H_4 : *Attitude toward the product.* Consistent with H_4 , there was a type of avatar \times involvement interaction for attitude toward the product with a quadratic influence of

⁶Given the directional hypotheses in the moderate- and high-involvement conditions, we used one-tailed tests.

involvement across the attractive and expert conditions ($F(1, 316) = 5.35, p < .05$).⁷ The beta coefficients showed a nonsignificant influence of the linear involvement term ($t(316) = -.58, p > .05$) and a significant influence of the quadratic involvement term ($t(316) = 2.83, p < .05$) in the attractive avatar condition. There was a significant influence of the linear involvement term ($t(316) = 3.62, p < .05$) and a nonsignificant influence of the quadratic involvement term ($t(316) = -.50, p > .05$) in the expert avatar condition.

Using the tertiary split on the involvement independent variable (see Table 3), the attractive avatar ($M = 3.37$) and the expert avatar ($M = 3.43$) resulted in an equivalent attitude toward the product at low levels of involvement ($F(1, 316) = .10, p > .05$). The attractive avatar ($M = 4.68$) led to a more positive attitude toward the product than the expert avatar ($M = 4.22$) for moderately involved participants ($F(1, 316) = 3.78, p < .05$). The expert avatar ($M = 5.64$) led to a marginally more positive attitude than the attractive avatar ($M = 5.28$) for highly involved participants ($F(1, 316) = 2.41, p = .06$). In summary, the regression analysis provided support for H_4 , and the ANOVA provided support for H_{4a} and marginal support for H_{4b} .

H_4 : *Purchase intention.* Consistent with H_4 , there was a type of avatar \times involvement interaction for purchase intention with a unique quadratic influence of involvement in the attractive and expert conditions ($F(1, 316) = 5.94, p < .05$).⁸ The beta coefficients showed a nonsignificant influence of

⁷Note that there was no type of avatar \times involvement interaction for attitude toward the product with a linear influence of involvement across the attractive and expert conditions ($F(1, 318) = .19, p > .05$).

⁸Note that there was no type of avatar \times involvement interaction for purchase intention with a linear influence of involvement across the attractive and expert conditions ($F(1, 318) = .95, p > .05$).

TABLE 3
Study 1: Means by Level of Involvement

Dependent Variable and Condition	n	Avatar		
		None	Attractive	Expert
Satisfaction with Retailer				
Low involvement	143	2.37	3.10	3.11
Moderate involvement	123	3.31	4.35	3.92
High involvement	134	4.16	4.55	4.85
All	400	3.41	3.93	3.89
Attitude Toward Product				
Low involvement	143	2.51	3.37	3.43
Moderate involvement	123	3.95	4.68	4.22
High involvement	134	4.68	5.28	5.64
All	400	3.86	4.38	4.34
Purchase Intention				
Low involvement	143	1.44	2.52	2.59
Moderate involvement	123	2.91	4.15	3.48
High involvement	134	4.07	4.61	5.02
All	400	3.00	3.86	3.60

the linear involvement term ($t(316) = -.09, p > .05$) and a significant influence of the quadratic involvement term ($t(316) = 2.01, p < .05$) in the attractive avatar condition. There was a significant influence of the linear involvement term ($t(316) = 3.76, p < .05$) and a nonsignificant influence of the quadratic involvement term ($t(316) = -1.41, p > .05$) in the expert avatar condition.

Using the tertiary split on the involvement independent variable (see Table 3), the attractive avatar ($M = 2.51$) and the expert avatar ($M = 2.59$) resulted in an equivalent purchase intention at low levels of involvement ($F(1, 316) = .07, p > .05$). The attractive avatar ($M = 5.15$) led to more positive purchase intentions than the expert avatar ($M = 3.41$) for moderately involved participants ($F(1, 316) = 5.46, p < .05$). The expert avatar ($M = 5.02$) led to a marginally more positive purchase intention than the attractive avatar ($M = 4.61$) for highly involved participants ($F(1, 316) = 2.21, p = .07$). Again, the regression analysis provided support for H_4 , and the ANOVA provided support for H_{4a} and marginal support for H_{4b} .

H_{5a} . H_{5a} predicted that avatar likeability would mediate the persuasiveness of the attractive avatar relative to the expert avatar. As the test of H_{4a} shows, the attractive avatar was more persuasive than the expert avatar at moderate levels of involvement. Thus, we used the 97 participants who viewed an avatar and were moderately involved in the product category in the mediation analysis. As we summarize in Table 4, the presence of an attractive, as opposed to an expert, avatar significantly influenced satisfaction with the retailer ($t(96) = 1.85, p = .07$), attitude toward the product ($t(96) = 2.12, p < .05$), and purchase intention ($t(96) = 2.16, p < .05$). The attractive avatar was more liked ($t(96) = 1.83,$

$p = .07$) but was not more credible ($t(96) = 1.34, p > .05$) than the expert avatar. Finally, the inclusion of likeability and type of avatar in a regression made the type of avatar a nonsignificant predictor of satisfaction with the retailer ($t(95) = 1.11, p > .05$), attitude toward the product ($t(95) = 1.54, p > .05$), and purchase intention ($t(96) = 1.62, p > .05$). Sobel tests showed that avatar likeability was only a partial mediator of the type of avatar effect. Table 3 also reports nonsignificant tests of avatar credibility as a mediator, as we expected.

H_{5b} . H_{5b} predicted that avatar credibility would mediate the persuasiveness of the expert avatar relative to the attractive avatar. As the test of H_{4b} shows, the expert avatar was marginally more persuasive than the attractive avatar at high levels of involvement. Thus, we used the 101 participants who viewed an avatar and were highly involved in the product category in the mediation analysis. As we summarize in Table 3, the presence of an expert, as opposed to an attractive, avatar did not influence satisfaction with the retailer ($t(100) = 1.56, p = .12$), influenced attitude toward the product ($t(100) = 1.96, p < .05$), and marginally influenced purchase intention ($t(100) = 1.69, p < .05$). The expert avatar was more credible ($t(100) = 3.96, p < .05$) but was not more liked ($t(100) = .79, p > .05$) than the attractive avatar. Finally, the inclusion of credibility and type of avatar in a regression made the type of avatar a nonsignificant predictor of satisfaction with the retailer ($t(99) = .30, p > .05$), attitude toward the product ($t(99) = .67, p > .05$), and purchase intention ($t(99) = .97, p > .05$). Sobel tests showed that avatar credibility was only a partial mediator of the type of avatar effect. Table 3 also reports nonsignificant tests of avatar likeability as a mediator, as we expected.

