Websites in brand communication: interactivity and cross-media effects

Voorveld, H.A.M.

Publication date
2010

Chapter 3

Measuring Interactivity of the Websites of Brands[3]

Abstract

This study aims to develop a new coding instrument to examine the interactivity of the websites of global brands. The new instrument contains 47 interactive functions and is directly linked to theory on interactivity. To test the applicability of the instrument, the interactivity of 66 American and 66 Dutch websites was investigated by means of a content analysis. Results showed that the instrument can be used in different contexts. In addition, the content analysis discloses interesting differences between American and Dutch websites, and between the websites of different types of products. Practitioners can use the instrument to assess the interactivity of their own websites.

[3] A version of this chapter is accepted for publication as: Voorveld, H. A. M., Neijens, P. C., & Smit, E. G. (in press). Measuring interactivity of the websites of brands. *Journal of Advertising Research*.

The authors would like to thank Ivana Perkovic and Michel Vlasblom Van Reijmersdal for their assistance.

Introduction

Interactivity is often perceived as the defining difference between traditional and new media (Chung & Zhao, 2004), and as a key element of successful online advertising (Thorbjornson, Supphellen, Nysveen, & Pedersen, 2002). Consequently, interactivity is a central issue in the current advertising literature (e.g., Bezjian-Avery, Calder, & Iacobucci, 1998; McMillan, Hwang, & Lee, 2003; McMillan, Hoy, Kim, & McMahan, 2008; Liu, 2003; Macias, 2003). The websites of brands can provide many interactive features; therefore, several studies have investigated the interactivity of such websites. The first effort to map interactivity of the websites of brands was made more than a decade ago by Ghose and Dou (1998), who listed 23 interactive website functions and content analyzed 101 websites. In later studies, research methods were improved by coding in a more systematic way than was carried out by Ghose and Dou (Cho & Cheon, 2005) and assessing intercoder reliability (Tse & Chan, 2004; Cho & Cheon, 2005). However, while websites have changed substantially, the original list of 23 interactive functions was never renewed or extended (Rappaport, 2007). Another problem with earlier content analyses on interactivity at websites is that interactive functions were never linked to three dimensions of interactivity which were proposed in several reviews of the interactivity concept in the marketing and advertising literature: two-way communication, synchronicity, and active control (Liu & Shrum, 2002; McMillan & Hwang, 2002; Song & Zinkhan, 2008).

Whereas there are already some coding instruments to map interactivity in other fields (e.g., Bucy, 2004; McMillan et al., 2008; Paul, 2001), and some instrument that measure how consumers perceive interactivity (e.g., Liu, 2003; Wu, 2006; McMillan & Hwang, 2002), it is the aim of the present study to fill the gap in the marketing and advertising literature by developing a new coding instrument to investigate the interactivity of the websites of brands. By doing so, the study builds upon the current knowledge and conceptualization of interactivity. Furthermore, to test the applicability of the new coding instrument, a content analysis of the interactivity on the websites of the top global brands will be conducted. This content analysis will show whether coders are able to work with the instrument and whether reliability levels acquired with the instrument are sufficient. In addition, we would like to test the applicability of the instrument to different contexts. Therefore, websites from two countries (the United States and the Netherlands) and several types of products were coded. Application of the instrument by means of a content analysis also provides practical insight into the extent to which brands use different forms of interactivity. The developed instrument will be an invaluable

tool for future research as developing a better understanding of how consumers interact with websites is increasingly important today, and will continue to be so in the future.

In this article, we will first discuss the interactivity construct, and then we will summarize the content analyses on the interactivity of the websites of brands which has been carried out prior to our work. In the methodology section, the new coding instrument is presented. We also describe a test which has been developed among experts in the field of interactivity to validate the instrument. Finally, we present the results of the content analysis which reveal the interactivity of the websites of brands.

Background

Definition and Conceptualization of Interactivity

Although there is a large amount of research on interactivity, there is still no consensus about its definition and dimensions (e.g., Liu & Shrum, 2002, Raney, Arpan, Pashupati, & Brill, 2003; Thorbjornson et al., 2002; McMillan & Hwang, 2002; Song & Zinkhan, 2008). As the aim of this study is not to further discuss the definitions and dimensions of interactivity (for reviews we refer to Hwang & McMillan, 2002; Liu & Shrum, 2002; Johnson, Bruner II ,& Kumar, 2006), we decided to follow one study that had an important impact on the interactivity literature. In the marketing and advertising field, Liu and Shrum (2002) were the first who meaningfully synthesized the literature. Their definition and conceptualization is very concrete and based on an extensive discussion of interactivity in the advertising, marketing, and communication literature.

Following Liu and Shrum (2002, p. 54), in this study we define interactivity as: "The degree to which two or more communicating parties can act on each other, on the communication medium, and on the messages and the degree to which such influences are synchronized". Many scholars recognize the multidimensional nature of the interactivity construct (e.g., Liu & Shrum, 2002; McMillan & Hwang, 2002; Song & Zinkhan, 2008). Liu and Shrum (2002) specify three dimensions. These three dimensions serve as umbrellas for many aspects of interactivity that one finds mentioned by other authors in the literature.

The first dimension is two-way communication. "Two-way communication refers to the ability for reciprocal communication between companies and users, and users and users" (Liu & Shrum, 2002, p. 55). On closer examination, other scholars also describe this dimension, but refer to it using terms such as: communication (Song & Zinkhan, 2008), bi-directional

flow of information (Liu, 2003), and direction of communication (McMillan & Hwang, 2002). Functions that could facilitate two-way communication are, for instance, chat rooms, bulletin boards, e-mail links, online order facilitations, and feedback mechanisms (e.g., McMillan & Hwang, 2002; Liu & Shrum, 2002; Song & Zinkhan, 2008).

