

Working Paper

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Interactive Brand Communication

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Index of Contents

Abstract	1
1. Introduction	2
2. Literature Review	4
<i>2.1 The Interactivity Construct</i>	<i>4</i>
<i>2.2 The Mental Imagery Construct</i>	<i>8</i>
<i>2.3 Hypotheses</i>	<i>9</i>
3. Method	11
<i>3.1 Design</i>	<i>11</i>
<i>3.2 Stimuli</i>	<i>12</i>
<i>3.3 Subjects and Procedure</i>	<i>13</i>
<i>3.4 Website Response Measures</i>	<i>14</i>
<i>3.5 Manipulation Checks</i>	<i>16</i>
4. Results	19
5. General Discussion	26
References	29

Abstract

The importance of imagery has been recognized in varying areas of marketing but hardly ever in Internet advertising research. Due to its attention attracting effect a positive impact of interactivity on imagery processing and the generation of mental imagery is to be expected. Results of the current study indicate that the use of interactivity in websites can increase users' imagery activity and different dimensions of mental imagery like vividness or complexity. Further, it is found that high interactive and imagery-strong websites can result in more favorable attitudes toward the site and the brand, and stronger behavioral intentions. Finally, implications for theory and Internet advertising practice are discussed.

1. Introduction

Especially since the hype of the Internet in the 1990s interactivity is emerging as a focus of advertising practitioners and researchers, because it is one main characteristic that distinguishes the Internet from traditional media. In traditional media, with mainly one-way communication processes, the audience consists of passive message receivers, while the Internet engages the audience in the (two-way) communication process. Its interactive nature gives users much more freedom in controlling the messages they receive and allows users to customize messages according to their own needs and wants (Liu and Shrum 2002).

In the same way as with interactivity, there is still considerable interest in mental imagery from varying areas of marketing such as consumer persuasion (Mani and MacInnis 2003). Mental imagery has the capability of being multi-sensory and thus can provide for multiple channels of information processing, which is believed to enhance advertising effectiveness (Lutz and Lutz 1978). Further, imagery has potential for high elaboration by drawing information stored in long-term memory into working memory, which is supposed to lead to greater communication effectiveness (MacInnis and Jaworski 1989). Finally, mental imagery also involves the activation of concrete representations of beliefs and feelings related to personal experience and thus it is of high personal relevance (MacInnis and Price 1987).

Up to now mental imagery hardly found any consideration in Internet advertising research. Especially the impact of different levels of interactivity (as well as different levels of multimedia) on imagery processing and mental imagery might be promising from Internet advertisers' point of view. By increasing the level of interactivity in websites, companies can lose some control within the Internet users communication experience (Bezjian-Avery, Calder, and Iacobucci 1998), which seems to be less desirable. But as we show in this article, a brand-focusing and imagery-evoking use of interactivity can also create more effective online advertisements.

Therefore we explore the strength of interactivity and imagery in detail. We first present a theoretical background why interactivity and imagery-strength of websites should affect advertising effectiveness. Then we describe an experiment designed to investigate direct and indirect (with imagery processing as a mediator

variable) effects of interactivity and imagery-strength on imagery activities and mental imagery as well as attitudinal and behavioral constructs, and report the results. Finally, we discuss implications and limitations of the experiment and suggest further topics of research in this area.

2. Literature Review

2.1 The Interactivity Construct

The considerable attention on Internet communication over the past few years led, among other things, to many different definitions and conceptualizations of interactivity (e.g., Blattberg and Deighton 1991; Steuer 1992; Hoffman and Novak 1996; Rafaeli and Sudweeks 1997; Ha and James 1998; Downes and McMillan 2000; Liu and Shrum 2002; Liu 2003). These definitions not only make it difficult to grasp the nature of interactivity (Ha and James 1998), but they also allow different approaches to structure this complex construct. For instance, Sohn, Leck-enby, and Jee (2003) distinguish between interactivity definitions that focus on the characteristics of the medium, on users' subjective perception of interactions or on characteristics of a message from an interpersonal communication perspective. Compared with this, Hoffman and Novak (1996) distinguish between person-interactivity (interpersonal perspective) that occurs between humans through a medium and machine-interactivity (mechanical perspective) that happens between humans and machines to access different contents. Especially with a view of the fast developing software robot technology (smart-bots are already part in numerous shopping websites, for example) this second approach does not seem to be very long-lasting. Therefore, and because almost all definitions have the multidimensionality of the construct in common, we focus here on different dimensions of interactivity, which should not only characterize human-machine interaction and its perception from an Internet users perspective, but human-human interactions as well.

Several researchers explicitly underline two-way communication abilities as one important dimension of interactivity (Williams, Rice, and Rogers 1988; Ha and James 1998; McMillan and Hwang 2002; Liu and Shrum 2002; Liu 2003). They point out that the Internet changes communication processes because it makes instant feedback possible. Internet users not only can communicate with a website owner, but with one another through chat rooms, newsgroups, instant messaging or discussion forums as well. From an advertisers' perspective, two-way communication on the Internet has numerous advantages compared to traditional media. This may be the possibility of online transactions without the help of other tools or media (Liu and Shrum 2002), an efficient customer service through direct customer feedback (Berthon, Holbrook, and Hulbert 2000) or the generation of positive word of mouth for a company in chat-rooms (Hoffman and Novak 2000).

Nevertheless, two-way communication processes are also imaginable without any level of interactivity. This occurs for example, when an Internet website has broken links and thus offers no feedback to the user or when it is made of flash-movies (similar to TV-spots) without any links or choices for the user except a “next” button. Because of this, two-way communication is an important precondition for interactivity, but from our point of views no dimension of the construct itself (see also Rafaeli 1988).

Range of Interaction. Steuer (1992) defines range of interaction as the number of possibilities for action at any given time. Following this definition, the more options a user has within a communication process the greater his/her control of the communication and the higher the probability of achieving his/her communication goals. But active control has numerous additional advantages.

Ariely (2000) observed that in goal-directed search conditions active control of information was associated with better memory and learning. If users constantly control their experiences, they need to focus their attention and need to be cognitively active. A direct result of this more cognitive involving experience induced by higher interactivity is better user learning on account of a deeper cognitive processing. Furthermore, active control makes information acquisition more effective, because it enables users to obtain information in a way most suitable to them.