TABLE 4
Study 1: Mediation Analysis for Effects of Avatar Type

Test	Variables	Moderate Involvement			High Involvement		
		Predicted	t	p	Predicted	t	p
A → C	Type of avatar → satisfaction with retailer	Significant	1.85	.07	Significant	1.56	.12
	Type of avatar → attitude toward product	Significant	2.12	.04	Significant	1.96	.05
	Type of avatar → purchase intention	Significant	2.16	.03	Significant	1.69	.09
A → B	Type of avatar → likeability	Significant	1.83	.07	n.s.	.79	.43
	Type of avatar → credibility	n.s.	1.34	.17	Significant	3.96	.00
Mediation Tests for Likeability							
A, B → C	Likeability,	Significant	5.09	.00	None	4.39	.00
	Type of avatar → satisfaction with retailer	n.s.	1.11	.27	Significant	1.35	.18
	Likeability,	Significant	3.60	.01	None	2.90	.01
	Type of avatar → attitude toward product	n.s.	1.54	.13	Significant	1.79	.08
	Likeability,	Significant	3.27	.00	None	1.72	.09
	Type of avatar → purchase intention	n.s.	1.62	.11	Significant	1.59	.17
Mediation Tests for Credibility							
A, B → C	Credibility,	None	5.33	.00	Significant	3.34	.00
	Type of avatar → satisfaction with retailer	Significant	2.83	.01	n.s.	.30	.76
	Credibility,	None	3.02	.00	Significant	3.37	.00
	Type of avatar → attitude toward product	Significant	2.61	.01	n.s.	.67	.54
	Credibility,	None	2.97	.00	Significant	1.69	.10
	Type of avatar → purchase intention	Significant	2.64	.01	n.s.	.97	.33

Notes: n.s. = not significant.

Discussion

Study 1 provides three compelling results. First, the simple inclusion of an avatar on the screens of a Web-based shopping site increased consumer satisfaction with the retailer, made the customer's attitude toward the product more favorable, and increased the customer's purchase intention (H_1). Second, the perceived entertainment value and informativeness of the Web site mediated the influence of the avatars on the key dependent measures (H_2 and H_3). Third, the responsiveness to a particular type of avatar depended on the type of avatar and the consumer's involvement with the product category (H_4). Attractive avatars were more persuasive when consumers were moderately involved in the purchase (H_{4a}), whereas expert avatars were marginally more persuasive when consumers were highly involved in the purchase (H_{4b}). These results are consistent with many empirical results showing that differential characteristics of persuasion agents are effective at different levels of customer involvement with the purchase.

There are two unresolved issues in the results of Study 1. First, our effort to personify the avatars using an externally valid procedure allows for an alternative explanation of the avatar effects (e.g., H_1 – H_3) observed in Study 1. It may be that the consultation in the no-avatar condition was of poorer quality than the consultations in the avatar conditions. Recall that the consultation in the no-avatar condition was a combination of fashion and comfort statements, whereas the consultation in the attractive (expert) avatar condition was fashion oriented (comfort oriented). To address this problem, we replicated Study 1 using an avatar type (no avatar, attractive avatar, or expert avatar) \times consultation type (fashion, comfort, or fashion and comfort) design. We randomly assigned 659 participants to one of the nine conditions. The results of this follow-up study replicated all the avatar-presence results (i.e., H_1 and H_2) and the mediation analysis results (H_3) of Study 1.⁹ More important, there was no interaction of the consultation type with the avatar type on any of the dependent measures. Thus, it appears that the avatar and its credentials, not the content of the consultation, are responsible for the effects we observed in Study 1.

The second issue pertains to the source of the involvement effects (H_4 and H_5) observed in Study 1. The data show that attractive avatars are more persuasive than expert avatars at moderate levels of involvement and that expert avatars are more persuasive than attractive avatars at high levels of involvement (H_{4a} and H_{4b}). Yet likeability only partially mediates the type of avatar effect at moderate levels of involvement, and credibility only partially mediates the type of avatar effect at high levels of involvement (H_5). We expect that there are two reasons for partial mediation. First, the effects of attractiveness and expertise at their respective levels of involvement are modest (i.e., p values range from .03 to .12). If a relationship between an independent and a dependent variable is modest, the ability of a mediator to explain this relationship is limited. A solution to this problem may be to increase the statistical power of the

test. Power ranged from .32 to .57 in the tests of H_{4a} and H_{4b} , well below the recommended levels of .80. Second, the manipulations of attractiveness and expertise were not independent in Study 1. Although this did not create a problem for testing H_1 – H_3 , in which we treated avatars as replicates, it may have caused a problem for testing H_5 . For example, at moderate levels of involvement, participants perceived an attractive avatar as more attractive than an expert avatar but also as less credible than an expert avatar. This means that the likeability score for the attractive avatar could be influenced in opposite directions by attractiveness and expertise (i.e., the likeability score could be biased downward). Consequently, the mediation tests involving likeability could have been compromised. A similar phenomenon could have biased the credibility ratings of the expert avatar, compromising the mediation tests involving credibility. Study 2 investigates H_4 and H_5 using an experimental design that controls for these potential biases.

Study 2

Study 2 investigated the influence of avatar attractiveness and avatar expertise on persuasion at different levels of intrinsic involvement with a product. The experiment used a level-of-attractiveness (low and high) \times level-of-expertise (low and high) factorial design along with a measure of the consumer's intrinsic involvement with the product. We expected that increases in avatar attractiveness would be most effective for moderately involved consumers and that the degree of persuasion would be mediated by the likeability of the avatar. Similarly, we expected that increases in avatar expertise would be most effective for highly involved consumers and that the degree of persuasion would be mediated by the credibility of the avatar.