The second dimension, synchronicity, refers to "the degree to which users' input into a communication and the response they receive from the communication are simultaneous" or without delay (Liu & Shrum, 2002, p. 55). Other scholars refer to this dimension using terms such as: responsiveness (Song & Zinkhan, 2008), time (McMillan & Hwang, 2002), and speed of response (Johnson et al., 2006). Website functions that could enhance synchronicity are functions that enhance the perception that a website responds immediately, for example an option to choose a type of internet connection, or animations that display the time it takes for the website to load.

The third dimension is active control. "Active control is characterized by voluntary and instrumental action that directly influences the controller's experience" (Liu & Shrum, 2002, p. 54). Other authors also refer to this dimension as: control (Song & Zinkhan, 2008), user control (McMillan & Hwang, 2002), and a user's ability to voluntarily participate in and instrumentally influence a communication (Liu, 2003). Active control is facilitated by the presence of navigational tools, search options, sitemaps, and links (e.g., McMillan & Hwang, 2002; Song & Zinkhan, 2008).

Previous Content Analyses

Five earlier studies investigated the interactivity of the websites of brands. The first three content analyses mainly focused on listing and detecting these functions on websites (Ghose & Dou, 1998; Ha & James, 1998; Tse & Chan, 2004). The fourth and fifth content analysis compared interactivity of websites across cultures (Cho & Cheon, 2005; Okazaki, 2005). These comparisons were driven by the ongoing debate on whether or not to globalise (also called standardise) or localise (also called regional adaptation) international marketing (Okazaki, 2005).

The first content analysis of interactivity on the websites of brands was conducted by Ghose and Dou, back in 1998. They listed 23 interactive website functions and coded 101 websites. Results show that websites with many interactive functions were more likely to be included in the Lycos Top 5% list (a list of high quality websites) than websites with less interactive functions. The second content analysis by Tse and Chan (2004) replicated these findings by using an improved research methodology, for instance, by assessing inter-coder

reliability. Third, Ha and James (1998) also performed a content analysis of interactivity on the websites of brands. Although the interactive functions were not explicitly based on the list made by Ghose and Dou (1998), they largely overlapped. The main conclusion of this content analysis was that websites for products, services, and retail outlets differed in terms of interactivity.

The fourth study, which compared interactivity between countries, was conducted by Okazaki (2005) who content analyzed the presence of some interactive functions on home pages of American and European websites of brands. He found that American brands mainly adopted a localization strategy, so home pages from the U.S. and Europe were somewhat different with regards to their interactivity.

The last study also made a cross-cultural comparison of interactivity. Cho and Cheon (2005) assigned the 23 interactive functions of Ghose and Dou (1998) to three types of interactivity: consumer-marketer interactivity, consumer-message interactivity, and consumer-consumer interactivity. Then they compared interactivity on websites from Western and East Asian countries and found several differences. They showed, for example, that Western websites used forms of consumer-message interactivity and consumer-marketer interactivity, while Eastern websites emphasized consumer-consumer interactivity.

The Present Study

The present study builds on previous research in three ways. First, earlier content analyses of the websites of brands used the list of 23 interactive functions developed by Ghose and Dou in 1998, although they acknowledge that this list has probably become outdated (Cho & Cheon, 2005). Therefore, we develop a new list of interactive functions.

Second, we categorize all interactive functions into the three interactivity dimensions: two-way communication, synchronicity, and active control. By doing so, we state that interactive functions are kinds of manifest variables for the underlying latent interactivity dimensions. We code the manifest content (i.e., interactive website functions) to determine which interactive functions and underlying dimensions are present on the websites of top global brands. In this way, we directly link the interactive website functions included in the instrument to theory on interactivity. Earlier content analyses lacked such a strong theoretical foundation.

Third, we test the applicability of the coding instrument by performing a content analysis on the websites of top global brands. To see whether the instrument is applicable to different contexts, we code websites from two

countries: the Netherlands and the U.S., and we code the websites of several product categories.

Method

Development of the Coding Instrument

The coding instrument has 50 interactive functions (see Table 2). These functions were acquired from earlier content analyses of interactivity on websites (e.g., Ghose & Dou, 1998; Ha & James, 1998; Cho & Cheon, 2005; Dou & Krishnamurthy, 2007). Additional interactive functions were obtained from the literature about interactivity (e.g., Song & Zinkhan, 2008, Johnson et al., 2006; McMillan & Hwang, 2002) and by browsing websites that were not included in the sample.

The 50 interactive functions were categorized into three previously described interactivity dimensions (see Table 2). To validate whether these 50 interactive functions were assigned appropriately to the three dimensions, we conducted an expert test to assess the face validity and content validity of our classification. This expert test is based on the work of Cho and Cheon, (2005) who claimed that: "Because both face and content validity are judgmental, we surveyed experts in the field of interactivity research" (Cho & Cheon, 2005, p. 104). Thirteen experts in the field of interactivity research were recruited by placing a request to participate on a virtual community for marketing academics (ELMAR) and by e-mailing researchers who have published about interactivity. We gave a description of each interactive function and interactivity dimension. To measure face validity, 50 questions were posed. We measured the extent to which an interactive function belonged to the pre-assigned interactivity dimension. The experts were asked to what extent an interactive function represented the pre-assigned dimension of interactivity. The scales ranged from 1 (fails to represent) to 7 (represents well). To assess content validity, one question was posed for each interactivity dimension. We asked whether the representative website functions were thorough enough to measure the interactivity dimension. Thus, in order to make this assessment, the scales ranged from 1 (not at all thorough) to 7 (very thorough). Concerning content validity, the results showed that the means for the three interactivity dimensions were not significantly lower than the scale midpoint. Thus, the content validity of our classification was confirmed.

With regards to face validity, the results showed that only three interactive functions had a mean face validity score significantly lower than the scale midpoint: FAQ's, sweepstakes/ prizes and electronic coupons. These three functions were clearly considered as interactive in the literature (Ghose & Dou,

1998; Ha & James, 1998; Cho & Cheon, 2005; Song & Zinkhan, 2008), but our experts did not agree on the dimension they belonged to. Therefore, we decided to exclude these three interactive functions from further analyses. The final instrument included 47 interactive functions.

