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When the World Wide Web first made the Internet popular with the general public in the mid-1990s, 80 percent of Web users spoke English as their primary language. Today, only half of Web users speak English as their primary language, and by 2004 it is estimated that only a third of Web users will claim English as their first tongue. In spite of those statistics, most websites are offered only in English.

In this study, authors Luna, Peracchio, and de Juan examine how attitudes toward websites vary depending on whether websites are offered in the users' first language or second language. In studies with Spanish-English bilingual speakers (two conducted in Spain, one in the U.S.) they investigate how site design and language interact, examining two features of site design—graphic and cultural congruity—to see how they mediate the effect of language on users' attitudes toward the website and the products offered on the website.

Results show that high graphic congruity and high cultural congruity enhance site and product evaluations of second-language websites relative to first-language websites. Perhaps because second-language ads are intrinsically more effortful to process than first-language ads, high-congruity websites provide bilinguals with the necessary tools for successful processing, resulting in enhanced evaluations.

The results have implications for the study of cross-cultural consumer behavior, for the study of the effect of language on information processing, and for practitioners interested in designing sites appealing to the growing proportion of Web users whose first language is not English.

Specifically, the results suggest that if the site includes relevant graphics that support the content, or includes content that is consistent with consumers' cultures, e-marketers may not need to translate their sites into the local languages. However, it should be noted that this conclusion is supported when attitudinal responses are the focus of the e-marketers' actions; the results may not apply to other types of consumer responses, such as purchase or comprehension.

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Introduction

The Internet has become a medium used by consumers worldwide to make purchases and to search for information. One of the characteristics of the Internet that make it a unique medium is its global reach. Individuals all over the world can access websites regardless of where the sites are hosted. Despite the international reach of the Internet, the majority of websites are offered only in English (Fox 2000). While this may have been appropriate in 1996 when 80 percent of Web consumers' first language was English, only half of current Web consumers speak English as their first language. By 2004, less than one-third of Web consumers worldwide will speak English as their first language (Crockett 2000).

Although U.S. marketers have rushed to build websites to attract and retain prospective local and international customers, little attention has been devoted to considering the impact of the fact that the websites are in the consumers' second language, i.e., English. Research on how consumers, particularly bilingual consumers, react to second-language marketing messages and websites is still in its infancy. Little is known about whether current psycholinguistics and persuasion models are applicable to second-language processing of Web-based messages (Luna and Peracchio 2001b). Even less is known about the factors that influence bilingual consumers' attitudes toward those second-language websites and the products they feature.

In this paper, we investigate how bilingual consumers process first- and second-language information presented on websites. In particular, we assess the impact of first- and second-language website processing on persuasion. We examine how language interacts with several other site design factors to determine international and U.S.-based bilingual website visitors' attitudes toward a website and the products it offers. We examine site design to analyze the effect of a website's congruity on persuasion. We conceptualize congruity in two ways: (1) the congruity between a site's graphics and its text, and (2) the congruity of the website's content with the visitor's culture.

Our first two studies examine graphic congruity as a moderator of language effects on the persuasion of bilingual visitors. The third study explores whether cultural congruity also moderates the influence of language on attitudinal measures. We focus on the impact first-language website processing has on persuasion, as compared with second-language website processing. We theorize that both graphic and cultural congruity will moderate the effect of language on Web-based persuasion. In a practical sense, we address the following question: Can we build websites that are persuasive even in our bilingual visitors' second, or weaker, language? Because language is central in our inquiry, we begin by describing some aspects of bilingual language processing.

Second-Language Processing and Persuasion

The demographics of international Web users reveal that they tend to be highly educated, innovators, and of medium to high social standing and income. Thus, a large number of consumers targeted through the Web at the international level have a working knowledge of English (Fox 2000; Ryan 1999). However, most of them are more fluent in their native language, so navigating through English-language sites is likely to be somewhat challenging. In other words, second-language sites require increased processing effort relative to first-language sites. In addition to language, other factors may affect the effort involved in website processing. For instance, site design factors, such as the congruity of site graphics with text, may influence the amount of effort required to process a website. Based on previous research, it would seem that if language and other site design factors affect how difficult it is to process a website, they may also affect persuasion (Peracchio and Meyers-Levy 1997).

The Revised Hierarchical Model (RHM)

To understand the circumstances in which second-language processing on the Web might influence persuasion, it is useful to examine psycholinguistics models that describe how individuals process and store language. A recent and widely accepted model of bilingual concept representation is the Revised Hierarchical Model, or RHM (Dufour and Kroll 1995; Kroll and de Groot 1997). This model builds on previous findings (Durgunoglu and Roediger 1987; Snodgrass 1984) suggesting that there exist two levels of representation in the bilingual individual's mind: the lexical (word) level and the conceptual (meaning) level. At the lexical level, each language is presumed to be stored separately. However, at the conceptual level, there is a unitary system in which words in each language access a common semantic representation or meaning. Thus, according to Dufour and Kroll (1995), bilingual individuals possess a "hierarchical arrangement of words and concepts, with a separation at the lexical level but with connections to a semantic system that is shared across languages" (p. 166).

The connections between words in different languages made at the lexical level are referred to as word associations or *lexical links*, while the connections in memory between lexical representations in either language and the meanings they represent are referred to as *conceptual links*. The RHM specifies stronger conceptual links between the lexical representations in an individual's first language (L1) and their corresponding semantic representations in memory (concepts) than between second-language (L2) lexical representations and their corresponding concepts. Conceptual links to the individual's L2 are weaker than L1 links because it is only after individuals have achieved a high level of proficiency in their L2 that they no longer have to rely on their L1 to gain access to meaning. Thus, the strength of conceptual links are a function of the L2 proficiency of the individual in question. How-

ever, even after the individual has become fluent in both languages, there is a residual asymmetry in conceptual links (Dufour and Kroll 1995; Kroll and de Groot 1997). Because of this asymmetry, the RHM would suggest that processing an L2 message at the semantic level is more cognitively effortful and less likely to succeed than processing an L1 message.