Stimuli and Procedure

The stimuli and procedure were similar to Study 1. The primary changes involved orthogonal manipulations of avatar attractiveness and avatar expertise. For example, one possibility was to attempt to draw avatars that would be perceived as low on both factors, high on both factors, or a mix of levels across the factors. Pretests revealed that it was difficult to draw avatars that unambiguously fit these four profiles. Thus, we decided to manipulate avatar attractiveness using the avatar's visual features and avatar expertise using the avatar's credentials and style of consultation. First, we redesigned the female avatars to create a stronger manipulation of attractiveness.¹⁰ Second, we rewrote the consultation to be consistent with a low-expertise or high-expertise consultant (see Appendix B). In summary, the experiment was an attractiveness (low and high) \times expertise (low and high) between-subjects design. In all other respects, the procedure was identical to Study 1.

¹⁰We used only female avatars in this study because of (1) the lack of a gender effect in Study 1 and (2) the expense associated with redesigning the avatars.

⁹The results are available from the second author.

Results

We recruited participants from a population of German online shoppers. The final sample size was 596 consumers, 48.2% of whom were men and 51.8% of whom were women. The participants were between 14 and 80 years of age, and the median age was 28 years.¹¹ Seventy-four percent of the participants were college graduates, and the participants' experience with online shopping was above average compared with the average Internet user.

Manipulation check. We performed two types of manipulation checks. First, we confirmed that the manipulations were effective. Participants perceived the attractive avatar ($M = 4.07$) as more attractive than the unattractive avatar ($M = 2.06$; $F(1, 592) = 465.05, p < .01$), and they perceived the expert avatar ($M = 4.65$) as more expert than the nonexpert avatar ($M = 3.43$; $F(1, 592) = 118.23, p < .01$). Second, we confirmed that involvement was orthogonal to the experimental manipulations; thus, both factors could be used in the same regression analysis. The avatar attractiveness manipulation influenced the degree of involvement with the product ($M_{\text{attractive}} = 3.54, M_{\text{unattractive}} = 3.29$; $F(1, 592) = 4.57, p < .05$), but this effect was small compared with the variability in involvement (i.e., less than 2%). The avatar expertise manipulation did not influence the degree of involvement with the product ($M_{\text{expert}} = 3.41, M_{\text{nonexpert}} = 3.42$; $F(1, 592) = .04, p > .05$).

Review of hypotheses. We offered two general hypotheses about the effectiveness of different types of avatars. First, we expected that the more attractive avatar would appeal to participants who were moderately interested in custom-fit shoes (H_{4a}). The reason for this preference is that participants would perceive the avatar as more likeable (H_{5a}). Second, we expected that the more expert avatar would appeal to participants who were highly interested in

custom-fit shoes (H_{4b}). The reason for this preference is that participants would perceive the avatar as more credible (H_{5b}).

Initial analyses. Similar to Study 1, the initial analysis used regressions to test H_4 . We anticipated that the impact of the attractiveness manipulation would be greater for moderately involved consumers than for mildly or strongly involved consumers. Although the means were consistent with this prediction (see Table 5), tests for a quadratic influence of involvement across the two attractiveness conditions were not significant for satisfaction with the retailer ($t(591) = .76, p > .05$), attitude toward the product ($t(591) = 1.02, p > .05$), or purchase intention ($t(591) = .56, p > .05$).¹² In general, the attractiveness manipulation was so strong that it had an influence at all levels of involvement. We anticipated that the impact of the expertise manipulation would become greater as involvement increased. Tests for an expertise \times involvement interaction were significant for satisfaction with the retailer ($t(591) = 5.29, p < .01$), attitude toward the product ($t(591) = 3.70, p < .01$), and purchase intention ($t(591) = 3.87, p < .01$).

H_{4a} : Moderate involvement. H_{4a} predicted that at moderate levels of involvement, there would be a main effect for the attractiveness manipulation but not for the expertise manipulation. The data are shown using a tertiary split on the involvement independent variable (see Table 5). People who viewed an attractive avatar were more satisfied with the retailer ($M_{\text{attractive}} = 3.75$ [e.g., $M_s = 3.54$ and 3.96], $M_{\text{unattractive}} = 3.13$; $F(1, 590) = 18.58, p < .01$), had a more positive attitude toward the product ($M_{\text{attractive}} = 4.53, M_{\text{unattractive}} = 3.90$; $F(1, 590) = 18.57, p < .01$), and had a more positive purchase intention ($M_{\text{attractive}} = 3.58,$

¹¹The ten shoppers, ages 14–16, had Internet shopping experience, so we retained them in the sample.

¹²Note that the attractiveness manipulation shows a log relationship to involvement in the attractive–nonexpert condition. This condition is the conceptual equivalent of the attractive avatar condition in Study 1.

TABLE 5
Study 2: Means by Level of Involvement

Dependent Variable and Condition	n	Unattractive Nonexpert	Unattractive Expert	Attractive Nonexpert	Attractive Expert
Satisfaction with Retailer					
Low involvement	201	2.60	2.60	3.03	2.94
Moderate involvement	201	3.21	3.03	3.54	3.96
High involvement	194	3.37	4.23	3.82	4.82
All	596	3.03	3.23	3.51	3.93
Attitude Toward Product					
Low involvement	201	2.76	2.87	3.01	3.41
Moderate involvement	201	3.75	4.08	4.55	4.51
High involvement	194	4.72	5.16	4.86	5.42
All	596	3.67	3.95	4.27	4.47
Purchase Intention					
Low involvement	201	1.78	1.89	1.67	2.12
Moderate involvement	201	3.07	2.82	3.79	3.37
High involvement	194	4.00	4.22	4.09	4.95
All	596	2.87	2.89	3.36	3.53

$M_{\text{unattractive}} = 2.95$; $F(1, 590) = 12.74$, $p < .01$). People who viewed an expert avatar were not more satisfied with the retailer ($M_{\text{expert}} = 3.52$, $M_{\text{nonexpert}} = 3.36$; $F(1, 590) = 1.07$, $p > .05$), did not have a more positive attitude toward the product ($M_{\text{expert}} = 4.30$, $M_{\text{nonexpert}} = 4.13$; $F(1, 590) = 1.35$, $p > .05$), and did not have a more positive purchase intention ($M_{\text{expert}} = 3.11$, $M_{\text{nonexpert}} = 3.41$; $F(1, 590) = 2.79$, $p > .05$). The interaction between avatar attractiveness and expertise was not significant for retailer satisfaction ($F(1, 588) = 3.74$, $p > .05$), attitude toward the product ($F(1, 588) = 1.62$, $p > .05$), and purchase intention ($F(1, 588) = .27$, $p > .05$).