Sample

A ranking of the top 100 global brands was used for selecting the websites in our content analysis The list was compiled by BusinessWeek (2007) and includes brands that meet three criteria: (1) The brands derived at least a third of its earnings outside its home country, (2) the brand name is familiar beyond its base of customers and (3) marketing and financial data are publicly available. To make a comparison between countries, only brands that had both an operating American and a Dutch website were selected for this study. Moreover, search engine websites, online auction sites (e.g., Ebay) and websites from brands that only existed on the internet (e.g., Amazon) were removed from the sample. This selection process resulted in 66 websites for each country. Thus, in total 132 websites were coded. Table 1 lists the brands whose websites were analysed in this study. Some examples are: Coca Cola, Siemens, Mercedes-Benz, BMW, McDonalds, and Shell. The brands were categorized into three different product types: non-durable goods, durable goods, and services. The categorization of the brands was based on the work of Okazaki (2005, 2006).

Table 1. *Brands investigated in this study*

Product-type	Brands	Percent
Non-durable goods	Coca Cola, Colgate, Danone, Gilette, Hermès, Johnson & Johnson, Kelloggs, Kleenex, Kodak, Kraft, L'Oréal, Nescafe, Nestle, Nivea, Pepsi, Ralph Lauren, Smirnoff, Wrigley	28%
Durable goods	Apple, Audi, BMW, Canon, Caterpillar, Dell, Duracell, Ford, General Electric, Harley–Davidson, Honda, HP, Hyundai, IBM, Lexus, LG, Mercedes Benz, Microsoft, Motorola, Nintendo, Nissan, Nokia, Panasonic, Philips, Porsche, Samsung, Siemens, Sony, Toyota, Volkswagen, Xerox	47%
Services	Accenture, Allianz, American Express, BP, Cisco, Disney, Hertz, IKEA, ING, JP Morgan, KFC, McDonalds, MTV, Pizza Hut, SAP, Shell, UPS	25%

Procedure

Two bilingual coders, not including one of the authors, were made familiar with the definitions of each interactive function and were trained to

code the websites. They coded whether each of the interactive functions was present (1) or absent (0). Both coders coded all 132 (66 Dutch and 66 American) websites, since to test the degree of consistency among coders, at least two coders must make judgments on the same material (Potter & Levine-Donnerstein, 1999).

One complicating factor for the content analysis of websites is that websites are always changing and being updated. "To avoid this pitfall, the time and date at which web pages are coded must be carefully controlled" (Weare & Lin, 2000, p. 287). Another possibility is to save all websites. However, saving websites has an important disadvantage: some interactive functions become inoperative. Because these interactive functions are very important to our content analysis, we decided to control for possible changes by having the coders code at the same time and on the same day (McMillan, 2000).

The unit of analysis for this study consisted of two parts: (1) the home pages of each website (i.e., the first-level pages) and (2) all the pages hyperlinked from the home page (i.e., the second-level pages) (Cho & Cheon, 2005). Many earlier content-analyses of websites only coded home pages (for an overview see: Weare & Lin, 2000; McMillan, 2000), but focusing solely on home pages does not appropriately represent communication via websites (Weare & Lin, 2000). On the other hand, coding an entire website could be time-consuming as well as confusing (Ha & James, 1998; Okazaki, 2005), because the sizes of websites nowadays are enormous (McMillan, 2000). It is also hard to determine where one website ends and another website begins (Weare & Lin, 2000). Limiting our analysis to the first two levels of the websites improved the accuracy of our analysis, while giving us a more in-depth view than if we had only coded home pages. In addition, recent research suggests that for investigating website interactivity coding two levels is "the best trade-off between finding interactivity and the time it takes to find it" (McMillan et al., 2008, p. 799).

As coders were required to examine a substantial part of the website, the researchers developed clear instructions for them on how to explore the site (Weare & Lin, 2000). The coders coded the website as if they were reading a text. Thus, the coders first coded the home page. Then, on the home page, they clicked on the most upper-left link. After this page was coded, the coders returned to the home page to save them from being lost and taken off the website. Then they worked their way through the home page from left-to-right and top-to-bottom. Because coding many websites on one day is a threat to reliability (Potter & Levine-Donnerstein, 1999), the coders coded a maximum of eight websites a day. Coding took place from April 16 to May 20, 2008.

Results

Intercoder Reliability

Intercoder reliability was calculated using the reliability index suggested by Perreault and Leigh (1989). This index is considered to be superior by many researchers (e.g., Kolbe & Burnett, 1991; Okazaki & Rivas, 2002). The advantage of Perreault and Leigh's index is that it corrects for agreement by chance, because it accounts for differences in reliabilities due to the number of categories (Perreault & Leigh, 1989; Kolbe & Burnett, 1991). The reliability scores ranged from .74 to 1 (see Table 2), with a mean value of .90. We decided not to remove any interactive functions from our analysis for three reasons. First, a large majority of the reliability indexes exceeded the recommended minimum value of .80. Second, the interactive functions that did not exceed the recommended value of .80, only scored slightly below this value, with a minimum of .74. Finally, the mean reliability score of .90 showed us that the instrument as a whole can be used in a reliable way. As the content of websites is in constant flux, it was not possible to resolve disagreements among the coders after the coding period was finished. As a consequence we only used the data on which both coders agreed, which resulted in some missing data (9.87%).

Application of the Instrument

After having developed the coding instrument, we were able to test the applicability of the instrument and explore which interactive functions and underlying dimensions are present on the websites. We first examined the presence of the individual interactive functions. Then we calculated an index score for each interactivity dimension by adding the number of interactive functions used on each website and dividing this number by the total interactive functions within a dimension (* 100) (Cho & Cheon, 2005).