Empirical testing of the RHM supports the proposition that semantic processing of L2 stimuli is likely to be more difficult than the processing of equivalent L1 stimuli. This effect has been explained by suggesting that L1 stimuli have more direct access to concepts than L2 stimuli due to the asymmetry in the strength of L1 and L2 conceptual links. At the same time, research in psycholinguistics testing the RHM has found that accessing the concepts of an L2 lexical stimulus (such as a written word) may be facilitated by manipulating other elements of the stimulus, such as whether it is accompanied by a congruent picture.

The Importance of Pictorial Cues

La Heij, Hooglander, Kerling, and Van Der Velden (1996) found that the presentation of related pictures facilitated the translation of written stimuli from L2 to L1, in that there were shorter latencies or time delays in word translation. Unrelated pictures, by contrast, generated higher latencies. Thus, pictures seem to aid or hamper language processing, depending on their level of relatedness to the textual stimulus. The findings of La Heij et al. imply that pictures may moderate the language effects predicted by the RHM. That is, the weaker L2 conceptual links may be strengthened by a pictorial cue, which facilitates activation of the concept represented by the L2 word.

Confirming this reasoning, Luna and Peracchio (2001b) showed that pictures that are congruent with (related to) the copy of an L2 ad enhanced recall by bilingual consumers. Hence, an L2 ad could be as memorable as an L1 ad if nonverbal cues were provided to facilitate message processing. Second-language ads seem to benefit from high levels of picture-copy congruity, resulting in increased product evaluations. By contrast, first-language ads exhibited a trend toward lower product evaluations as picture-copy congruity increased. These preliminary attitudinal findings would seem to suggest that language does have an impact on persuasion for bilingual consumers.

In this paper, we extend the domain of the RHM to the persuasive impact of international websites. Our extension of this model builds on the initial findings of Luna and Peracchio (2001b) in predicting that L1 sites will generally be more easily processed than L2 sites. This processing asymmetry may, however, be moderated by the presence or absence of congruent pictures or graphics. Our first two studies examine the effect of this graphic congruity on evaluative responses. Study 3 introduces cultural congruity as another potential moderator of language effects on site effectiveness. In this research, we build upon the recall findings of previous research and extend them to evaluative responses, an important gauge of website effectiveness. We theorize that language and congruity impact site visitors' attitudes, as revealed in product evaluations and attitude toward the website.

Resource-Matching and Attitudes toward Ads, Websites, and Products

The construct of attitude toward the ad (A_{ad}) has been extensively studied in the marketing literature. MacKenzie and Lutz (1989) define it as “a predisposition to respond in a favorable or unfavorable manner to a particular advertising stimulus during a particular exposure occasion” (p. 49). A_{ad} has been found to mediate the influence of advertising and brand attitudes, or A_b (Homer 1990; MacKenzie, Lutz, and Belch 1986). Mitchell (1986) offers evidence that A_{ad} and A_b are indeed separate constructs and examines the process through which verbal and visual components of ads affect both attitudinal constructs. That study found that both picture and copy manipulations could affect A_{ad} .

In an interactive medium like the Web, a similar construct to attitude toward the ad, A_{site} , should be expected to have an important effect (Chen and Wells 1999). In order to have a “sticky” site, one that retains visitors for longer duration and motivates them to return, visitors must have a positive attitude toward the site. Popular, consumer-oriented e-commerce sites frequently belong to cybermediaries, or e-tailers. These Internet marketers normally carry different brands, so our operationalization of A_b is denominated $A_{products}$, or consumers’ general evaluation of all the products available at a particular website. In this paper we focus on the effect of the language and site design factors (for the purposes of this paper, congruity) on subjects’ attitude toward the site (A_{site}) and toward the products offered on the site ($A_{products}$).

The extant literature would seem to indicate that website design elements should affect both A_{site} and $A_{products}$. Resource-matching views of ad processing (Peracchio and Meyers-Levy 1997) suggest that there is an optimal level of processing midway between too much processing and too little. If there is an overabundant opportunity for processing, as when resources far exceed the task requirements, consumers tend to generate counterarguments or a high number of negative thoughts about the ad. When the resources available are not sufficient to process a message adequately, attitudes also suffer. Therefore, if L1 sites, which are more likely to be processed successfully than L2 sites, are accompanied by high-congruity graphics, the result may be overabundant processing opportunities and consequent diminished attitudes. On the other hand, L2 sites are not as likely to be processed semantically. Therefore, high-congruity graphics may assist bilinguals in processing L2 sites without engaging in too much processing. This theorizing would seem to apply to both A_{site} and $A_{products}$. As a result, we expect that high-congruity L2 sites will result in higher scores for A_{site} and $A_{products}$ than high-congruity L1 sites.

In sites containing low-congruity graphics, pictures may not facilitate semantic processing, and therefore will not increase the opportunities for extensive processing in general. While visitors to low-congruity L1 sites may still engage in semantic processing of the site content because of the relative easiness of processing L1 stimuli, visitors to low-congruity L2 sites will not be provided enough opportunity for processing, since neither the language nor the pictures facilitate processing. Therefore, we expect that low-congruity L1 sites will result in higher scores for A_{site} and $A_{products}$ than low-congruity L2 sites.

In summary, language effects on attitude toward the site may be moderated by the level of congruity between the graphics and the verbal content of the website. Attitudes toward the products (A_{products}) featured in the site should follow a pattern similar to A_{site} . We now describe Study 1, which was designed to test our theorizing. Study 2 was conducted to replicate the findings of Study 1 in a different country and thus lend validity to our theorizing and extend our results across cultures.

Study 1

Method

We designed a 2 x 2 (L1 and L2; low and high graphic congruity) between-subjects experiment. Thus, four versions of the same website were prepared, in which the content of the text was identical, but the language and graphics were varied. The study was conducted in Spain, and the websites were presented in either English or Spanish. Subjects whose primary language was Spanish were considered to be in an L1 condition when the ad was presented in Spanish; otherwise, they were in the L2 condition.