H_{5a}: Moderate involvement. H_{5a} predicted that avatar likeability would mediate the persuasiveness of the attractive avatar relative to the unattractive avatar. We used the 201 participants who were moderately involved in the product category in the mediation analysis. As we summarize in Table 6, the presence of an attractive, as opposed to an unattractive, avatar significantly influenced satisfaction with the retailer ($t(200) = 4.31$, $p < .01$), attitude toward the product ($t(200) = 4.31$, $p < .01$), and purchase intention ($t(200) = 3.57$, $p < .01$). The second test showed that the attractive avatar was more liked ($M = 4.73$) than the unattractive avatar ($M = 3.59$; $t(200) = 6.46$, $p < .01$). Finally, the inclusion of likeability and avatar attractiveness in a regression equation made the type of avatar a nonsignificant predictor of satisfaction with the retailer ($t(199) = 1.76$, $p > .05$) and attitude toward the product ($t(199) = 1.82$, $p > .05$), whereas purchase intention remained significant ($t(199) = 2.38$, $p < .05$). Sobel tests showed that avatar likeability was a significant mediator of avatar attractiveness for satisfaction with

the retailer ($t(199) = 4.32$, $p < .01$), attitude toward the product ($t(199) = 4.32$, $p < .01$), and purchase intention ($t(199) = 2.05$, $p < .05$).

H_{4b}: High involvement. H_{4b} predicted that at high levels of involvement, there would be a main effect for the expertise manipulation but not for the attractiveness manipulation. The data are shown using a tertiary split on the involvement independent variable (see Table 5). People who viewed an expert avatar were more satisfied with the retailer ($M_{\text{expert}} = 4.56$, $M_{\text{nonexpert}} = 3.60$; $F(1, 590) = 18.69$, $p < .05$), had a more positive attitude toward the product ($M_{\text{expert}} = 5.30$, $M_{\text{nonexpert}} = 4.79$; $F(1, 590) = 11.76$, $p < .05$), and had a more positive purchase intention ($M_{\text{expert}} = 4.63$, $M_{\text{nonexpert}} = 4.04$; $F(1, 590) = 7.08$, $p < .05$). People who viewed an attractive avatar were more satisfied with the retailer ($M_{\text{attractive}} = 4.37$, $M_{\text{unattractive}} = 3.80$; $F(1, 590) = 12.04$, $p < .01$), did not have a more positive attitude toward the product ($M_{\text{attractive}} = 5.17$, $M_{\text{unattractive}} = 4.94$; $F(1, 590) = 2.22$, $p > .05$), and had a more positive purchase intention ($M_{\text{attractive}} = 4.57$, $M_{\text{unattractive}} = 4.11$; $F(1, 590) = 4.29$, $p < .01$). The interaction between avatar attractiveness and expertise was not significant for retailer satisfaction ($F(1, 588) = .50$, $p > .05$), attitude toward the product ($F(1, 588) = .18$, $p > .05$), and purchase intention ($F(1, 588) = 3.65$, $p > .05$).

H_{5b}: High involvement. H_{5b} predicted that avatar credibility would mediate the persuasiveness of the expert avatar relative to the nonexpert avatar. We used the 194 participants who were highly involved in the product category in the mediation analysis. As we summarize in Table 6, the presence of an expert, as opposed to a nonexpert, avatar sig-

TABLE 6
Study 2: Mediation Analyses

Test	Variables	Moderate Involvement			High Involvement		
		Predicted	t	p	Predicted	t	p
Attractiveness Analysis							
A → C	Avatar attractiveness → satisfaction with retailer	Significant	4.31	.00	n.s.	3.47	.00
	Avatar attractiveness → attitude toward product	Significant	4.31	.00	n.s.	1.49	.14
	Avatar attractiveness → purchase intention	Significant	3.57	.01	n.s.	2.06	.04
A → B	Avatar attractiveness → likeability	Significant	6.46	.00	None	5.32	.00
A, B → C	Likeability,	Significant	5.99	.00	None	9.01	.53
	Avatar attractiveness → satisfaction with retailer	n.s.	1.76	.08	None	.63	.00
	Likeability,	Significant	5.81	.00	None	5.21	.00
	Avatar attractiveness → attitude toward product	n.s.	1.82	.07	None	.39	.70
	Likeability,	Significant	2.16	.03	None	4.66	.00
	Avatar attractiveness → purchase intention	n.s.	2.38	.02	None	.35	.74
Expertise Analysis							
A → C	Avatar expertise → satisfaction with retailer	n.s.	1.03	.31	Significant	6.22	.00
	Avatar expertise → attitude toward product	n.s.	1.16	.27	Significant	3.43	.00
	Avatar expertise → purchase intention	n.s.	1.67	.10	Significant	2.66	.00
A → B	Avatar expertise → credibility	None	3.33	.00	Significant	6.89	.00
A, B → C	Credibility,	None	6.81	.00	Significant	7.27	.00
	Avatar expertise → satisfaction with retailer	None	.45	.65	n.s.	3.04	.00
	Credibility,	None	6.06	.00	Significant	5.58	.00
	Avatar expertise → attitude toward product	None	.17	.87	n.s.	.83	.41
	Credibility,	None	2.72	.01	Significant	4.06	.00
	Avatar expertise → purchase intention	None	2.27	.02	n.s.	.68	.50

Notes: n.s. = not significant.

nificantly influenced satisfaction with the retailer ($t(193) = 6.22, p < .01$), attitude toward the product ($t(193) = 3.43, p < .01$), and purchase intention ($t(193) = 2.66, p < .01$). The second test showed that the expert avatar was more credible ($M = 4.65$) than the nonexpert avatar ($M = 3.37$; $t(193) = 6.89, p < .01$). Finally, the inclusion of expertise and avatar credibility in a regression equation made the type of avatar a nonsignificant predictor of attitude toward the product ($t(192) = .83, p > .05$) and purchase intention ($t(192) = .68, p > .05$), whereas satisfaction with the retailer remained significant ($t(193) = 3.04, p > .05$). Sobel tests showed that avatar credibility was a significant mediator of avatar expertise for satisfaction with the retailer ($t(193) = 5.01, p < .01$), attitude toward the product ($t(193) = 4.34, p < .01$), and purchase intention ($t(193) = 3.51, p < .01$).