To sum up one may say that interactivity has an attention attracting effect on Internet users which should lead to better information processing and better learning of the content of a high interactive in contrast to the content of a low interactive website. But this advantage of interactivity was reversed in Ariely’s study when demands on processing resources were high on account of difficult tasks the participants had to solve.

Sundar, Brown, and Kalyanaraman’s (1999) study support this negative effect of active control due to an extra effort needed to navigate through a highly interactive website. Participants in a moderate interactivity condition (with an extra information link) judged a political candidate to be more caring and more qualified than participants in the low (with no extra information link) or the high interactivity condition (with two additional information links that were layered).

In summary, a high interactive website with lots of options is more engaging and requires users’ closer attention and more cognitive processing than is needed for

low interactive websites. Websites with higher range of interaction should also lead to more imagery activities, better attitudes and behavioral intentions, but this advantage may reverse from a certain level of interactivity.

Responsiveness. Rafaeli and Sudweeks (1997) emphasize the importance of relatedness and relevancy in the concept of interactivity. Referring to their definition of interactivity, responsiveness describes the extent to which later messages in a sequence relate to earlier messages. This is similar to Deighton (1996) who underline the ability of the interactive medium Internet to address an individual more than once and in a way that takes into account his or her unique responses.

In their study, Cho and Leckenby (1999) found that higher responsiveness between a banner ad and its complementary website leads to higher perception of interactivity and as a result to more favorable attitudes toward and purchase intentions of the advertised brand. But as Liu and Shrum (2002) pointed out, a generalization of their results is problematic, because their interactivity scale contained user behavioral intention items such as “I would bookmark this site for future usage” and “I would be willing to provide my personal information for the advertiser”. Because of this, positive correlations especially with the dependent variable purchase intention are not very surprising.

It is to be supposed that, when Internet users are exposed to a website (or to special contents of it) through clicking on a hyperlink, they may have their own expectations about the contents of that website (or page). If the expected contents are not found, or the contents of the website are not related to the hyperlink users have clicked, they may not interact with it or may leave the website immediately. However, higher levels of responsiveness as one dimension of interactivity in websites should lead above all to more positive attitude and behavioral intentions.

Speed of Interaction. Rice and Williams (1984) suggested that media are interactive if they have the potential for immediate communication. With this in mind, speed of interaction can either be high, as in the case of real time communication (e.g., telephone conference) or low, as on a store-and-forward basis (e.g., e-mail communication). Thus, this dimension of interactivity refers to response time (Lombard and Snyder-Duch 2001). The response time of a communicator influences the perception of interactivity.

Dellaert and Kahn (1999) have shown that better response time of a website can result in higher user satisfaction. In their study participants viewed and evaluated an Internet magazine. For participants not being informed of possible time lags, delay had a negative influence on the evaluation of their experience. The negative affect generated from the waiting was transferred to the evaluation of the magazine itself. On the other hand, in the informed delay condition participants had expectations of delay. Therefore the actual lack of synchronicity became less salient perceptually. In summary, quick responses to users' actions and requests on a website reduce the frustration associated with waiting and feeling ignored. This should result in a more satisfying communication experience.

Several researchers have derived further dimensions of interactivity. Playfulness refers to the entertainment value of interactivity provided by interactive games and curiosity arousal devices (Ha and James 1998). Eighmey (1997) concluded that for success an interactive website has to combine both entertainment and information to add value perceived by users. From our point of view, playfulness strongly correlates with the three dimensions range of interaction, responsiveness and speed of interaction. Entertainment on a website which offers no active control, no direct responses and lots of waiting periods may be imaginable but not because of its interactivity strength.

Connectedness is the feeling of being linked to a world outside the specific website (Ha and James 1998). This can be created through hyperlinks to related topics, online chat-rooms, and discussion forums, for example. The consideration of connectedness in the conceptualization of interactivity seems to be problematic. A website with less interactive content and therefore a small averaged retention period would be judged interactive on account of many hyperlinks to other websites. Thus from our perspective, both dimensions are not essential for the understanding of the construct. Because of this, we will not consider them in our experiment.

However, range of interaction, responsiveness, and speed of interaction turn out to be key dimensions of the interactivity construct. Nevertheless, no researcher has manipulated all of them at the same time. On the contrary, as Liu and Shrum (2002) noted, manipulations and operationalizations of interactivity vary strongly from study to study. Thus, their findings are barely comparable. Different ways of implementing interactivity may have different effects on users. For instance, Coyle and Thorson (2001) manipulated interactivity by varying the number of clickable links on the first page of a website only, and their manipulations had no

impact on attitude toward the site and behavioral intentions. Compared with this, we will show that range of interaction may have several effects on users' cognitive processing, attitudes and behavioral intentions.

2.2 The Mental Imagery Construct

Mental imagery is defined as the representation of any sensory experience in working memory (MacInnis and Price 1987). Hence, various forms of mental imagery can be experienced, depending on stimuli represented by each of the five senses (Childers and Houston 1982). Visual mental imageries are seen as analog, quasi-pictorial representations of perceptual information (Paivio 1971, 1986; Kosslyn 1980). They can range from few simple and vague mental images to many complex and clear mental images.

Several studies have shown that mental imagery affect cognitive and affective responses to advertising including the recall of advertising messages, attitudes toward the ad and toward the brand as well as behavioral intentions (Babin and Burns 1997; Bone and Ellen 1990; Gregory, Cialdini, and Carpenter 1982; Kisielius and Sternthal 1984; McGill and Anand 1989; Mitchell 1986; Mitchell and Olson 1981; Rossiter and Percy 1980). It has been proven several times that imagery-eliciting stimuli result in superior recall and more positive attitudes toward the ad and the brand (see MacInnis and Price 1987 as well as Babin, Burns, and Biswas 1992 for a review). Furthermore, there is also some evidence of a positive relationship between imagery processing and behavioral intention (Gregory, Cialdini, and Carpenter 1982; McGill and Anand 1989; Bone and Ellen 1990).

In this connection vividness turned out as a main dimension of mental imagery. Childers, Houston, and Heckler (1985, p. 126) define vividness as "the clarity of the mental image an individual evoked." For example, Burns, Biswas, and Babin (1993) stated that attitude toward the brand increases with the vividness of mental imagery. Vivid visual imageries of brands can also influence pre- as well as post-consumption behavior (MacInnis and Price 1987).