Two-way Communication

The most commonly used interactive function representing the two-way communication dimension was the presence of multiple modes of contact, which was present on 92.3% of the websites (see Table 2). The majority of the websites also included an online job placement (53.3%), in which visitors had the opportunity to search for a job online. On somewhat more than 40% of the websites, there was an option to order products online. On about 15% of the websites, visitors could recommend the website or product to a friend, visitors could type in their feedback, and/or there was an online problem diagnostics function.

Table 2. *Operationalization, reliability, and coding results of interactivity functions*

Dimension	Function			Presence				Presence			
		Ir	*N*	Total	U.S.	NL	X^2	Non-durable	Durable	Service	X^2
Two-way communi-cation	Multiple modes of contact: for example, telephone, e-mail or online form	0.88	117	92.3	95.0	89.5	1.26	81.3	100.0	89.7	10.46**
	Online job placement: online resume submission, personal career goal check etc.#	0.80	107	53.3	65.3	43.1	5.26*	32.3	58.3	67.9	8.39*
	Online order: an option to order products online #	0.84	113	40.7	57.4	25.4	11.95**	26.5	52.8	34.6	6.48**
	The possibility to recommend the website or product to a friend	0.83	112	17.0	23.1	11.7	2.58	26.5	12.0	14.3	3.20
	A feedback form: customers can type their feedback in e-forms #	0.90	120	16.7	24.1	9.7	4.51*	8.1	17.0	26.7	4.12
	Online problem diagnostics: customers report their problem spots and this function helps them to locate the problem exactly #	0.90	120	15.0	15.3	14.8	0.01	5.7	25.9	6.5	9.20**
	Podcasts: a program made available in digital format for automatic download	0.92	122	11.5	21.7	1.6	12.07**	5.6	10.5	20.7	3.72

Table 2 (continued). *Operationalization, reliability, and coding results of interactivity functions*

Dimension	Function	*Ir*	*N*	Presence			X^2	Presence			X^2
				Total	U.S.	NL		Non-durable	Durable	Service	
	Product registration: possibility to register a product online, to obtain updates, information or incentives #	0.95	125	10.4	12.7	8.1	0.72	0.0	23.2	0.0	17.88**
	Blogs: an online personal journal	0.95	125	8.8	12.9	4.8	2.58	8.1	7.1	12.5	0.76
	An online game against a computer #	0.92	122	8.2	8.5	7.9	0.01	15.2	3.4	10.0	4.06
	User groups: online community for users #	0.77	105	7.6	5.9	9.3	0.43	0.0	11.1	12.0	4.35
	Surfer postings: a section where surfers can write stories, opinions or convey messages #	0.93	123	4.9	6.6	3.2	0.74	0.0	8.9	3.3	4.03
	Survey of the company: survey for visitors that solicits their comments on the content and design of the site or the firms offering and service #	0.94	124	3.2	5.1	1.5	1.25	2.8	3.6	3.1	0.05
	An online fan club: a community of people who share a strong interest in the brand or product	0.86	115	2.6	3.6	1.7	0.40	0.0	4.1	3.2	1.40

Table 2 (continued). *Operationalization, reliability, and coding results of interactivity functions*

Dimension	Function	*Ir*	*N*	Presence			X^2	Presence			X^2
				Total	U.S.	NL		Non-durable	Durable	Service	
	Personal choice helper: a function that can make relatively sophisticated recommendations on consumers' choices based on their preferences and decision criteria #	0.80	106	1.9	3.9	0.0	2.20	3.1	2.1	0.0	0.80
	E-cards: the possibility to send electronic cards #	0.98	129	1.6	1.6	1.5	0.00	0.0	0.0	6.1	5.91*
	Product suggestions of other customers	0.99	131	0.0	0.0	0.0	n.a.	0.0	0.0	0.0	n.a.
	An online game against other players	0.98	130	0.0	0.0	0.0	n.a.	0.0	0.0	0.0	n.a.
	Online chatting: chatting with other customers or employees using chatting programs	0.97	128	0.0	0.0	0.0	n.a.	0.0	0.0	0.0	n.a.
	FAQ's: Frequently Asked Questions [a]										
	Sweepstakes/ prizes: events held to attract surfers and to encourage participation by incentives [a]										
	Electronic coupons [a] #										

Table 2 (continued). *Operationalization, reliability, and coding results of interactivity functions*

Dimension	Function	*Ir*	*N*	Presence			X^2	Presence			X^2
				Total	U.S.	NL		Non-durable	Durable	Service	
Synchronicity	Animation that displays the time it takes for the website to load	0.77	105	28.6	38.5	18.9	4.94*	41.2	29.8	8.3	7.50**
	Virtual reality display: a function that permits consumers to virtually "feel or experience" the product #	0.85	114	7.9	8.8	7.0	0.12	2.9	12.8	6.1	2.83
	Live customer service, for example online discussion with a sales representative using instant messaging programs	0.94	125	3.2	5.0	1.5	1.21	2.7	1.8	6.1	1.24
	Skip intro option: an option that allows visitors to skip the introductory page of a website	0.95	125	1.6	3.2	0.0	2.00	3.1	1.7	0.0	1.01
	Speed choice: option to choose a type of internet connection, for example broadband or cable	0.97	128	0.0	0.0	0.0	n.a.	0.0	0.0	0.0	n.a.
	Error message given by the website when there is something wrong with the website	0.91	117	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.