The website of a fictitious camera retailer was created for this experiment. It was modeled on typical camera retailing sites. The site consisted of 61 pages, with a total of 50 pictures or graphics. The site included a home page and the following sections: What do you need? (an interactive quiz directing visitors to the cameras they might be most interested in); New Products (a total of 12 cameras in 4 categories: manual, automatic, compact, and digital); Used Products (a long list of a variety of used cameras and photographic equipment); About Us (pages describing the company and its management, personnel, and history); Testimonials (pages containing comments from fictitious past customers); Photo Contest (a page encouraging visitors to enter their pictures in a contest); Contact Us and Order pages; and an internal search facility.

Subjects. A total of 74 fluent Spanish-English bilinguals in Spain participated in the research. They were all students at a large public university; 66.7 percent were males, and the mean age was 22.61. All of them had used the Web before, and 89.3 percent of them used it at least an hour per month. The demographics of this sample fit the general characteristics of Web users in Spain, who tend to be young and educated (Asociación de Usuarios de Internet 2001). Language proficiency was measured by a self-administered questionnaire that included 12 items that asked subjects to rate their proficiency from 1 to 5 (higher scores meant higher proficiency) in Spanish and English in particular situations (such as understanding newspaper headlines) or in general (for example, general reading proficiency). The 12 items were adapted from previous studies (Clark 1981; Liu, Bates, and Li 1992; MacIntyre, Noels, and Clément 1997). Subjects' average L1 rating on the 5-point scale was 4.80 and their average L2 rating was 4.20. All subjects were relatively proficient in both languages, all scoring 2.50 or higher in both L1 and L2. Subjects were more proficient in their first language than in their second language, as shown by a paired *t*-test ($t(73) = 28.31, p < .001$).

Procedure. The experiment took place in a computer room equipped with PCs networked together and with an Ethernet connection to a main server. Participants were asked to sit at their computers individually and key into their Web browser the Internet address at which they filled out the language proficiency questionnaire

in the language of their choice (English or Spanish). Once participants completed the questionnaire, they were directed automatically to the home page of the version of the experimental website to which they were assigned, and they began browsing the site. Subjects were assigned to one of the four websites randomly. After they were finished browsing, subjects were instructed to click on and fill out a second questionnaire in the language of their choice. After completing this questionnaire, participants were debriefed, handed a nominal payment, and dismissed.

Measures. Participants completed two questionnaires in this experiment. The first questionnaire was administered prior to exposure to the experimental website and contained items regarding their language use and other demographic measures. The final questionnaire included the dependent measures. These consisted of five 7-point scales to measure attitude toward the site (the site was boring/exciting, not interesting/interesting, not appealing/appealing, mediocre/exceptional, not fun/fun) and five 7-point scales to measure product evaluations (the products were boring/exciting, not worthwhile/worthwhile, not appealing/appealing, overall inferior/superior, common/unique). Higher scores represented higher evaluations. Additionally, a thoughts protocol was also collected. At the end of the second questionnaire, participants were asked to type all thoughts that occurred to them.

Pretests. The website graphics underwent two pretests. The participants in both pretests were drawn from the same population utilized in the main study (bilingual students at the same university). First, 204 pictures or other graphics judged to be consistent or inconsistent with the site content were preselected. Then, each graphic was rated by 20 bilingual individuals according to its attractiveness. Mean attractiveness ratings for each graphic were recorded. In the process of creating the low- and high-graphic-congruity versions of the experimental website, only graphics with similar attractiveness ratings were assigned to matching pages. For example, if a graphic with a high attractiveness rating was assigned to the Nikon FM2N page in the high-graphic-congruity site, a graphic with a similar high rating was assigned to the matching page in the low-graphic-congruity site. As a result of this procedure, low- and high-congruity-graphic sites did not differ in their attractiveness ($F < 1$).

The second pretest verified that the graphics in the high-congruity condition were indeed expressing the same meaning as the page content in which they were embedded, and that graphics in the low-congruity condition were expressing a different meaning from the page content. We selected two preliminary sets of pictures, one congruent and the other incongruent, to accompany each graphic page. Then, 20 bilingual subjects rated from 1 to 7 the degree to which the graphics were consistent with the content of each of the pages. Higher scores indicated higher graphic congruity. Each subject was presented with both sets of pictures and asked how consistent they were with their corresponding text. To ensure that subjects understood the text fully, the pretests were done only with the Spanish version of the text. Because the pictures were chosen to be culturally neutral (i.e., not specific to either the Spanish or U.S. culture), congruity ratings should not differ in Spanish versus English. This procedure was performed iteratively until all the graphic-inclusive pages had a high- and a low-congruity graphic. For example, if

what was supposed to be a high-congruity graphic did not score high on the congruity pretest, we substituted another graphic and ran the pretest for that graphic with another set of subjects. After several iterations, the sites corresponding to the two congruity conditions were designed to be significantly different in graphic congruity (\bar{X} for low congruity = 1.62, \bar{X} for high congruity = 4.71; $F = 191.15$, $p < .001$). The appendix includes an example of the pages in the final experimental website.

Manipulation Check. The Revised Hierarchical Model suggests that L2 text may be more effortful to process at the conceptual level than L1 text. We included a test of this prediction by presenting subjects with two 7-point scales (the site was easy/difficult to understand and simple/complicated) after they visited the website. Higher scores on these scales indicated greater effort. Scores for the two scales were averaged, as they were highly correlated ($r = .89$). An analysis of the effort scores suggests that L2 sites were more effortful to process than L1 sites ($\bar{X} = 2.35$ versus $\bar{X} = 1.65$; $F = 4.99$, $p < .05$). No other effects were significant ($F_s < 1$). Hence, it would seem that, as predicted by the RHM, L2 sites were more demanding to process than L1 sites.