Many imagery-eliciting strategies have been suggested, although results have not been consistent. For instance, Rossiter and Percy (1980) investigated the effects of concrete wording on recall and attitude. Further, instructions to imagine have been studied by various researchers lately by Babin and Burns (1997). Lutz und Lutz

(1977) looked at interactions between targets, Alesandrini and Sheikh (1983) as well as Rossiter and Percy (1983) investigated the effects of various types of pictures on recall and attitude. They found that concrete and realistic pictures are superior to abstract pictures (see also Mitchell and Olson 1981). We attempt to reprove their findings with imagery-strong and imagery-weak Internet websites. In our experiment we also try to show if the use of interactivity on websites may be another successful imagery-eliciting strategy for advertisers.

In recent studies, researchers have measured imagery processing with multi-item scales and demonstrated its mediating role between imagery-eliciting strategies and consequence variables (e.g., Unnava and Burnkrant 1991; Bone and Ellen 1992; Babin and Burns 1998; Miller, Hadjimarcou, and Miciak 2000). We will revise their findings and try to show that high interactive and imagery-strong websites will induce imagery processing that mediates users' mental imagery, attitudes and behavioral intentions.

2.3 Hypotheses

The underlying rationale described above give rise to hypotheses concerning the operation of imagery activities engendered by progressive levels of interactivity and imagery-strength of websites and mediating advertising consequences. Seven general hypotheses were derived:

- H1a: High interactive websites will stronger induce brand cognition than low interactive websites.
- H1b: Imagery-strong websites will stronger induce brand cognition than imagery-weak websites.
- H1c: High interactive websites will induce more positive, more brand focusing and more non-verbal associations by users than low interactive websites.
- H1d: Imagery-strong websites will induce more positive, more brand focusing and more non-verbal associations by users than imagery-weak websites.
- H2a: High interactive websites will induce imagery processing rather than low interactive websites.
- H2b: Imagery-strong websites will induce imagery processing rather than imagery-weak websites.

- H3a: High interactive websites will induce mental imagery rather than low interactive websites.
- H3b: Imagery-strong websites will induce mental imagery rather than imagery-weak websites.
- H4a: High interactive websites will stronger induce positive advertising consequences (A_{site} , A_{brand} , BI) than low interactive websites.
- H4b: Imagery-strong websites will stronger induce positive advertising consequences (A_{site} , A_{brand} , BI) than imagery-weak websites.
- H5: Imagery processing will mediate the effects of progressive levels of interactivity and imagery-strength of websites on the vividness of mental imagery and on advertising consequences.

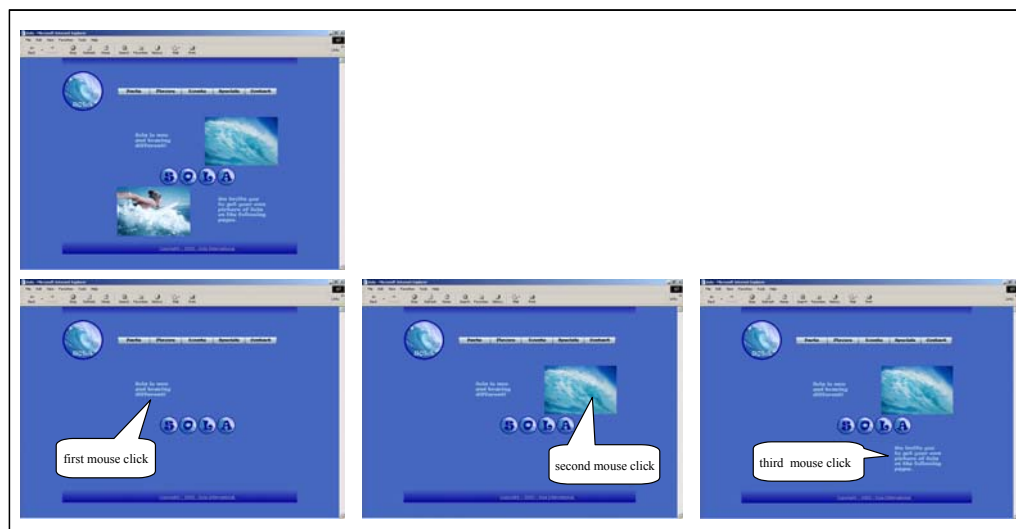
3. Method

3.1 Design

Two experimental factors (interactivity and strength of imagery of a website) were manipulated in a between-subjects design. There were two levels of interactivity (low and high) and two levels of imagery-strength (weak and strong). Thus, the experiment was a 2×2 mixed design with four cells (cell sizes were 10 subjects in the pretest and 40 in the main study).

Interactivity was operationalized using three dimensions: range of interaction, responsiveness and speed of interaction. Following Steuer's (1992) definition of range of interaction, this dimension of interactivity was manipulated by the number of clickable areas and the number of options within each area. In the low interactivity condition, users of the website had only nine clickable areas and only one option within the website. In the high interactivity condition, users had 32 clickable areas and four options within the website (see Figure 1a).

Figure 1a
Low interactive (top) and high interactive (bottom) versions of the SOLA website



Responsiveness is the relatedness of a message to earlier messages. Following Rafaeli and Sudweek's (1997) definition, responsiveness was manipulated by the number of unexpected and unrelated reactions on user clicks within the website. It was supposed that too much unrelated reactions on single clicks may raise users' attention and cognitive involvement during the surfing experience. Therefore, in

the low interactive condition, only two clickable areas of the website were linked with unrelated information. In the high interactive website, all clickable areas were linked with highly related information.

Speed of interaction refers to response time. The faster the response to user inputs the greater the perception of interactivity. With this in mind, speed of interaction was manipulated by time lags within the website. In the low interactivity condition, users had to wait two seconds before a new page appeared on mouse clicks. Our pretest has shown that two seconds were the maximum time participants accepted without breaking off their surfing activity. By surfing the low interactive website participants spent approximately 8 seconds by waiting and another 16 seconds by watching the SOLA print ads in a linear time flow. In the high interactive condition there was no waiting period at all, new pages appeared immediately on mouse clicks and the SOLA print ads were arranged as separately clickable areas on the website.