Discussion

In general, the results of Study 2 are consistent with H_4 and H_5 . At moderate levels of involvement with the product purchase, participants were sensitive to the attractiveness of the avatar but not to the expertise of the avatar. The likeability of the avatar mediated the influence of avatar attractiveness on satisfaction with the retailer, attitude toward the product, and purchase intention. At high levels of involvement with the product purchase, participants were sensitive to the expertise of the avatar. The perceived credibility of the avatar mediated the influence of avatar expertise on satisfaction with the retailer, attitude toward the product, and purchase intention. Unexpectedly, there was a consequence of avatar attractiveness at high levels of involvement. This effect may be an influence of the strong manipulation of avatar attractiveness.

General Discussion

The two studies suggest that avatars can enhance the effectiveness of a Web-based sales channel. Study 1 showed that adding an avatar to Web-based information increased the customer's satisfaction with the retailer, attitude toward the product, and purchase intention. A follow-up study showed that the response to the avatar was robust across different types of information content. The avatar itself, not the information provided by the avatar, was the key to persuasion. Study 2 showed that active attempts to manipulate the attractiveness and expertise of the avatar made the avatar more persuasive for certain segments of shoppers. In general, making the avatar more attractive was effective across all levels of involvement. Making the avatar more expert was effective only at high levels of involvement. Study 2 also provided evidence of mediation. The attractiveness of the avatar influenced perceptions of likeability, and likeability mediated the influence of the avatar's attractiveness on persuasion. Similarly, the expertise of the avatar influenced perceptions of credibility, and credibility mediated the influence of the avatar's expertise on persuasion.

The results raise questions about persuasion in a Web-based environment. People are often aware of attempts at persuasion and have developed several strategies for resisting persuasion (Jacks and Cameron 2003; Knowles and Linn 2004). First, when people identify an attempt at per-

suasion, they can discount the message (Gruder et al. 1978) or derogate the source (Tannenbaum, Macauley, and Norris 1966; Zuwerink and Devine 1996). Second, people can use selective attention to attitude-congruent information or selective avoidance of attitude-incongruent information (Albarracín and Mitchell 2004). Third, people can have negative affective responses (e.g., irritation, anger) when exposed to a persuasive message, which leads to the rejection of the message (Zuwerink and Devine 1996). Fourth, people can actively look for a fault in the persuasive message and generate counterarguments (Brock 1967; Killeya and Johnson 1998). Finally, people can bolster their own attitude by selectively generating or recalling information in support of their own viewpoint (Lewan and Stotland 1961; Lydon, Zanna, and Ross 1988). These latter two strategies are likely to produce enduring resistance. However, they require cognitive resources and motivation.

Our two studies show that avatars can be effective instruments of persuasion, but further research needs to be conducted to answer the following questions: (1) To what extent do avatars have the potential to evade the common strategies consumers use to resist persuasive messages? and (2) What factors support consumer acceptance of avatars as helpful sales agents? In particular, two classes of factors should be taken into consideration. First, there are many options for the design of virtual characters in Web-based environment in terms of function, graphic design, and technical organization. It is likely that the persuasive power of avatars varies significantly, depending on whether avatars deliver a testimonial or act as representatives of the company, whether avatars are designed as more or less lifelike, and whether avatars provide one-way or reciprocal conversation. Second, recipient characteristics influence persuasion. That is, different people have different motivations and abilities to process information and to resist persuasion.

Finally, five research issues need discussion. First, in our procedure, we did not collect sales response data. Ideally, an investigation into avatar effectiveness would create a Web site with an avatar and a Web site without an avatar and show that sales are higher on an avatar-accompanied Web site. Second, we generated the results using a single product category in which a consultation was beneficial. We expect that the influence of an avatar will decline as the purchase process becomes easier, the product becomes simpler, and the buyer's knowledge of the product increases. Third, it could be argued that the avatar effects were novelty effects because few respondents had experienced avatar-accompanied Web sites. This may be true, but it is also the case that avatars varied in their effectiveness as a result of different levels of involvement. This interaction is inconsistent with a simple novelty effect. Fourth, we expect that avatars are effective because they enhance perceptions of reciprocal communication. Although our avatars engaged shoppers by taking turns conversationally with them, the exchange fell short of a truly reciprocal communication in which participants respond to the idiosyncratic conversation of their partner. Fifth, it could be argued that the results show no incremental conceptual insight relative to the existing literature on sales force effectiveness. However, if this premise is accepted, it must also be acknowledged that

avatars may have many of the same benefits as human sales agents. This was the goal of the article.

Appendix A Questionnaire Items

Product Involvement ($\alpha = .90$)

- “For me, customized leisure shoes are (important) (fun) (exciting) (relevant).”

Avatar Attractiveness ($\alpha = .90$)

- “In my opinion, the virtual consultant is (attractive) (beautiful) (good looking).”

Avatar Expertise ($\alpha = .93$)

- “In my opinion, the virtual consultant is (trained) (experienced) (knowledgeable).”

Entertainment Value of the Web Site ($\alpha = .93$)

In your opinion, to what extent do the following statements about the content and design of the Web-site apply to you?

- “I find the Web-site entertaining.”
- “I like the Web-site.”
- “The Web-site is fun to use.”

Information Value of the Web Site ($\alpha = .85$)

In your opinion, to what extent do the following statements about the content and design of the Web-site apply to you?

- “The information offered is useful.”
- “The information offered is understandable.”
- “The information offered is sufficient.”

Avatar Likeability ($\alpha = .89$)

- “In my opinion, the virtual consultant is (likeable) (friendly) (agreeable).”

Avatar Credibility ($\alpha = .94$)

- “In my opinion, the virtual consultant is (sincere) (competent) (credible).”