Results

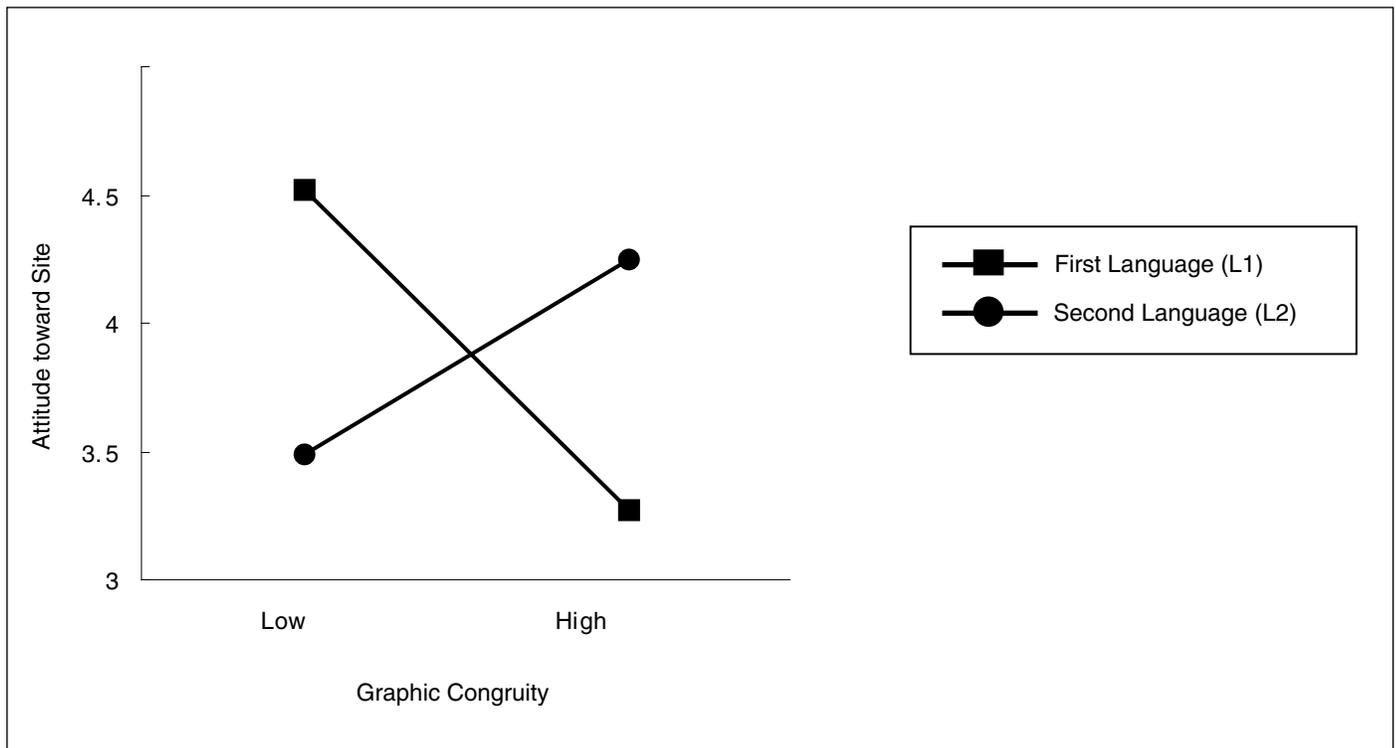
The results were analyzed as a 2 x 2 (L1 and L2; low and high graphic congruity) between-subjects factorial design. Degrees of freedom are 1 and 73 for all analyses unless otherwise noted. Table 1 includes the means and standard deviations for the measures reported below.

Table 1. Studies 1 and 2: Means for All Measures*

	Study 1				Study 2			
	Low graphic congruity		High graphic congruity		Low graphic congruity		High graphic congruity	
	L1	L2	L1	L2	L1	L2	L1	L2
A _{site}	4.52 (1.03)	3.49 (1.51)	3.27 (1.19)	4.25 (1.06)	5.80 (1.02)	4.10 (1.60)	3.97 (1.64)	5.08 (1.15)
A _{products}	5.32 (.82)	5.12 (.87)	4.54 (.86)	5.13 (.67)	5.27 (1.14)	5.28 (1.24)	4.71 (1.19)	5.71 (.81)
Total thoughts	2.74 (1.45)	1.40 (.88)	2.29 (2.20)	2.24 (1.72)	2.29 (2.23)	.93 (1.21)	1.47 (1.30)	2.00 (1.73)
Positive minus negative thoughts	.79 (2.32)	-.25 (.85)	-.88 (2.06)	-.47 (1.74)	2.07 (2.34)	-.29 (1.38)	.47 (1.13)	1.15 (2.08)
Seconds per page	—	—	—	—	32.40 (12.69)	32.88 (14.27)	33.05 (7.71)	42.90 (17.76)

*Standard deviations are in parentheses

Figure 1. Study 1: Two-Way Interaction on Attitude toward the Site



The moderating effect of language and graphic congruity on attitude toward the site follows the anticipated pattern. The results reveal a significant two-way interaction between language and graphic congruity on A_{site} ($F = 12.25, p < .001$). Figure 1 presents these results. A closer inspection of the interaction reveals that, as predicted, in the high-congruity condition the L2 site results in more positive attitudes than the L1 site ($\bar{X} = 4.25$ versus $\bar{X} = 3.27$; $F = 5.38, p < .05$). In the low-graphic-congruity condition the reverse effect is found, as predicted: The L1 site results in more positive attitudes than the L2 site ($\bar{X} = 4.52$ versus $\bar{X} = 3.49$; $F = 7.02, p < .01$).

Attitudes toward the products featured in the site (A_{products}) were also examined. Analysis of this measure showed a significant two-way interaction between language and graphic congruity ($F = 4.26, p < .05$). The results of this measure support our expectations, suggesting the superiority of L2 over L1 under conditions of high graphic congruity ($\bar{X} = 5.13$ versus $\bar{X} = 4.54$; $F = 4.46, p < .05$). However, in the low-graphic-congruity condition there was no significant difference between L1 and L2 ($F < 1$). A possible reason for this measure's failure to support our expectations could lie in the nature of the products and brands offered on the website. All products on the site were actual products representing real brands. In the more effortful and demanding low-congruity condition, subjects in both language

conditions may have relied on their general positive attitudes toward these products rather than processing the site's product information in a detailed manner.