Strength of imagery was operationalized by the concreteness of the used pictures and logos within the website. Following Rossiter and Percy (1983), we define a concrete picture as a realistic reflection of the shown object, person or occasion, whereas an abstract picture has nothing or at least less in common with a real object, person or occasion. For example, a real photo of a surfer on an ocean wave is more concrete than a drawn cartoon of a surfer on an ocean wave (even though the cartoon must not be abstract). Because concrete pictures evoke mental imagery stronger than abstract pictures, we call a website with very concrete pictures and logos imagery-strong and, on the other hand, a website with less concrete pictures and logos imagery-weak. The pictures within the website contained mostly water or ocean elements. They were selected and revised in pairs whether they were concrete photos (for the imagery-strong condition) or unrealistic, basically more cartoon like (for the imagery-weak condition) but with absolutely identical contents (see Figure 1b).

3.2 Stimuli

Soft drinks were chosen as product category for the manipulated websites of the fictitious brand SOLA, because soft drinks are familiar to our mainly student sample. MacInnis and Price (1987) underline that a person must have adequate knowledge structures about a stimulus to be able to form mental imagery.

Four different versions of the same website have been developed for SOLA. It was positioned as a young, cool and fresh brand. The website was designed dominantly in blue; it consisted of 12 linked pages. The menu bar had five buttons to choose from (facts to SOLA, flavors of SOLA, events sponsored by SOLA, specials to SOLA and contact SOLA). Every page contained one or more pictures and some text elements, which all brought out the youthfulness and freshness of the SOLA brand.

Figure 1b
Imagery-weak (left) and imagery-strong (right) versions of the SOLA website



Regardless of the values of the independent variables, the amount of information in each of the four versions of the SOLA website was absolutely equal. They all contained identical information (size and length of text; wording; size, quantity and placing of pictures; etc.) besides the fact, that they were either low or high interactive and imagery-weak or imagery-strong, respectively.

3.3 Subjects and Procedure

200 people from a large German university participated in the study. 40 of them took part in the pretest to check the manipulations, 160 in the main experiment to

measure the effects on the dependent variables. To stimulate participation, each participant was entered in a lottery to win 25 €, 50 € and as first prize 100 € as incentive for completing the experiment, which took approximately 20 minutes.

Gender ratio was almost equal (48.0 percent female and 52.0 percent male), mean age of the sample came to 25.7 years ($sd=5.7$). On average, participants started using the internet in the middle of the year 1997, and spent averaged 9.98 hours per week ($sd=7.4$) on surfing the web.

Subjects were randomly assigned to explore one of the four versions of the SOLA website. For a more realistic surf experience, participants had to surf on websites of two competing brands out of the soft drink category, too. For this, the websites of Bluna and Sinalco, two well-known but hardly strong soft drink brands were chosen and slightly modified. Stronger brands would have possibly led to spill-over effects on the judgment of the unknown brand SOLA, which have to be avoided. The SOLA website was the second site to explore in all treatment conditions, but the order of Bluna and Sinalco as the first or third site was randomized.

For higher degree of control and internal validity, this experiment was conducted in a university lab. Participants were asked to follow the researcher in a computer equipped room. After a short introduction and the measurement of moderator variables on the computer, participants were instructed to spend exactly two minutes on each of the three website to explore and find out as much as they could about the three different brands. Two minutes were determined in the pretest to be a sufficient amount of time to become familiar with every four version of the SOLA website. After viewing the three websites for a total of six minutes, participants were answering questions regarding the SOLA website only. They were allowed to finish the measures and complete the experiment at their own pace.

3.4 Website Response Measures

Brand Cognition Measures. Immediately after examining the websites, subjects listed their cognitive responses to the SOLA site. Therefore a detailed imagery instruction was used stimulate participants associations to the fictitious brand. Two judges independently coded these thoughts into separate categories depending on whether the thought was focused on the SOLA brand or the product category, whether it was positive, negative, or neutral, and whether it was verbal, or non-verbal (predominantly visual). If both judges agreed on the category for a

response, it was assigned to that category. This procedure resulted in the successful coding of 97 percent of all associations.

Imagery Processing Measures. A two dimensional imagery processing scale, rather than a three (Babin and Burns 1998) or four (Miller, Hadjimarcou, and Miciak 2000) dimensional was used. The first dimension, imagery quantity referred to the number of images which came to mind while processing information (Paivio 1971; Kieras 1978; McGill and Anand 1989). It was directly measured through a seven-point semantic differential scale from “few pictures in mind” to “many pictures in mind”. The second dimension, imagery elaboration referred “to the activation of stored information in the production of mental images beyond what was provided by the stimulus” (Babin and Burns 1997, p. 37). It was assessed through three seven-point Likert scales from strong agreement (+3) to strong disagreement (-3) with the statements: “I fantasized about the product on the website,” “I imagined what it would be like to drink the product,” and “I imagined the taste of the product”. These three items were taken from Babin and Burns (1997, 1998) and were slightly modified for the soft drink product category. Cronbach’s alpha of the four-items imagery processing scale was .79.

Mental Imagery Measures. A four item scale was developed to measure different mental imagery dimensions of the brand SOLA: vividness, intensity, ease of generation, and complexity. Vividness of mental imagery is the clarity by which an individual experiences an image. It is by far the most prevalent characteristic of mental imagery (MacInnis and Price 1987). To index vividness of the mental imagery of SOLA, participants used two seven-point semantic differential scales from “vague” to “clear” as well as from “not vivid” to “vivid”. Cronbach’s alpha of the two-items scale came to .77. Several researchers have suggested ease of imagery generation as another important dimension of mental imagery (Paivio 1976; Unnava and Burnkrant 1991). Scales for ease of generation ranged from “easy” to “difficult”, and for intensity of the mental imagery from “weak” to “strong”. Complexity was also measured by a seven-point differential scale from “simple” to “complex”.

Attitude Measures. To measure attitude toward the site (A_{site}), participants evaluated the SOLA websites using seven-point Likert scales to indicate their strong agreement (+3) or strong disagreement (-3) with the following statements: “The website of SOLA makes it easy for me to build a relationship with the company,” “I would like to visit the website of SOLA again in the future,” “I’m satisfied with

the service provided by the website of SOLA,” “I feel comfortable in surfing the website of SOLA,” “I feel surfing the website of SOLA is a good way for me to spend my time”. To compare the website of SOLA with other websites participants used a seven-point Likert scale anchored by “One of the Worst” and “One of the Best”. Because of its Internet specific adjustment and the high reliability, this A_{site} scale was taken from Chen and Wells (1999), also tested by Chen, Clifford and Wells (2002). Cronbach’s alpha of the six-items scale was .88.