Satisfaction with the Retailer ($\alpha = .94$)

“Considering everything that I have learned so far about the company and its products, my opinion is that”

- “The company fulfills my needs.”
- “It would be advantageous for me to buy products from this company.”
- “I am delighted about the company and its products.”
- “I am satisfied with the company.”

Attitude Toward the Product ($\alpha = .94$)

- “I find the company’s customized leisure shoes (useful) (agreeable) (favorable) (good).”

Intention to Buy ($\alpha = .95$)

- “I can imagine buying a pair of customized leisure shoes from this company.”
- “The next time I buy a pair of leisure shoes, I will take this company into consideration and have them make me an offer.”
- “I am very interested in buying a pair of customized leisure shoes from this company.”

Appendix B¹³

Low-Expertise Consultation

Introduction: Hi, my name is Kim. / I’m a new shoe salesperson and I am not yet very familiar with this merchandise. I can, however, tell you how to learn more about our awesome shoes. / Our shoes can be made exactly as you want them. The shoes will have just the right style and they will be comfortable. Your feet will feel wonderful in them. Find out more about the advantages of custom-made shoes.

Page 1: A person’s appearance makes a strong first impression. Therefore, the appearance of a shoe is often the most important factor in a shoe purchase. Unfortunately, stylish shoes are often uncomfortable. There’s nothing worse than sore feet at the end of a long day. We use a certain technique for custom-fit production so you can get shoes that feel great and look the way you want them to. / Are you looking for a women’s or men’s shoe?

Page 2: You can design your shoe by using the mouse to click on the right. Here is a quick tip. If there is something that you are unsure about, click on the “i” and an explanation will be provided. / To begin with, there is a shoe in white material that is already pretty well equipped. I recommend the Creative Design option for you, even though it can be a bit complicated if one is not a professional in using this design procedure. There are, after all, over 50 colors from which you can choose. Still, it’s fun and the result is sure to be a one-of-a-kind shoe. / You can use the Creative Design after you have selected all of the other options for your shoe.

Page 3: The inside of the shoe can be made either out of a basic fabric or out of a waterproof material. / The soles are important for the comfort of the shoe. Therefore, you can now choose some features to make the soles of your shoes even better. This is important for people that spend a lot of time on their feet. / After you made your selections, I can calculate a price for you.

Page 4: Thanks to our online store, I can offer your desired shoes at a very inexpensive price. / You have now completed the shoe consultation. We would like to ask you some questions about this experience.

High-Expertise Consultation

Introduction: Hello, my name is Dr. Anne Schneider. / I have a doctorate in sports science. I have been an orthopedist and podiatrist for over 15 years. I would like to offer you comprehensive advice about our innovative leisure shoes. / These shoes can be made according to your needs.

¹³A “/” represents a page break.

Our shoes provide optimal support to your feet and prevent back strain. Find out more about the advantages of custom-made shoes.

Page 1: The fit of a shoe is a very important factor when buying shoes. Every day, your feet are exposed to enormous strain, which all-too-often causes discomfort. Orthopedically defective shoes can cause idiopathic scoliosis as well as degenerative symptoms like arthritis. / Our shoes are custom-made using innovative technologies. They have been designed to provide optimal support to your foot structure and thus prevent discomfort. The design is also based on your preferences.

Page 2: You can design your shoe by using the mouse to click on the right. All options are explained by clicking on the info button "i". / As a base model, our experts have developed a textile shoe in white with a high-quality configuration. I recommend the 3-D Fit option for you. This

option guarantees that the shoe will fit optimally and offer maximum wearing comfort. These are essential prerequisites for healthy and relaxed walking.

Page 3: The material inside of the shoe can be made of a basic fabric or a special, water-resistant, high-tech membrane. / Because the quality of the soles determines the comfort and walking characteristics of the shoes, you can choose to upgrade to our high-quality standard sole. Silicon absorption, for example, reduces the incidence of back pain up to 20%. / After you made your selections, I will gladly calculate an exact price for your shoe.

Page 4: Thanks to our online customization and a revolutionary production process, I can offer you customized shoes at a very attractive price. / You have now completed the shoe consultation. We would like to ask you some questions about this experience.