The total number of thoughts produced by subjects is often considered a measure of the amount of processing subjects dedicate to a specific stimulus (in this case, our websites). For total thoughts, there was a marginally significant two-way interaction between language and graphic congruity ($F = 2.89, p < .10$). In the high-graphic-congruity condition, there was no difference in the number of thoughts for the L1 and L2 sites ($F < 1$). In the low-graphic-congruity condition, L1 sites resulted in more thoughts than L2 sites ($\bar{X} = 2.74$ versus $\bar{X} = 1.40; F = 6.79, p < .01$).

An analysis of the valence of subjects' thoughts also provides insight into subjects' processing. It followed a similar pattern to the attitude measures. To examine the valence of subjects' thoughts, we subtracted the number of negative thoughts from the number of positive thoughts generated by subjects. The resulting measure, positive minus negative thoughts, was submitted to an analysis of covariance with two factors, language and congruity, and one covariate, the total number of subjects' thoughts (Aaker and Sengupta 2000). This measure of the valence of thoughts revealed a significant two-way interaction between language and graphic congruity ($F = 4.61, p < .05$). In the high-graphic-congruity condition, there was no difference in the valence of thoughts between the L1 and L2 sites ($F < 1$). In the low-graphic-congruity conditions, the L1 site produced more net positive responses than the L2 site ($\bar{X} = .79$ versus $\bar{X} = -.25; F = 5.75, p < .01$). The impact of the valence of thoughts on both A_{site} and A_{products} was assessed by performing a linear regression of the attitudinal variables on the valence of thoughts. We found that the valence of thoughts was a significant predictor of both A_{site} ($t(73) = 3.55, p < .001$) and A_{products} ($t(73) = 3.21, p < .01$).

To examine whether the difference in subjects' L2 proficiency had an impact on our results, we performed another analysis in which we added to our design a third variable: whether subjects reported a large or a small difference between L1 and L2 proficiency. This analysis yielded nonsignificant main effects of this proficiency variable on both A_{site} and A_{products} ($F_s < 1$) and nonsignificant three-way interactions ($A_{\text{site}}: F = 1.74, p > .20; A_{\text{products}}: F < 1$). Therefore, in our sample of relatively proficient bilinguals, proficiency differences between subjects did not affect their responses to our stimuli.

Discussion

Overall, in this empirical study we explore the interaction between two site design elements in affecting the effectiveness of cross-cultural websites targeting bilingual consumers. The results suggest that the level of graphic congruity can moderate how language affects attitudes toward cross-cultural websites. Thus, our findings are consistent with previous research on advertising recall (Luna and Peracchio 2001b). Countering marketers' intuitions, first-language sites are not always more persuasive than second-language sites, particularly when the sites' graphics support their verbal content. Indeed, in such high-congruity conditions, second-language sites may be even more persuasive than sites in the visitors' local language. For low-congruity sites, however, we find mixed results. Attitude toward the site confirmed

our expectations that L1 sites would be more persuasive than L2 sites under low-congruity conditions, but attitude toward the products featured in the site did not support our predictions. To further examine the impact of language and graphic congruity on attitudes and also to validate our results cross-culturally, we replicated our study in a different country. Study 2 also examines an additional dependent variable, the time that subjects devoted to processing each Web page.

Study 2

Method

The procedure and measures employed in Study 2 were identical to those used in Study 1, except that it took place in southern California. The participants were 55 Spanish-English bilinguals. They were all students at a large community college; 48.2 percent were males, and the mean age was 21.61. All of them had used the Web before, and 89.2 percent of them used it at least one hour per month. Language proficiency was measured using the same scale as in Study 1. For those subjects whose first language was Spanish ($n = 32$), their L1 average rating on the 5-point language scale was 4.77 and their L2 average rating was 4.30. For subjects whose first language was English, their L1 average rating was 4.62, and their L2 average rating was 3.76. All subjects scored 2.50 or higher in both L1 and L2 on the 5-point language scale. They were all more proficient in their first language than in their second language, as shown by a paired t -test ($t(54) = 5.49, p < .001$).

An additional measure was collected in this study: the time, in seconds, that subjects spent on each individual page in the site. This measure was included to provide further insight into the process underlying subjects' attitudinal scores. We expected that subjects in the more effortful L2 condition would spend more time trying to decode the information on each page of high-congruity sites, in which the graphics act as an aid to processing. In the L2, low-graphic-congruity condition, we expected subjects not to stay at any given page as long, because site processing required too much effort. Subjects in the L1 conditions were expected to process the pages equally well at both the high- and low-congruity sites. This reasoning is consistent with the finding of Study 1 and with Luna and Peracchio (2001b).

As in Study 1, a manipulation check was performed to determine whether the L2 sites generally required more effort to process than the L1 sites. The results from the same two 7-point scales (the site was simple/complicated, easy/difficult to understand) were averaged. The results indicate that there was a main effect of language ($F = 5.58, p < .05$), suggesting that L2 sites were more effortful to process ($\bar{X} = 2.27$) than L1 sites ($\bar{X} = 1.43$). No other effects were significant ($F_s < 1$). In addition, in this study the total time spent visiting the whole website was assessed. The results of this measure echo the findings of the effort measures. Subjects assigned to L2 sites spent more time visiting the site than subjects assigned to the L1 sites (1,582 seconds versus 1,236 seconds; $F = 5.98, p < .05$).

Results

The results of Study 2 replicate and validate those of Study 1. The results were analyzed as a 2 x 2 (L1 and L2; low and high graphic congruity) between-subjects factorial design. Degrees of freedom are 1 and 54 for all analyses unless otherwise noted. Table 1 includes the means and standard deviations for all measures.