Following Hastak and Olson (1989) brand attitude (A_{brand}) was measured by asking subjects to indicate their overall evaluations of the SOLA brand using seven-point semantic differential scales: “I find it bad / I find it good,” “I dislike it / I like it,” and “It has likely a poor quality / It has likely a good quality”. Cronbach’s alpha for attitude toward the brand was .87.

Intention Measures. Two behavioral intention measures (BI) were used. To index purchase intention, participants used two seven-point semantic differential scales: “I wouldn’t buy SOLA / I would buy SOLA,” and “I wouldn’t prefer SOLA against other brands / I would prefer SOLA against other brands”. To measure intention to use the website, participants were given a seven-point semantic differential scale from “no, shorter” to “yes, longer” to indicate if they would have surfed the website of SOLA for more than the fixed two minutes. Finally, subjects had to indicate if they would subscribe to the newsletter of SOLA using a seven-point semantic differential scale from “no, I wouldn’t” to “yes, I would”. Cronbach’s alpha for the behavioral intention construct was .79.

3.5 Manipulation Checks

Manipulation Check Variables. A three item scale was developed to evaluate the interactivity manipulations based on the three dimensions previously identified: range of interaction, responsiveness, and speed of interaction. Participants used a seven-point semantic differential scale from “no, few” to “yes, many” to indicate the amount of click and selection possibilities they had on the SOLA website. The speed of reactions on user clicks was measured using a seven-point semantic differential scale from “slow reactions” to “fast reactions”. Finally, subjects had to indicate if they had expected the reactions on their clicks using a seven-point semantic differential scale from “no, never” to “yes, always”. Manipulation check of imagery-strength was also carried out with two seven point semantic differential

scales. Subjects had to indicate if they saw “few / many” and “realistic / unrealistic” pictures, logos and buttons on the SOLA website.

Pretest. The purpose of the pretest with 40 subjects was first to verify that the experimental procedure was understood well, that web server and database were responding in the intended way and that instructions and questions were clearly labeled and understandable. Second, the pretest was used to check the effectiveness of the manipulations for every level of interactivity and imagery-strength. To evaluate the manipulations separate one-way ANOVAs were conducted (see Table 1a). Participants exposed to imagery-strong websites rated them imagery-stronger ($M=4.53$) than participants exposed to imagery-weak websites ($M=3.53$) ($F[1,36]=5.77$, $p<.05$). Participants exposed to high interactive websites rated them more interactive ($M=4.83$) than participants exposed to low interactive websites ($M=4.25$) ($F[1,36]=3.25$, $p<.10$). For higher levels of control manipulation check variables were kept in the questionnaire when the experiment went into field. In the main experiment with 160 participants, interactivity manipulations ($M(\text{low})=4.10$, $M(\text{high})=4.86$, $F[1,156]=13.84$, $p<.001$) as well as manipulations of imagery-strength ($M(\text{weak})=3.21$, $M(\text{strong})=4.30$, $F[1,156]=36.14$, $p<.001$) were successful (see Table 1b). In conclusion, the manipulation checks showed that participants were able to perceive significant differences amongst all conditions.

Table 1a
Pretest Results of the Manipulation Check

	Means (sd)		ANOVA F-Values			
	Interactivity	Imagery-strength	df	Interactivity	df	Imagery-strength
Main Effects						
low interactive	4.25 (1.24)		1	3.25 ^a		
high interactive	4.83 (.75)					
imagery-weak		3,53 (1.52)			1	5.77 ^b
imagery-strong		4,53 (.99)				
Residual			36		36	

^a $p < .10$

^b $p < .05$

Table 1b
Main Experiment Results of the Manipulation Check

	Means (sd)		ANOVA F-Values			
	Interactivity	Imagery-strength	df	Interactivity	df	Imagery-strength
Main Effects						
low interactive	4.10 (1.29)		1	13.84 ^d		
high interactive	4.86 (1.31)					
imagery-weak		3,21 (1.10)			1	36,14 ^d
imagery-strong		4,30 (1.21)				
Residual			156		156	

^d p < .001

4. Results

For the measurement of brand cognition a total of 810 associations were coded and analyzed by separate ANOVAs. H1a proposed that high interactive websites will stronger induce brand cognition than low interactive websites. Results showed that the average amount of associations per user was higher (see Table 2) in the high interactive condition ($M(\text{high})=5.23$) than in the low interactive condition ($M(\text{low})=4.84$), but the difference between means was not significant ($F[1,156]=1.53, p>.10$). Similar to H1a, H1b stated that imagery-strong websites will stronger induce brand cognition than imagery-weak websites. In the imagery-strong condition the average amount of associations per user was higher ($M(\text{strong})=5.29$) than in the imagery-weak condition ($M(\text{weak})=4.84$), but the difference between means was not significant, too ($F[1,156]=1.53, p>.10$). In generally, we can say that H1a and H1b were not supported.

Table 2
Means and Standard Deviations (sd) for Effects of Interactivity and Imagery-Strength on the Dependent Variables

Dependent Variables	Treatments			
	Interactivity		Imagery-strength	
	<i>low</i>	<i>high</i>	<i>weak</i>	<i>strong</i>
Avg. Amount Assoc.	4.84 (2.36)	5.29 (2.24)	4.84 (2.31)	5.29 (2.29)
Avg. Brand Assoc.	1.69 (1.30)	3.08 (1.76)	2.04 (1.41)	2.73 (1.88)
Avg. Positive Assoc.	2.03 (1.26)	2.73 (1.53)	2.03 (1.23)	2.78 (1.56)
Avg. Non verbal Assoc.	3.13 (1.62)	3.39 (1.66)	3.00 (1.40)	3.52 (1.82)
Imagery Processing	3.17 (1.38)	3.52 (1.37)	2.98 (1.29)	3.71 (1.38)
Vividness of Mental	3.54 (1.51)	4.01 (1.46)	3.50 (1.42)	4.06 (1.53)
Intensity of MI	3.85 (1.52)	4.23 (1.53)	3.55 (1.56)	4.53 (1.34)
Complexity of MI	2.68 (1.24)	3.33 (1.39)	2.80 (1.40)	3.20 (1.28)
Ease of MI Generation	3.75 (1.81)	3.68 (1.69)	3.25 (1.56)	4.18 (1.81)
Attitude toward the Site	2.80 (1.16)	3.62 (1.21)	3.01 (1.26)	3.41 (1.21)
Attitude toward the	3.85 (1.13)	4.67 (1.18)	4.05 (1.27)	4.47 (1.14)
Behavioral Intention	2.51 (1.22)	3.12 (1.32)	2.74 (1.36)	2.89 (1.25)