REFERENCES

- Albarraçín, Dolores and Amy L. Mitchell (2004), "The Role of Defensive Confidence in Preference for Proattitudinal Information: How Believing That One Is Strong Can Sometimes Be a Defensive Weakness," *Personality and Social Psychology Bulletin*, 30 (December), 1565–84.
- Allen, Mike, Raymond W. Preiss, Barbara Mae Gayle, and Nancy A. Burrell (2002), *Interpersonal Communication Research: Advances Through Meta-Analysis*. Mahwah, NJ: Lawrence Erlbaum Associates.
- Bahorsky Russ, Jeffrey Graber, and Steve Mason (1988), *Official Internet Dictionary: A Comprehensive Reference for Professionals Reviews*. Portland: ABS Consulting.
- Barlow, Alexis K.J., Noreen Q. Siddiqui, and Mike Mannion (2004), "Development in Information and Communication Technologies for Retail Marketing Channels," *International Journal of Retail and Distribution Management*, 32 (March), 157–63.
- Baron, Reuben M. and David A. Kenny (1986), "The Moderator-Mediator Variable Distinction in Social Psychological Research: Conceptual, Strategic, and Statistical Considerations," *Journal of Personality and Social Psychology*, 51 (December), 1173–82.
- Brehm, Sharon S., Saul M. Kassin, and Steven Fein (2005), *Social Psychology*. Boston: Houghton Mifflin.
- Brock, Timothy C. (1967), "Communication Discrepancy and Intent to Persuade as Determinants of Counterargument Production," *Journal of Experimental Social Psychology*, 3 (3), 296–309.
- Brown, Steven and Douglas Stayman (1992), "Antecedents and Consequences of Attitude Toward the Ad: A Meta-Analysis," *Journal of Consumer Research*, 19 (June), 4–51.
- Bull, Ray and Nichola Rumsey (1988), *The Social Psychology of Facial Appearance*. New York: Springer.
- Caballero, Marjorie J. and William M. Pride (1984), "Selected Effects of Salesperson Sex and Attractiveness in Direct Mail Advertisements," *Journal of Marketing*, 48 (Winter), 94–100.
- Chaiken, Shelly (1979), "Communicator Physical Attractiveness and Persuasion," *Journal of Personality and Social Psychology*, 37 (August), 1387–97.
- Childers, Terry L., Christopher L. Carr, Joann Peck, and Stephen Carson (2001), "Hedonic and Utilitarian Motivations for Online Retail Shopping Behavior," *Journal of Retailing*, 77 (Winter), 511–35.
- Cooper, Joel and Robert T. Croyle (1984), "Attitudes and Attitude Change," *Annual Review of Psychology*, 35, 395–426.
- Dion, Kenneth K., Ellen Berscheid, and Elaine Walster (1972), "What Is Beautiful Is Good," *Journal of Personality and Social Psychology*, 24 (December), 285–90.
- Dykema, Evie B. (2000), "Online Retail's Ripple Effect," Research Report, Forrester Research Inc., Cambridge, MA (September 2000).
- Eighmey, John and Lola McCord (1998), "Adding Value in the Information Age: Uses and Gratifications of Sites on the World Wide Web," *Journal of Business Research*, 41 (March), 187–94.
- Freiden, Jon B. (1984), "Advertising Spokesperson Effects: An Examination of Endorser Type and Gender on Two Audiences," *Journal of Advertising Research*, 24 (October–November), 33–41.
- Friedman, Hershey H. and Linda Friedman (1979), "Endorser Effectiveness by Product Type," *Journal of Advertising Research*, 19 (October), 63–71.
- G&J Electronic Media Services (2001), *7th Wave of the GfK-Online-Monitor*. Hamburg: GfK Press.
- Gruder, Charles L., Thomas D. Cook, Karen M. Hennigan, Brian R. Flay, Cynthia Alessis, and Jerome Halamaj (1978), "Empirical Tests of the Absolute Sleeper Effect Predicted from the Discounting Cue Hypothesis," *Journal of Personality and Social Psychology*, 36 (October), 1061–1074.
- Halfhill, Tom R. (1996), "Agents and Avatars," *Byte*, 21 (February), 69–72.
- Horai, Joan M., Nicolas Naccari, and Elliott Fatoullah (1974), "The Effect of Expertise and Physical Attractiveness upon Opinion Agreement and Liking," *Sociometry*, 37 (December), 601–606.
- Horton, Donald and Richard R. Wohl (1956), "Mass Communication and Para-Social Interaction," *Psychiatry*, 19 (August), 215–29.
- Hovland, Carl I., Irving L. Janis, and Harold H. Kelley (1953), *Communication and Persuasion*. New Haven, CT: Yale University Press.
- Jacks, Julia Zuwerink and Kimberly A. Cameron (2003), "Strategies for Resisting Persuasion," *Basic and Applied Social Psychology*, 25 (June), 145–61.
- Joseph, W. Benoy (1982), "The Credibility of Physically Attractive Communicators: A Review," *Journal of Advertising*, 11 (3), 15–24.
- Katz, Elihu and Paul F. Lazarsfeld (1955), *Personal Influence*. New York: The Free Press.