A two-way ANOVA was performed with A_{site} as the dependent variable and language and graphic congruity as the independent factors. The results reveal a significant

two-way interaction ($F(3,51) = 14.08, p < .001$), confirming the relationship between language and graphic congruity on A_{site} . A closer inspection of the interaction reveals that in the high-congruity condition the L2 site results in more positive attitudes than the L1 site ($\bar{X} = 5.08$ versus $\bar{X} = 3.97; F(3,51) = 4.43, p < .05$). However, in the low-congruity condition the reverse effect is found: The L1 site results in more positive attitudes than the L2 site ($\bar{X} = 5.80$ versus $\bar{X} = 4.10; F(3,51) = 10.19, p < .01$).

The two-way interaction between language and graphic congruity on A_{products} was marginally significant ($F = 2.72, p < .10$). As in Study 1, we find support for our expectations when we analyze A_{products} in the high-congruity condition, as L2 attitudes are more positive than L1 attitudes ($\bar{X} = 5.71$ versus $\bar{X} = 4.71; F(3,51) = 5.70, p < .05$). However, also as in Study 1, in the low-congruity condition there is no difference between the L1 and L2 conditions for A_{products} ($F < 1$).

The thoughts measures also provide results similar to those generated by Study 1. Total thoughts and the number of positive thoughts minus the number of negative thoughts both displayed significant interactions between language and congruity (total thoughts: $F = 4.52, p < .05$; valence of thoughts: $F = 5.11, p < .05$). In the high-congruity condition, there were no differences between the L1 and L2 sites for these measures (F 's < 1). In the low-congruity condition, the L1 site resulted in more total thoughts listed ($F = 4.67, p < .05$) and more net positive thoughts ($F = 6.88, p < .01$) than the L2 site. As in Study 1, we also regressed the two attitudinal variables, A_{site} and A_{products} , on the valence of thoughts. The findings suggest that the valence of thoughts is a significant predictor of both site and product evaluations ($A_{\text{site}}: t(54) = 5.15, p < .001; A_{\text{products}}: t(54) = 4.47, p < .001$).

In Study 2 we also collected a measure of the time (in seconds) each subject spent on each page of the site. The time-per-page results shows that in the high-congruity condition, L2 individuals spent more time in each page than L1 individuals ($\bar{X} = 42.90$ versus $\bar{X} = 33.05; F(1,47) = 4.16, p < .05$). There was no significant difference between L1 and L2 in the low-congruity condition ($F < 1$). This finding suggests that L2 sites can lead visitors to linger on specific pages for a longer period of time while they process the content but only if they have facilitatory cues available, such as graphics that support the verbal content of the page.

Discussion

Study 2 provides cross-cultural validation for the results of Study 1. We find the same pattern of results in both studies, which indicates that our findings are robust across the two cultures we have examined. Our results suggest that language effects on persuasion are moderated by the congruity between the text of an international website and its graphics. Hence, when websites are constructed such that the site graphics are related to or consistent with its text, second-language sites can be as effective as first-language sites or even offer superior results—as in our studies. However, if a site includes a high proportion of unrelated graphics, or graphics that do not communicate the same message as the site's text, then sites in the bilingual consumers' first language may generate a more positive attitude toward the site. Regarding product attitudes, our research does not show support for the superiority of L1 in low-congruity sites.

Study 3

In a third study we examine the potential interaction between language and a second category of congruity: cultural congruity. We define cultural congruity as the agreement between the cultural elements (values, heroes, rituals, and symbols) evident on a site and the cultural elements important to the site's visitors (Luna and Gupta 2001). We investigate the effect of cultural congruity on site and product evaluations.

In Study 3, we also add a third level of congruity—moderate—to our earlier two levels (low and high). High cultural congruity is the state in which cultural elements revealed through both the site's text and its graphics are congruent with visitors' culture; moderate cultural congruity is the state in which either the text or the graphics are culturally congruent with the visitors' culture; low cultural congruity is the state in which neither the text nor the graphics are congruent with the visitors' culture.

Consistent with studies 1 and 2, we expect that in the high-congruity condition there will be a superiority of L2 over L1 because congruity facilitates processing of the site's content. In the case of cultural congruity, a congruent site may increase the ability of individuals to engage in relational processing by providing a familiar context consistent with their prior experiences. In such a context, message encoding would seem to be less effortful. Processing of these sites in L1 may therefore become too unchallenging, resulting in a decrease in attitudes, while processing in L2 may be enhanced to an optimal point because of the familiarity of the culturally congruent content. Therefore, Study 3 includes a further test of the previous studies' expectations, but with a different sort of congruity: cultural congruity.

Under conditions of moderate congruity, however, we expect that evaluations in the L1 condition will be superior to L2. This is because processing of L1 sites is enhanced by a moderate level of congruity, and the site is neither too unchallenging nor too difficult. However, as described by the RHM, conceptual processing of L2 stimuli is less likely than L1 processing, so a moderate congruity level may not be sufficient to facilitate L2 processing. Indeed, lack of total congruity represents a significant hurdle for L2 processing, so we expect superior results from L1 sites. This expectation is consistent with the findings of recent research for bilinguals' memory of advertising claims under conditions of moderate congruity (Luna and Peracchio 2001b). We predict that moderate congruity will not reach a facilitatory threshold beyond which factors such as cultural congruity aid L2 processing. Therefore, moderate-congruity L1 sites should result in higher levels of A_{site} and A_{products} than moderate-congruity L2 sites.

As with our expectations in studies 1 and 2, we do not expect that low cultural congruity will aid L2 processing. However, L1 processing may occur successfully even in the absence of facilitatory cues. Therefore, as in studies 1 and 2, we predict that low congruity will lead to L1 sites generating attitudinal results that are superior to those generated at L2 sites.

Several additional measures are also analyzed in Study 3. These measures are expected to follow a similar pattern to the main attitudinal measures. The measures are website informativeness, time distortion, and telepresence. According to Hoffman and Novak (1996), these constructs are important in that they lead to a state of flow, which is characterized by a positive site navigation experience and may itself lead to desirable consequences for marketers. Computer-mediated environments like the World Wide Web have a unique characteristic: interactivity. In such an environment, individuals may reach a state in which their attention is focused solely on the universe contained within the boundaries of their network navigation experience. This state is frequently evidenced by comments such as “I forgot where I was,” or “I completely lost track of time.” This state has been labeled *flow* in previous research (e.g., Csikszentmihalyi and LeFevre 1989).