H1c and H1d aimed at the quality, brand focus and non-verbal character of the given associations. Thus, H1c predicted that high interactive websites will induce

more positive, more brand focusing and more non-verbal associations by users than low interactive websites. MANOVA results indicated a main effect of interactivity on the three dependent variables (Wilks-lambda=.80, $F[3,131]=11.05$, $p<.001$) (see Table 3a). ANOVA results showed that interactivity led to significantly more brand focusing ($M(\text{low})=1.69$, $M(\text{high})=3.08$, $F[1,133]=29.08$, $p<.001$) as well as to significantly more positive associations per user ($M(\text{low})=2.03$, $M(\text{high})=2.73$, $F[1,133]=9.86$, $p<.01$). Moreover, in the high interactive condition the average amount of non-verbal associations was higher ($M(\text{high})=3.39$) than in the low interactive condition ($M(\text{low})=3.13$), even though difference between means was not significant ($F[1,133]=.40$, $p>.10$). Hence, H1c received partial support.

H1d proposed that imagery-strong websites will induce more positive, more brand focusing and more non-verbal associations by users than imagery-weak websites. MANOVA results showed a main effect of imagery-strength on the three dependent variables (Wilks-lambda=.89, $F[3,131]=5.21$, $p<.01$). ANOVA results indicated that imagery-strength had significant effects on the average amount of brand focusing associations ($M(\text{weak})=2.04$, $M(\text{strong})=2.73$, $F[1,133]=10.72$, $p<.001$) and on the average amount of positive associations per user ($M(\text{weak})=2.03$, $M(\text{strong})=2.78$, $F[1,133]=10.52$, $p<.001$). Likewise, in the imagery-strong condition the average amount of non-verbal associations was significantly higher ($M(\text{strong})=3.52$) than in the imagery-weak condition ($M(\text{weak})=3.00$) ($F[1,133]=6.66$, $p<.01$). Therefore H1d was supported.

H2a suggested that high interactive websites will induce imagery processing rather than low interactive websites. The ANOVA results indicated a marginally significant main effect of interactivity on imagery processing ($F[1,156]=2.81$, $p<.10$) (see Table 3b). Low versus high interactivity websites resulted in mean imagery processing scores of 3.17 versus 3.52. In addition, H2b stated that imagery-strong websites will induce imagery processing rather than imagery-weak websites. ANOVA results indicated that imagery-strength had significant effects on imagery processing ($M(\text{weak})=2.98$, $M(\text{strong})=3.71$, $F[1,156]=12.15$, $p<.001$). Thus, H2a and H2b were supported.

The next hypothesis H3a suggested that high interactive websites will induce mental imagery rather than low interactive websites. MANOVA results indicated a main effect of interactivity on the dependent variables (Wilks-lambda=.87, $F[4,153]=5.91$, $p<.001$). ANOVA results regarding the effects of interactivity on

different dimensions of mental imagery varied slightly (see Table 3c). Interactivity had significant main effects on vividness ($M(\text{low})=3.54$, $M(\text{high})=4.01$, $F[1,156]=4.12$, $p<.05$) and complexity of mental imagery ($M(\text{low})=2.68$, $M(\text{high})=3.33$, $F[1,156]=10.02$, $p<.01$) as well as marginally significant main effect on intensity ($M(\text{low})=3.85$, $M(\text{high})=4.23$, $F[1,156]=2.69$, $p<.10$). However, results regarding the effect of interactivity on ease of generation of mental imagery were not significant ($F[1,156]=.08$, $p>.10$), and contrary to what was expected ($M(\text{low})=3.75$, $M(\text{high})=3.68$). Thus, H3a received partial support. High interactive websites lead to more vivid, more intense and more complex mental imagery. But especially the increase of complexity might also lead to a difficulty of generation of mental imagery in users' mind.

H3b stated that imagery-strong websites will induce mental imagery rather than imagery-weak websites. MANOVA results indicated a main effect of imagery-strength on the dependent variables (Wilks-lambda=.84, $F[4,153]=7.35$, $p<.001$). The ANOVA results were very consistent here. Imagery-strength had highly significant effects on the intensity of mental imagery ($M(\text{weak})=3.55$, $M(\text{strong})=4.53$, $F[1,156]=18.2$, $p<.001$), and the ease of mental imagery generation ($M(\text{weak})=3.25$, $M(\text{strong})=4.18$, $F[1,156]=11.9$, $p<.001$). Results also indicated significant effects of imagery-strength on vividness ($M(\text{weak})=3.50$, $M(\text{strong})=4.06$, $F[1,156]=5.81$, $p<.05$) and complexity of mental imagery ($M(\text{weak})=2.80$, $M(\text{strong})=3.20$, $F[1,156]=3.80$, $p<.05$). Therefore H3b was supported; imagery-strong websites lead to stronger mental imagery than imagery-weak websites. No significant interaction effects emerged between interactivity and imagery-strength on the dependent imagery processing and mental imagery variables.

H4a and H4b stated that high interactive and imagery-strong websites will stronger induce advertising consequences than low interactive and imagery-weak websites. These hypotheses were tested by running a two-way MANOVA with mean scale values for the dependent variables A_{site} , A_{brand} and BI, and levels of interactivity and imagery-strength as independent variables (see Table 3d). Results indicated a main effect of interactivity on the three dependent variables (Wilks-lambda=.85, $F[3,154]=8.84$, $p<.001$) as well as a main effect of imagery-strength on the dependent variables (Wilks-lambda=.94, $F[3,154]=3.33$, $p<.05$). The ANOVA results showed highly significant main effects of interactivity on A_{site} ($M(\text{low})=2.80$, $M(\text{high})=3.62$, $F[1,156]=19.81$, $p<.001$), on A_{brand}

(M(low)=3.85, M(high)=4.67, $F[1,156]=20.65$, $p<.001$) and significant main effect on BI (M(low)=2.51, M(high)=3.12, $F[1,156]=9.25$, $p<.01$). Absolute differences between means were all significant and thus, H4a was supported.