Table 2 (continued). *Operationalization, reliability, and coding results of interactivity functions*

Dimension	Function	*Ir*	*N*	Presence			X^2	Presence			X^2
				Total	U.S.	NL		Non-durable	Durable	Service	
Active control	Internal hyperlinks: links used to navigate within the website	1	132	99.2	98.5	100	1.01	97.3	100.0	100.0	2.59
	Hot links: links used to navigate back to the home page of the website	0.96	126	97.6	98.4	96.8	.38	94.1	100.0	96.9	3.33
	External links: links used to navigate to other websites	0.77	106	92.5	100	84.3	9.33**	91.4	93.0	92.9	.08
	Keyword search: a function that allows visitors to pinpoint particular information #	0.98	129	67.4	78.1	56.9	6.60**	35.1	83.1	75.8	25.17**
	Dealer locator: a function that allows visitors to pinpoint a dealer #	0.83	111	65.8	70.4	61.4	.99	38.2	82.4	69.2	17.82**
	Software downloading: surfers can download software of files from the website, usually for free #	0.74	101	65.3	68.6	62.0	.49	41.4	78.0	68.2	10.97**
	Sitemap: a webpage that displays the structure of a website	0.96	127	63.8	71.4	56.3	3.17	52.8	66.1	71.9	2.93
	Possibility to receive a newsletter	0.86	115	51.3	65.5	38.3	8.45**	38.2	60.0	51.6	3.84

Table 2 (continued). *Operationalization, reliability, and coding results of interactivity functions*

Dimension	Function	*Ir*	*N*	Presence			X^2	Presence			X^2
				Total	U.S.	NL		Non-durable	Durable	Service	
	Dropdown menu's: an interface element which allows visitors to choose a value from a list	0.75	103	45.6	54.7	36.0	3.63	34.4	57.4	37.5	4.92
	Choice of language: an option to choose the language of the website	0.84	113	32.7	43.6	22.4	5.77*	18.2	40.4	35.7	4.67
	Registration requirement to get access to certain parts of the website or certain information	0.75	103	30.1	40.0	20.8	4.53*	17.2	25.5	51.9	8.82**
	Customize product: an option to compose products by yourself	0.89	118	17.8	25.4	10.2	4.69*	8.8	33.3	0.0	17.28**
	Connection with a mobile phone, for example to download games	0.95	125	12.0	17.7	6.3	3.84*	0.0	17.2	16.1	6.92*
	Order status tracking: customers can track the status or whereabouts of their orders online in real time #	0.90	120	9.2	12.1	6.5	1.14	2.8	13.5	9.4	2.92
	Choice to see the text view of the website,	0.84	113	8.8	11.3	6.7	0.76	5.7	4.3	18.8	5.47

Table 2 (continued). *Operationalization, reliability, and coding results of interactivity functions*

Dimension	Function	*Ir*	*N*	Presence			X^2	Presence			X^2
				Total	U.S.	NL		Non-durable	Durable	Service	
	Explicit presence of cookies, for example a button "remember me"	0.88	117	8.5	10.5	6.7	0.56	0.0	7.8	19.4	7.94**
	Personal preference option: possibility to customize information on the website	0.77	105	5.7	8.2	3.6	1.02	0.0	4.8	13.3	5.30
	Possibility to make a wish list, especially in online shops	0.98	130	2.3	4.6	0.0	3.07	0.0	3.3	3.0	1.18
	Choice to see the website with or without flash	0.95	126	2.4	3.3	1.5	0.41	2.9	3.3	0.0	1.02
	Requirement to report your age before entering a website	1	132	0.8	0.0	1.5	1.01	2.7	0.0	0.0	2.59
	Option to change the background colour of the website	0.97	128	0.0	0.0	0.0	n.a.	0.0	0.0	0.0	n.a.
	Possibility to change settings to use the website as your home page	0.98	129	0.0	0.0	0.0	n.a.	0.0	0.0	0.0	n.a.

Note. Presence = percent of the websites that displayed this function; *Ir* = Perreault and Leigh reliability index; *N* = Valid number of observations; n.a. = not available; * = p <.05, ** = p <.01; [a] = removed from the code sheet after the expert test by interactivity experts; # = also present in the coding instrument of Ghose and Dou.

To investigate the underlying interactivity dimensions, we calculated an index score for each interactivity dimension. Table 3 shows that the mean relative index score for the two-way communication dimension was 13.6. This means that only 13.6% of the interactive functions within the two-way communication dimension (= 2.58 functions) were used on the websites of top global brands.

Differences between countries. Table 2 also shows some differences between the Dutch and American websites. From the 19 functions that represented the two-way communication dimension, four functions (21.05%) were significantly more prevalent on websites from the U.S. than on websites from the Netherlands. The functions that were more common on websites from the U.S. were: online job placement, online order, pod casts, and a feedback form.

To see whether the presence of the two-way communication dimension is different in the Netherlands and in the U.S., a t-test was conducted. As shown in Table 3, the mean two-way communication index score for websites from the U.S. (16.27%) was significantly higher than the mean for websites from the Netherlands (10.93%).

Table 3. *Index scores interactivity dimensions for both countries*

Dimension		Total	U.S.	NL	*t*
Two-way communication	Percent	13.60 (9.69)	16.27 (10.68)	10.93 (7.80)	-3.28**
Synchronicity	Percent	6.82 (11.55)	9.09 (13.21)	4.55 (9.15)	-2.30*
Active control	Percent	31.44 (11.62)	35.40 (11.76)	27.48 (10.10)	-4.15**
Total	Percent	20.94 (8.55)	24.11 (8.96)	17.76 (6.84)	-4.58**

Note. Cell values indicate percent of interactive functions present on the websites of top global brands, standard deviations in parentheses. U.S. = United States, NL = the Netherlands. * $p < .05$, ** $p < .001$.

Differences between types of products. For six out of 19 functions (31.58%) significant differences existed between the three product types (these were online job placement, online problem diagnostics, product registration, online order facilitations, multiple modes of contact, and a possibility to send e-cards). Most of these functions were significantly more prevalent on the websites of durables goods and services than on the websites of non-durable goods.

To see whether the presence of the two-way communication dimension is different for the three different types of products, a GLM (General Linear Model) analysis was conducted with the types of product as the independent variables and the index scores for each interactivity dimensions as dependent variables. As shown in Table 4, the mean two-way communication index score for the websites of durable goods (15.37%) was significantly higher than the mean for the websites of non durable goods (10.10%).