The capacity of an e-commerce site to induce a state of flow in its visitors is an important attribute. Prior research exploring flow in the general context of Web navigation has found that some of the key consequences of flow for individuals are increased learning, exploratory and participatory behaviors, positive subjective experiences, a perceived sense of control over their interactions in the computer-mediated environment, and even intentions to revisit and purchase from the site (Hoffman and Novak 1996; Luna and Peracchio 2001a; Novak, Hoffman, and Yung 2000). In this research we focus on items that are part of the flow experience: the extent to which site visitors experience the time distortion and telepresence characteristic of flow. (Time distortion refers to visitors losing track of time while navigating the site. Telepresence refers to visitors losing track of the reality around them while navigating through the site and “existing” exclusively in the virtual universe.)

Method

The experimental website was similar to the one used in studies 1 and 2. It was a fictitious camera retailer’s site that included 20 pages and 17 different pictures. The site had several sections, all accessible from a menu embedded in every page of the site. The sections were Home, Our Cameras (in which each camera had links to two pages, a benefits page and a specifications page), Testimonials, Our Cameras and You (depicting situations in which the cameras could be used), a contact form for subjects to e-mail the company, and a search engine.

Cultural congruity was created by varying the site’s content. Text and graphics were manipulated to create the three levels of congruity. Study 3 was conducted in Spain with subjects bilingual in Spanish and English. The text was designed to be either culturally U.S.-specific or Spain-specific. The graphics were designed to be culturally U.S.-specific, Spain-specific, or neutral to both cultures. The resulting congruity conditions were as follows: Spain text, Spain graphics (high congruity); Spain text, neutral graphics and U.S. text, neutral graphics (moderate congruity); and U.S. text, U.S. graphics (low congruity). Because the moderate conditions did not differ significantly from each other with respect to the key dependent measures ($F_s < 1$), they were collapsed into one single moderate-congruity condition.

Text-based cultural congruity was created by using cultural information that was typical of and specific to each culture. For example, the Spanish-specific text of the

website included a page in which the value of extended-family orientation was emphasized, while its U.S.-specific equivalent focused on fraternization with campus roommates. A symbol included in the Spanish-specific site was a paella, while its U.S.-specific equivalent mentioned a barbecue. A culture-specific hero mentioned in the Testimonials section of the Spanish-specific site was Penélope Cruz (the study was conducted prior to her success in the United States), while the U.S.-specific equivalent was Helen Hunt. A ritual included in the Spanish-specific site was the Feast of the Three Kings, while the U.S.-specific site described a Thanksgiving dinner. The text of each of the pages in the site was developed through focus groups in Spain and the United States. Care was taken that the structure, length, and descriptive and narrative content of the text were equivalent across cultural versions. Pretesting of the two versions of the text revealed (on 7-point scales for which higher scores meant higher cultural typicality) that Spanish subjects perceived the Spanish-specific version of the site as more typically Spanish than the U.S.-specific version ($\bar{X} = 4.55$ versus $\bar{X} = 2.85$; $F(1,38) = 19.79$, $p < .001$).

The graphics of each of the three picture versions of the site were selected by a panel of individuals familiar with both U.S. and Spanish culture through an iterative process similar to that used to find graphics for studies 1 and 2. The final graphics included in the sites were tested on 7-point scales for several factors: both the neutral and the culture-specific versions had similar levels of graphic congruity ($\bar{X}_{\text{neutral}} = 3.99$, $\bar{X}_{\text{Spain}} = 3.62$, $\bar{X}_{\text{USA}} = 4.01$; $F_s < 1$) and all were similarly attractive ($\bar{X}_{\text{neutral}} = 3.66$, $\bar{X}_{\text{Spain}} = 3.87$, $\bar{X}_{\text{USA}} = 4.02$; $F_s < 1$). The graphics were also rated for their cultural typicality on a 7-point scale, with higher scores meaning higher Spanish typicality. The results suggest that the culturally Spanish graphics were considered more typical of a scene in Spanish people's real life than the neutral graphics ($\bar{X} = 5.58$ versus $\bar{X} = 4.31$; $F(1,19) = 4.74$, $p < .05$) and the neutral graphics were considered more typical of a Spanish scene than the culturally U.S. graphics ($\bar{X} = 4.31$ versus $\bar{X} = 2.89$; $F(1,19) = 4.04$, $p < .05$).

The procedure and subjects were similar to those used in studies 1 and 2. The subjects were 142 Spanish-English bilinguals in Spain. They were all students at a large public university; 52.5 percent were males, and the mean age was 22.65. All of them had used the Web before, and 83.1 percent of them used it at least one hour per month. The average rating on the 5-point Spanish (L1) scale was 4.91, and the English (L2) average rating was 3.26. All subjects spoke Spanish as their native language and were proficient in English, scoring 2.50 or above on their L2 language questionnaire. However, they were all more proficient in Spanish than in English, as shown by a paired t -test ($t(141) = 26.65$, $p < .001$). Informativeness was measured by two 7-point Likert scales (the site was informative; the site presented a lot of information). Telepresence was measured by six 7-point Likert scales and time distortion by two 7-point Likert scales adapted from Novak, Hoffman, and Yung (2000). We expected that these measures would follow patterns similar to those shown by our main attitudinal measures.

Results and Discussion

As with studies 1 and 2, we performed a check for processing difficulty of L1 versus L2 sites. As expected, there was a main effect of language such that subjects perceived the L2 sites to be more effortful to process than the L1 sites ($\bar{X} = 2.08$ versus $\bar{X} = 1.69$; $F = 3.70$, $p < .05$). No other effects were significant ($F_s < 1$). This finding validates the predictions of the Revised Hierarchical Model and echoes the results of studies 1 and 2.