Table 3a
Effects of Interactivity and Imagery-Strength on Brand Focus, Quality and Nonverbal Character of Brand Cognition

	MANOVA			ANOVA F-Values					
	df	Wilks	F-Values	df	Brand Focus	df	Quality	df	Non-verbal
Main Effects									
Interactivity (I)	3	.80	11.05 ^d	1	29.08 ^d	1	9.86 ^c	1	.40
Imagery-strength (Is)	3	.89	5.21 ^c	1	10.72 ^d	1	10.52 ^d	1	6.66 ^c
Interactions									
I x Is	3	.97	1.22	1	2.02	1	3.68 ^b	1	.07
Residual	131			133		133		133	

^b $p < .05$

^c $p < .01$

^d $p < .001$

Table 3b
Effects of Interactivity and Imagery-Strength on Brand Cognition and Imagery Processing

	ANOVA F-Values				
	df	Avg. Amount Associations		df	Imagery Processing
Main Effects					
Interactivity (I)	1	1.53		1	2.81 ^a
Imagery-strength (Is)	1	1.53		1	12.15 ^d
Interactions					
I x Is	1	.12		1	.10
Residual	156			156	

^a $p < .10$

^d $p < .001$

Table 3c
Effects of Interactivity and Imagery-Strength on Vividness, Intensity, Complexity and Ease of Generation of Mental Imagery

	MANOVA			ANOVA F-Values							
	df	Wilks	F-Values	df	Vivid.	df	Int.	df	Comp.	df	Ease
Main Effects											
Interactivity (I)	4	.87	5.91 ^d	1	4.12 ^b	1	2.69 ^a	1	10.02 ^c	1	.08
Imagery-strength (Is)	4	.84	7.35 ^d	1	5.81 ^b	1	18.2 ^d	1	3.80 ^b	1	11.9 ^d
Interactions											
I x Is	4	.96	1.78	1	1.23	1	.97	1	2.14	1	.08
Residual	1			1		1		1		1	

^a p < .10

^b p < .05

^c p < .01

^d p < .001

Table 3d
Effects of Interactivity and Imagery-Strength on A_{site}, A_{brand}, and BI

	MANOVA			ANOVA F-Values					
	df	Wilks	F-Values	df	A _{site}	df	A _{brand}	df	BI
Main Effects									
Interactivity (I)	3	.85	8.84 ^d	1	19.81 ^d	1	20.65 ^d	1	9.25 ^c
Imagery-strength (Is)	3	.94	3.33 ^b	1	4.65 ^b	1	5.43 ^b	1	.58
Interactions									
I x Is	3	.98	1.27	1	3.24 ^a	1	.33	1	1.93
Residual	154			156		156		156	

^a p < .10

^b p < .05

^c p < .01

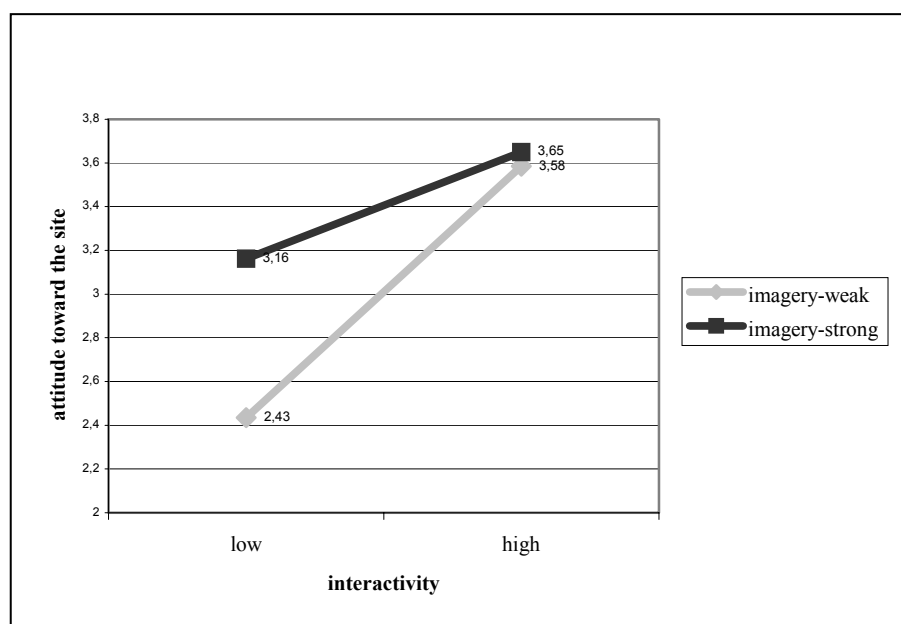
^d p < .001

The ANOVA results regarding effects of imagery-strength on the three dependent variables were less homogenous. Main effect of imagery-strength on A_{site} (M(weak)=3.01, M(strong)=3.41, F[1,156]=4.65, p<.05) and on A_{brand}

($M(\text{weak})=4.05$, $M(\text{strong})=4.47$, $F[1,156]=5.43$, $p<.05$) was significant, but on BI ($M(\text{weak})=2.74$, $M(\text{strong})=2.89$, $F[1,156]=.58$, $p>.10$) was not. Considering that attitude toward the site is pointed out as one of the major indicators of the effectiveness of web advertising (e.g. Pavlou and Stewart 2000), and that effects of imagery-strength on behavioral intentions are expected the least of all advertising response measures, H4b received partial support. Marginally significant interaction effect emerged between interactivity and imagery-strength (see Figure 2) on the dependent variable A_{site} ($F[1,156]=3.24$, $p<.10$), but not on A_{brand} , and BI.