Table 4. *Index scores interactivity dimensions for all product types*

Dimension		Non-durables	Durables	Services	*F*
Two-way communication	Percent	10.10[b] (8.54)	15.37[a] (10.10)	14.19[ab] (9.35)	3.65*
Synchronicity	Percent	9.19 (12.11)	7.10 (11.51)	3.64 (10.55)	2.09
Active control	Percent	24.50[b] (10.63)	34.31[a] (10.24)	33.75[a] (12.24)	10.29**
Total	Percent	16.56[b] (7.71)	23.03[a] (8.21)	21.92[a] (8.52)	7.61**

Note. Cell values indicate percent of interactive functions present on the websites of top global brands, standard deviations in parentheses. U.S. = United States, NL = the Netherlands. * $p < .05$, ** $p<.001$.

Synchronicity

Table 2 shows that the most common interactive function which represents the synchronicity dimension of interactivity is an animation that displays the time it takes for the website to load. This was present on 28.6% of the top brands websites. A virtual reality display, a function that permits consumers to virtually "feel or experience" the product, was present on only 7.9% of the websites. A live customer service was present on only 3.2% of the websites. The presence of the other interactive functions that represent the synchronicity dimension can be found in Table 2. Regarding the underlying interactivity dimension, Table 3 shows that the mean relative index score for the synchronicity dimension was 6.82 (= 0.34 functions).

Differences between countries. From the six functions that represented the synchronicity communication dimension, only one function (16.67%) was significantly more common on websites from the U.S. than on websites from the Netherlands: an animation that displays the time it takes for the website to load. The mean synchronicity index score for websites from the U.S. (9.09%) was significantly higher than the mean for Dutch websites (4.55%) (see Table 3).

Differences between types of products. Only one small, but significant difference was found between brands on this dimension. An animation that displays the time it takes for the website to load was more prevalent on the websites of durable and non-durable goods than on the websites of services. Furthermore, there were no significant differences found for the index scores for this dimension (see Table 4).

Active Control

The most commonly interactive functions representing the active control dimension of interactivity were the presence of internal links (99.2%), hotlinks (97.6%) and external links (92.5%) (see Table 2). The majority of the websites also offered a keyword search (67.4%), a dealer locator (65.8%), software downloading (65.3%), a sitemap (63.8%), and the possibility to subscribe to a newsletter (51.3%) (see Table 2). Although they were not present on the majority of websites, other popular functions were: dropdown menu's (45.6%), language choice (32.7%), registration requirement (30.1%), an option to customize products (17.8%), and a possibility for connection with a mobile phone (12.0%). The mean relative index score for the active control dimension was 31.44 (= 6.92 functions).

Differences between countries. Seven out of 22 functions (31.8%) were significantly more common on websites from the U.S. than on websites from the Netherlands. The functions that were more prevalent on websites from the U.S. were: external links, keyword search, a possibility to receive a newsletter, choice of language, registration requirement, connection with a mobile phone, and an option to customize a product. As shown in Table 3, the mean active control index score for websites from the U.S. (35.40%) was significantly higher than the mean for websites from the Netherlands (27.48%).

Differences between types of products. For seven out of 22 functions (31.8%) significant differences existed between the three product types (these were a dealer locator, search option, registration requirement, connection with a mobile phone, software downloading, presence of cookies, and an option to customize product). Five of these functions were significantly more prevalent on the websites of durable goods and services than on the websites of non-durable goods.

To see whether the presence of this dimension is different for the three different types of products, a GLM analysis was conducted. As shown in Table 4, the mean active control index score for the websites of durable goods (34.31%) and services (33.75%) was significantly higher than the mean for the websites of non durable goods (24.5%).

Overall Interactivity

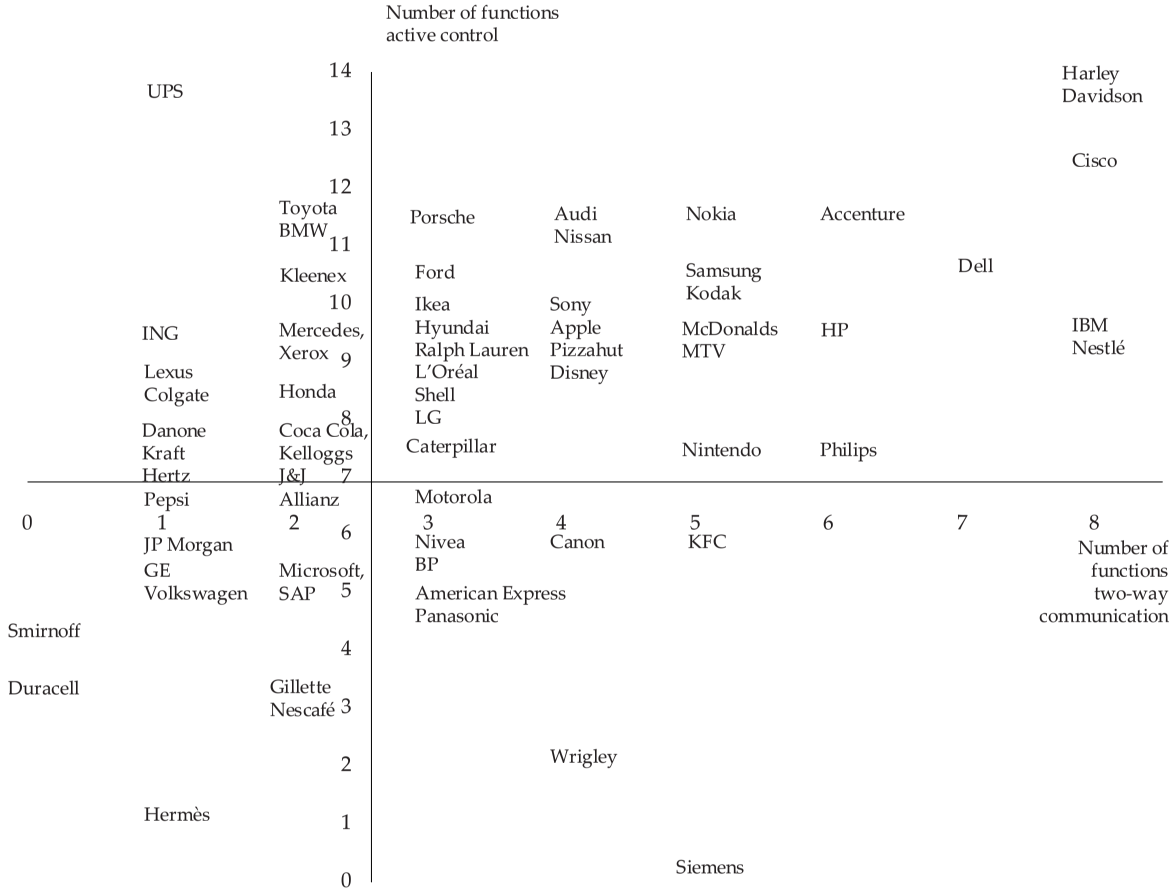
To draw conclusions on the total amount of interactivity on the websites of top global brands, index scores for the total interactivity were calculated by adding the total number of interactive functions used on each website (see Table 3 and 4). These scores show that a mean of 20.94% of the total interactive functions (= 9.84 functions) was used on a website. The mean index score was significantly higher for websites from the United States (24.11%) than from the Netherlands (17.76%). The scores were also significantly higher for the websites of durable goods (23.03%) and services (21.92%) than for the websites of non-durable goods (16.56%).