- Kelman, Herbert C. (1961), "Processes of Opinion Change," *Public Opinion Quarterly*, 25 (Spring), 57–78.
- Killeya, Ley A. and Blair T. Johnson (1998), "Experimental Induction of Biased Systematic Processing: The Directed-Thought Technique," *Personality & Social Psychology Bulletin*, 24 (January), 17–33.
- Knowles, Eric S. and Jay A. Linn (2004), *Resistance and Persuasion*. Mahwah, NJ: Lawrence Erlbaum Associates.
- Korgaonkar, Pradeep K. and Lori D. Wolin (1999), "A Multivariate Analysis of Web Usage," *Journal of Advertising Research*, 3 (March–April), 53–68.
- Lewan, Paul C. and Ezra Stotland (1961), "The Effects of Prior Information on Susceptibility to an Emotional Appeal," *Journal of Abnormal and Social Psychology*, 62 (March), 450–53.
- Loos, Peter (2003), "Avatar," in *Lexikon Electronic Business*, Thomas Schildhauer, ed. Munich: Oldenbourg, 16–19.
- Lydou, John, Mark P. Zanna, and Michael Ross (1988), "Bolstering Attitudes by Autobiographical Recall: Attitude Persistence and Selective Memory," *Personality and Social Psychology Bulletin*, 14 (March), 78–86.
- MacCallum, Robert C., Shaobo Zhang, Kristopher J. Preacher, and Derek D. Rucker (2002), "On the Practice of Dichotomization of Quantitative Variables," *Psychological Methods*, 7 (March), 19–40.
- MacKenzie, Scott B. and Richard J. Lutz (1989), "An Empirical Examination of the Structural Antecedents of Attitude Toward the Ad in an Advertising Pretesting Context," *Journal of Marketing Research*, 53 (November), 48–65.
- , ———, and George E. Belch (1986), "The Role of Attitude Toward the Ad as a Mediator of Advertising Effectiveness: A Test of Competing Explanations," *Journal of Marketing Research*, 23 (May), 130–43.
- Maddux, James E. and Ronald W. Rogers (1980), "Effects of Source Expertness, Physical Attractiveness, and Supporting Arguments on Persuasion: A Case of Brains over Beauty," *Journal of Personality and Social Psychology*, 39 (August), 235–44.
- McGuire, William J. (1985), "Attitudes and Attitude Change," in *The Handbook of Social Psychology*, Vol. 2, Lindzey Gardner and Elliot Aronson, eds. New York: Knopf, 233–346.
- Mills, James and John Harvey (1972), "Opinion Change as a Function of When Information About the Communicator Is Received and Whether He Is Attractive or Expert," *Journal of Personality and Social Psychology*, 21 (January), 52–55.
- Moon, Youngme (2000), "Intimate Exchanges: Using Computers to Elicit Self-Disclosure from Consumers," *Journal of Consumer Research*, 26 (March), 323–39.
- (2003), "Don't Blame the Computer: When Self-Disclosure Moderates the Self-Serving Bias," *Journal of Consumer Psychology*, 13 (1–2), 125–37.
- Morkes, John, Hadyn K. Kernal, and Clifford I. Nass (1999), "Effects of Humor in Task-Oriented Human-Computer Interaction and Computer-Mediated Communication: A Direct Test of SRCT Theory," *Human-Computer Interaction*, 14 (4b), 395–435.
- Mummert & Partner (2001), "Virtuelle Assistenten: Geheimwaffe gegen Milliardenverluste im Internet," press release, (March 27), (accessed April 22, 2005), [available at www.news4press.net/presse/985726200694.php3].
- Nass, Clifford I., Matthew Lombard, Lisa Henriksen, and Jonathan S. Steur (1995a), "Anthropocentrism and Computers," *Behavior and Information Technology*, 14 (4), 229–38.
- , Youngme Moon, B.J. Fogg, Byron Reeves, and Chris Dryer (1995b), "Can Computers Be Human Personalities?" *International Journal of Human-Computer Studies*, 43 (August), 223–39.
- and Jonathan Steur (1993), "Voices, Boxes and Sources of Messages: Computers and Social Actors," *Human Communication Research*, 19 (June), 504–527.
- Nielsen/NetRatings (2005), "Online Retail Report Card: Highest Conversion Rates Amongst Non-Brick-and-Mortar Retailers, According to Nielsen/NetRatings Megaview Online Retail," press release, (April 7), (accessed April 22, 2005), [available at http://www.netratings.com/pr/pr_050407.pdf].
- Petty, Richard E., John T. Cacioppo, and Rachel Goldman (1981), "Personal Involvement as a Determinant of Argument-Based Persuasion," *Journal of Personality and Social Psychology*, 41 (November), 847–55.
- , ———, and Martin Heesacker (1981), "Effects of Rhetorical Questions on Persuasion: A Cognitive Response Analysis," *Journal of Personality and Social Psychology*, 40 (March), 432–40.
- Phillips, Fred, Andrew Donoho, William W. Mayberry, Walter Keep, John M. McCann, Karen Shapiro, and David Smith (1997), "Electronically Connecting Retailers and Customers: Interim Summary of Expert Roundtable," in *Electronic Marketing and the Consumer*, Robert A. Peterson, ed. Thousand Oaks, CA: Sage Publications, 101–122.
- Redmond, William H. (2002), "The Potential Impact of Artificial Shopping Agents in E-Commerce Markets," *Journal of Interactive Marketing*, 16 (December), 56–66.
- Reeves, Byron and Clifford I. Nass (1996), *The Media Equation: How People Treat Computers, Television, and New Media Like Real People and Places*. Cambridge, MA: Cambridge University Press.
- Reingen, Peter H. and Jerome B. Kernan (1993), "Social Perception and Interpersonal Influence: Some Consequences of the Physical Attractiveness Stereotype in a Personal Selling Setting," *Journal of Consumer Psychology*, 2 (1), 25–39.
- Reynolds, Kristy E. and Sharon E. Beatty (1999), "Customer Benefits and Company Consequences of Customer-Salesperson Relationships in Retailing," *Journal of Retailing*, 75 (Spring), 11–32.
- Rubin, Alan M., Elizabeth Perse, and Robert A. Powell (1985), "Loneliness, Parasocial Interaction, and Local Television News Viewing," *Human Communication Research*, 12 (Winter), 155–80.
- Rubin, Vicki, Carol Mager, and Hershey H. Friedman (1982), "Company President Versus Spokesperson in Television Commercials," *Journal of Advertising Research*, 22 (August–September), 31–33.
- Soldow, Gary F. and Gloria Penn Thomas (1984), "Relational Communication: Form Versus Content in the Sales Interaction," *Journal of Marketing*, 48 (Winter), 84–93.
- Stäudel, Thea (1987), *Problemlösen, Emotionen, Kompetenz: Die Überprüfung eines Integrativen Konstrukts*. Regensburg: Roderer.
- Stephens, Nancy and William T. Faranda (1993), "Using Employees as Advertising Spokespersons," *Journal of Services Marketing*, 7 (2), 36–46.
- Swaminathan, Vanitha, Elzbieta Lepkowska-White, and Bharat P. Rao (1999), "Browsers or Buyers in Cyberspace? An Investigation of Factors Influencing Electronic Exchange," *Journal of Computer-Mediated Communication*, 5 (December), (accessed April 22, 2005), [available at <http://jcmc.indiana.edu/vol5/issue2/swaminathan.htm>].
- Tannenbaum, Percy H., Jacqueline R. Macauley, and Eleanor L. Norris (1966), "Principle of Congruity and Reduction of Persuasion," *Journal of Personality and Social Psychology*, 3 (2), 233–38.
- Trogemann, Georg (2003), "Mit Hand und Fuß: Die Bedeutung der nonverbalen Kommunikation für die Emotionalisierung von Dialogführungssystemen," in *Avatare-Digitale Sprecher für Business und Marketing*, Christian Lindner, ed. Berlin: Springer, 267–90.
- U.S. Census Bureau (2005), "Retail 4Q, 2004 E-Commerce Report," *U.S. Census Bureau*, (accessed April 22, 2005), [available at <http://www.census.gov/mrts/www/ecom.html>].

- Webster, Frederick E. (1968), "Interpersonal Communication and Salesman Effectiveness," *Journal of Marketing*, 32 (July), 7-13.
- Weitz, Barton A., Harish Sujan, and Mita Sujan (1986), "Knowledge, Motivation, and Adaptive Behavior: A Framework for Improving Selling Effectiveness," *Journal of Marketing*, 50 (October), 174-91.
- Weizenbaum, Joseph (1976), *Computer Power and Human Reason. From Judgment to Calculation*. New York: Penguin.
- Williams, Ederyn (1977), "Experimental Comparisons of Face-to-Face and Mediated Communications," *Psychological Bulletin*, 84 (September), 963-76.
- Wood, Wendy (2000), "Attitude Change: Persuasion and Social Influence," *Annual Review of Psychology*, 51, 539-70.
- Zuwerink, Julia R. and Patricia G. Devine (1996), "Attitude Importance and Resistance to Persuasion: It's Not Just the Thought That Counts," *Journal of Personality and Social Psychology*, 70 (May), 931-44.