Figure 2

Graph of interaction effects of interactivity on A_{site}



The last hypothesis (H5) proposed that imagery processing will mediate the effects of levels of interactivity and imagery-strength on the vividness of mental imagery and advertising consequences. Following Burns, Biswas and Babin (1993) to test these hypotheses we also adhered to the procedure advocated by Baron and Kenny (1986). We first examined the effects of the imagery processing variable on the vividness of mental imagery, attitude toward the site, attitude toward the brand and behavioral intentions. Therefore we ran four separate multiple regression analyses with imagery processing as the independent variable. The results indicated, that imagery processing explained significant proportions of variance in all four cases (Vividness $R^2=.31$, $F[1.158]=72.21$, $p<.01$; A_{site} $R^2=.39$, $F[1.158]=101.04$, $p<.01$; A_{brand} $R^2=.32$, $F[1.158]=73.73$, $p<.01$; BI $R^2=.35$, $F[1.158]=85.47$, $p<.01$).

Next, a two-way MANCOVA was run with imagery processing as the covariate, interactivity and imagery-strength of the website as independent variables, and vividness of mental imagery, A_{site} , A_{brand} , and BI as dependent variables (see Table 4). The introduction of imagery processing as a covariate retained the significant effect of interactivity on the dependent variables (Wilks-lambda [interactivity]=.86, $F[4,152]=6.44$, $p<.001$), but resulted in an insignificant effect of imagery strength on the dependent variables (Wilks-lambda[imagery strength]=.96, $F[4,152]=1.62$, $p>.10$). The ANCOVA results showed that imagery processing had highly significant effects on vividness of mental imagery ($F[1,155]=60.3$, $p<.001$), A_{site} ($F[1,155]=91.9$, $p<.001$), A_{brand} ($F[1,155]=62.7$, $p<.001$), and BI ($F[1,155]=83.1$, $p<.001$). Thus, H5 was supported in the sense that imagery processing mediated the effects on vividness of mental imagery, attitude toward the site and the brand as well as behavioral intentions.

Table 4

Mediating Effects of Imagery Processing on Vividness of Mental Imagery, A_{site} , A_{brand} , and BI

	MANCOVA			ANCOVA F-Values							
	df	Wilks	F-Values	df	Vivid.	df	A_{site}	df	A_{brand}	df	BI
Main Effects											
Interactivity (I)	4	.86	6.44 ^d								
Imagery-strength (Is)	4	.96	1.62								
Covariate											
Imagery Processing				1	60.3 ^d	1	91.9 ^d	1	62.7 ^d	1	83.1 ^d
Residual	152			155		155		155		155	

^d $p < .001$

5. General Discussion

In this experiment, we manipulated levels of interactivity and imagery-strength of websites. Our interactivity manipulation was based on a multidimensional conceptualization of the construct with range of interaction, speed of interaction and responsiveness as single dimensions. It was expected that higher levels of interactivity and imagery-strength would increase participants' brand cognition, imagery activities, attitudes as well as behavioral intentions.

To summarize our findings we have demonstrated that progressive levels of interactivity and imagery-strength lead to stronger brand cognition, especially to more brand focusing and more positive associations. Likewise, imagery processing grew stronger as levels of interactivity and imagery-strength of websites increased. Moreover, imagery processing operated as a mediator of mental imagery and advertising effects, which was already stated by Burns, Biswas, and Babin (1993) for offline advertisements. The impact of interactivity and imagery-strength on different dimensions of mental imagery (vividness, intensity, complexity and ease of generation) was mainly positive, too. But especially the increase of complexity of mental imagery in the high interactivity condition led to a decline in the ease of mental imagery generation. Finally, in contrast to Coyle and Thorson (2001) we could show that progressive levels of interactivity (as well as progressive levels imagery-strength) had positive effects on attitudes toward the site and the brand, and partially on behavioral intentions. We could also demonstrate that especially regarding A_{site} interactivity and imagery-strength can amplify each other.

Some potential limitations of our experiment exist. We have described that interactivity drives users' attention and we could show that it stimulates cognitive processing. But we have also stated negative effects of interactivity (Ariely 2000) due to an extra effort needed to navigate through a very interactive website. One limitation of our experiment is that our high interactive SOLA website was still not too interactive. Therefore negative effects were avoided but are possible under certain conditions. Advertisers have to consider that increasing the level of interactivity in their websites ad infinitum could reverse its positive effects.

Another potential limitation of our experiment relates to different involvement situations, which we have neither varied nor manipulated, but which might influ-

ence the perception of interactivity (see also Liu and Shrum 2002). When users search for information on a website (and are cognitively high involved), they usually have a clear utilitarian purpose in mind, such as obtaining information on a product they are planning to buy (Hoffman and Novak 1996). With such information needs, the speed of interaction and the responsiveness (message relatedness) of a website become important. Not surprising, Internet search engines are mostly rated on their speed and hit ratio. However, when users browse merely for pleasure or to pass the time (and are emotionally high involved), they tend to seek hedonic benefits and experiential surfing experiences (Hoffman and Novak 1996). In such conditions, the ability to look around and experience the features of a website (and as a result the range of interaction) may be important for them. Therefore marketers have to consider that range of interaction, responsiveness and speed of interaction (and even further dimensions of interactivity) might not be identically important for searchers and browsers on a website.

Future research should also concern users' Internet experience. We expect that not all users will prefer higher levels of interactivity. Because interactivity requires mental resources, we suggest that it can compete with other cognitive tasks, especially when users are unfamiliar with Internet websites. High interactive websites and little surfing experience could negatively amplify each other and lead to less favorable attitudes and behavioral intentions.

In our experiment we could show that progressive levels of interactivity in Internet websites can be, besides imagery-instructions, concrete words or vivid pictures for example, another imagery-eliciting strategy. We think much more fruitful research may be achieved in the area of mental imagery as it is stimulated by different features of Internet advertising. Besides that, future research should also take into account the monitoring and information collection capabilities of Internet websites (Heeter 1989). Instead of measuring behavioral intentions of users, the measurement of surfing duration and site revisits, or even real purchase simulations could produce much more valid and realistic results for consumer and Internet advertising research.

From the perspective of advertisement practice, interactive websites can enhance the goals and effects of integrated marketing communication (Schulz, Tanenbaum, and Lauterborn 1996; Belch and Belch 2000). With a strict allocation of advertising tasks traditional media should be mainly used to create and strengthen brand awareness. Since brand awareness is a necessary requirement for entering

an URL into a web browser and visiting the website of a certain brand. On the other hand, interactive brand communication by raising the level of interactivity on branded websites would lead to more intensive information processing in consumers. While combining interactivity elements on websites with brand information (key-visuals, positioning statements, brand logos, etc.), the brand image building process could be speed up significantly.

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