Figure 1 gives insight into the relative position of the investigated brands on the two most important dimensions of interactivity: two-way communication and active control. For the sake of simplicity and because functions representing the synchronicity dimension were hardly present, we decided to omit this dimension from our graphical presentation. Figure 1 provides additional support for our conclusions regarding the differences between product types. Durable goods, and to a lesser extent, services, are overrepresented in the upper-right quadrant of the figure, while non-durable goods are overrepresented in the bottom-left quadrant of the figure.

Conclusion and Discussion

The main aim of this study was to develop a new instrument to measure interactivity of the websites of top global brands. The study responded to the call for an up-to-date coding instrument to substitute the well-known but outdated coding instrument which was developed by Ghose and Dou (1998). A list of 50 interactive functions was composed from the interactivity literature. By assigning these interactive functions to three interactivity dimensions (i.e., two-way communication, synchronicity and active control), the study builds upon the conceptualization of interactivity in the literature. Moreover, an expert test validated the categorization of the interactive functions to the three dimensions. As a result, the coding instrument is directly linked to the multidimensional nature of the interactivity construct.

Figure 1. *Graphical presentation of the investigated brands*



Another aim of the study was to test the applicability of the instrument by investigating which interactive functions and underlying interactivity dimensions were present on the websites of top global brands. Application of the instrument showed that coders were able to use the instrument without any difficulties, and that reliability levels were considered as good. Furthermore, the coding instrument was applicable to different contexts. The instrument was internationally applicable and was able to differentiate between websites from the U.S. and the Netherlands. The instrument was also applicable to websites from different product categories and it could differentiate between brands.

The results of our content analysis also gave insight into the interactivity of the websites of top global brands. In sum, the results showed that interactive functions representing the active control dimension of interactivity were most prevalent. Common functions within this dimension were the presence of all kind of hyperlinks, search functions, software downloading, sitemaps, and an option to subscribe to a newsletter. Functions representing the two-way communication dimension were somewhat less common. Frequently used functions within the two-way communication dimension were the presence of multiple modes of contact, online job placement, and online shopping facilities. Interactive functions which facilitate synchronicity were relatively scarce. The only function that was present on a fairly large number of websites was an animation that displays the time it takes for the website to load.

Our conclusion regarding the differences between websites from the U.S. and the Netherlands is not univocal. When looking at the individual interactive functions we conclude that websites from the U.S. and the Netherlands are quite similar. Only 12 out of 47 functions were significantly more prevalent on websites from the U.S. than on websites from the Netherlands. In contrast, when investigating the index scores we should conclude that websites from the U.S. are more interactive then their Dutch counterparts. Regarding the differences between types of brands, we can conclude that the websites of durable goods and services are somewhat more interactive than the websites of non-durable goods.

In conclusion, our study has provided an important step towards developing a new coding instrument to measure website interactivity. Tentative conclusions can be drawn concerning the reliability and validity of the instrument. An initial effort was made to assess face and content validity of the instrument by conducting an expert test among the experts in the field of interactivity research. The new instrument showed high levels of inter-coder

reliability. Furthermore, the instrument was applicable to different contexts and was sensitive enough to differentiate between countries and brands.

Limitations and Future Research

Although the study improved our knowledge of interactivity, there are some limitations. The most important limitation was that the coders coded 'only' two website levels (i.e., all home pages and all the pages hyperlinked from the home page). Coding two levels is an improvement on some earlier content analyses that coded only home pages. However, it still gives a snapshot of a website and not a complete picture. To code entire websites, automatic content analysis procedures could offer interesting opportunities. Therefore, future research could map the interactivity of entire websites by using such techniques.

Now that we know which interactive functions are present on the websites of top global brands, future research might also investigate the relationship between objectively assessed interactivity and interactivity perceptions. Although it is suggested that increasing the quantity of interactive functions on a website results in a higher perceived interactivity (Macias, 2003; Sicilia, Ruiz, & Munuera, 2005), there is also some evidence that this may not be the case (McMillan, 2002; Liu & Shrum, 2002; Song & Zinkhan, 2008). Strikingly, there has been little research in examining which interactive functions determine the perceived interactivity of a website. Only when this question is answered, marketers know which interactive functions enhance the perceived interactivity of a website. The coding instrument that was developed in the current study might be valuable for such an effort. Future research could, for example, combine a content analysis of interactive website functions with a survey in which the perceived interactivity of the same websites is measured.

Managerial Implications

The study has some important managerial implications. Practitioners can benefit both from the developed instrument, as well as from the findings of the content analysis. The instrument can be used by practitioners to assess the interactivity of their own websites. Thereby, it shows which forms of interactivity are already used and what theoretical dimensions of interactivity are covered the most. Practitioners can also use the instrument to compare the level of interactivity on their own website with the websites of their competitors. The findings of the content analysis can serve as a benchmark; practitioners can compare the interactivity of their own websites to the websites of the top global brands. Finally, future research that will utilize the developed instrument will

also help practitioners in developing a better understanding on the uses and effects of interactivity.

References

Bezjian-Avery, A., Calder, B., & Iacobucci, D. (1998). New media interactive advertising vs. traditional advertising. *Journal of Advertising Research, 38*(July/August), 23-32.

Bucy, E., P. (2004). Second generation net news: Interactivity and information accessibility in the online environment. *The International Journal on Media Management, 6*(1/2), 102-113.

BusinessWeek. (2007). The 100 top brands. *BusinessWeek,* 59-62.

Cho, C. H., & Cheon, H. J. (2005). Cross-cultural comparisons of interactivity on corporate websites. *Journal of Advertising, 34*(2), 99-115.

Dou, W., & Krishnamurthy, S. (2007). Using brand websites to build brands online: A product versus service brand comparison. *Journal of Advertising Research, 47*(2), 193-206.

Ghose, S., & Dou, W. (1998). Interactive functions and their impacts on the appeal of internet presence sites. *Journal of Advertising Research, 38*(2), 29-44.

Ha, L., & James, E. L. (1998). Interactivity reexamined: A baseline analysis of early business web sites. *Journal of Broadcasting & Electronic Media, 42*(4), 457-474.

Johnson, G. J., Bruner II, G. C., & Kumar, A. (2006). Interactivity and its facets revisted. *Journal of Advertising, 35*(4), 35-52.

Kolbe, R. H., & Burnett, M. S. (1991). Content-analysis research: An examination of applications with directives for improving research reliability and objectivity. *Journal of Consumer Research, 18*(2), 243-250.

Liu, Y. (2003). Developing a scale to measure the interactivity of websites. *Journal of Advertising Research, 43*(2), 207-216.

Liu, Y., & Shrum, L. J. (2002). What is interactivity and is it always such a good thing? Implications of definition, person, and situation for the influence of interactivity on advertising effectiveness. *Journal of Advertising, 31*(4), 53-64.

Macias, W. (2003). A beginning look at the effects of interactivity, product involvement and web experience on comprehension: Brand web sites as interactive advertising. *Journal of Current Issues & Research in Advertising, 25*(2), 31-44.

McMillan, S. J., Hwang, J. S., & Lee, G. (2003). Effects of structural and perceptual factors on attitude toward the website. *Journal of Advertising Research, 43*(4), 400-409.

McMillan, S., J. (2000). The microscope and the moving target: The challenge of applying content analysis to the world wide web. *Journalism & Mass Communication Quarterly, 77*(1), 80-98.

McMillan, S., J. , & Hwang, J. S. (2002). Measures of perceived interactivity: An exploration of the role of direction of communication, user control, and time in shaping perceptions of interactivity. *Journal of Advertising, 31*(3), 29-42.

McMillan, S., J., Hoy, M., G., Kim, J., & McMahan, C. (2008). A multifaceted tool for a complex phenomenon: Coding web-based interactivity as technologies for interaction evolve. *Journal of Computer-Mediated Communication, 13*(4), 794-826.

Okazaki, S. (2005). Searching the web for global brands: How American brands standardise their web sites in Europe. *European Journal of Marketing, 39*(1/2), 87-109.

Okazaki, S. (2006). Exitement or sophistication? A preliminary exploration of online brand personality. *International Marketing Review, 23*(3), 279-303.

Okazaki, S., & Rivas, J. A. (2002). A content analysis of multinationals'web communication strategies: Cross-cultural research framework and pre-testing. *Internet Research Electronic Networking Applications and Policy, 12*(5), 380-390.

Paul, M. J. (2001). Interactive disaster communication on the Internet: A content analysis of sixty-four disaster relief home pages. *Journalism & Mass Communication Quarterly, 78*(4), 739-753.

Perreault Jr., W. D., & Leigh, L. E. (1989). Reliability of nominal data based on qualitative judgments. *Journal of Marketing Research, 26*(May), 135-148.

Potter, W. J., & Levine-Donnerstein, D. (1999). Rethinking validity and reliability in content analysis. *Journal of Aplied Communication Research, 27*(3), 258-284.

Raney, A. A., Arpan, L. M., Pashupati, K., & Brill, D. A. (2003). At the movies, on the Web: An investigation of the effects of entertaining and interactive Web content on site and brand evaluations. *Journal of Interactive Marketing, 17*(4), 38.

Rappaport, S. D. (2007). Lessons from online practice: New advertising models. *Journal of Advertising Research, 47*(2), 135-141.

Sicilia, M., Ruiz, S., & Munuera, J. L. (2005). Effects of interactivity in a website. The moderating effect of need for cognition. *Journal of Advertising, 34*(3), 31-44.

Song, J. H., & Zinkhan, G. M. (2008). Determinants of perceived website interactivity. *Journal of Marketing, 72*(2), 99-113.

Thorbjornsen, H., Supphellen, M., Nysveen, H., & Pedersen, P. E. (2002). Building brand relationships online: A comparison of two interactive applications. *Journal of Interactive Marketing, 16*(3), 17-34.

Tse, A. C. B., & Chan, C. F. (2004). The relationship between interactive functions and website ranking. *Journal of Advertising Research, 44*(4), 369-374.

Weare, C., & Lin, W. Y. (2000). Content analysis of the World Wide Web: Opportunities and challenges. *Social Science Computer Review, 18*(3), 272-292.