The results were analyzed as a 2 x 3 (L1 and L2; low, moderate, and high cultural congruity) between-subjects factorial design. Table 2 includes the means and standard deviations for the measures analyzed in this study.

Table 2. Study 3: Means for All Measures*

	Low cultural congruity		Moderate cultural congruity		High cultural congruity	
	L1	L2	L1	L2	L1	L2
A_{site}	3.62 (1.16)	3.89 (1.38)	3.73 (1.31)	3.72 (1.39)	3.31 (1.24)	2.92 (1.37)
A_{products}	4.95 (1.46)	4.68 (1.43)	5.28 (1.05)	4.72 (.86)	4.43 (1.24)	5.40 (1.03)
Total thoughts	.42 (.77)	.23 (.65)	.24 (.76)	.44 (1.60)	.00 (.00)	.00 (.00)
Positive minus negative thoughts	.17 (.79)	.10 (.56)	.00 (.73)	.00 (.31)	.00 (.00)	.00 (.00)
Time distortion	3.38 (1.88)	3.98 (1.95)	3.54 (1.70)	3.37 (1.60)	2.42 (1.40)	3.62 (1.84)
Informativeness	4.34 (1.30)	4.61 (1.73)	4.85 (1.31)	4.55 (1.27)	3.73 (1.78)	4.83 (.94)
Telepresence	2.16 (1.30)	2.34 (1.26)	2.00 (1.25)	2.01 (1.27)	1.27 (.66)	2.56 (1.45)
Seconds per page	53.79 (21.11)	52.09 (26.70)	52.37 (23.21)	46.58 (17.79)	55.95 (27.15)	63.56 (21.35)

*Standard deviations are in parentheses.

Table 3. Study 3: Correlations among Variables

	A _{site}	A _{products}	Total thoughts	Positive minus negative thoughts	Time distortion	Informativeness	Telepresence	Secs / page
A _{site}	—							
A _{products}	.36**	—						
Total thoughts	.07	.07	—					
Pos. – neg. thoughts	.14	.04	.05	—				
Time distortion	.44**	.33**	.15	.07	—			
Informativeness	.54**	.51**	-.06	.11	.35**	—		
Telepresence	.32**	.32**	.13	.04	.59**	.26**	—	
Seconds per page	-.27**	-.11	.28**	-.03	-.21*	-.27**	.05	—

** Correlation is significant at the .01 level

* Correlation is significant at the .05 level

Our analysis of the attitudinal data revealed that for A_{site}, the two-way interaction between language and cultural congruity was not significant ($F < 1$). However, we observed a marginally significant main effect of cultural congruity on A_{site} ($F(1,139) = 2.35, p < .10$). Thus, high-congruity sites resulted in lower site evaluations than moderate- and low-congruity sites ($\bar{X} = 3.13$ versus $\bar{X} = 3.74$; $F(1,139) = 4.71, p < .05$). The lack of language effects on this measure is perhaps due to the simpler design of the site and the more prominent place that the products sold by our fictitious camera e-tailer occupied in the design of the site for this study.

For A_{products}, however, the two-way interaction between language and cultural congruity was significant ($F(2,136) = 4.25, p < .01$). In the high-cultural-congruity condition, L2 resulted in higher product evaluations than L1 ($\bar{X} = 5.40$ versus $\bar{X} = 4.43$; $F(1,139) = 4.69, p < .05$). In the moderate-congruity condition L1 was superior to L2 ($\bar{X} = 5.28$ versus $\bar{X} = 4.72$; $F(1,139) = 4.04, p < .05$). Replicating the product evaluation findings of studies 1 and 2, in the low-congruity condition there was no difference between L1 and L2 ($F < 1$). Hence, for both types of congruity (graphic and cultural), low congruity seems to hamper cognitive elaboration even in subjects' L1.

The total-thoughts measure revealed a marginally significant effect such that more thoughts were produced by subjects under the low- and moderate-cultural-congruity conditions than under the high-congruity condition ($\bar{X} = .33$ versus $\bar{X} = 0.00$; $F(2,139) = 2.66, p < .10$). This finding is consistent with the A_{site} results and may be an indication of an attempt to process information that does not totally conform to subjects' cultural schemas. No other effects were significant for total thoughts. Similarly, the measure of the number of positive minus negative thoughts did not produce any significant results ($F_s < 1$), perhaps because subjects did not write down as many thoughts in this study as in studies 1 and 2. (A possible reason for this was that the box in which subjects had to write their thoughts in the first two studies was located at the end of the questionnaire and was not

followed by any other scales, whereas in Study 3 it was placed before several other scales.)

Consistent with Study 2, the time that visitors spent per page indicates that high congruity leads to more extensive processing of L2 sites. High-congruity L2 sites lead to more time spent per page than low- and moderate-congruity L2 sites ($\bar{X} = 63.56$ versus $\bar{X} = 48.89$; $F(2,139) = 3.99, p < .05$). No other effects were significant for this measure ($F_s < 1$).

With respect to the additional measures analyzed in this study, we found a significant (or marginally significant) superiority of L2 sites over L1 sites in the high-congruity condition for informativeness ($F(2,139) = 3.79, p < .05$), telepresence ($F(2,139) = 6.70, p < .01$), and time distortion ($F(2,139) = 2.97, p < .10$). This L2 superiority in high-congruity conditions suggests that visitors are challenged to process such sites and that they are more likely than visitors to equivalent L1 sites to lose track of time and the world around them. They are also more likely to perceive the sites as more informative than are visitors to equivalent L1 sites. For moderate- and low-congruity sites there were no differences due to language ($F_s < 1$).

A topic of interest that remains unexplored is the relationship between congruity, language, A_{products} , and the flow-related measures. We might expect attitudinal measures to mediate the relationship between site design factors (congruity and language) and flow-related measures. Only if consumers have a positive reaction to the site's content will they have a positive navigation experience (Lazarus 1991; Luna and Peracchio 2001a). An alternative model might suggest that the flow-related variables mediate the effect of site design factors on A_{products} . To examine whether A_{products} indeed mediates the effect of site design content and flow-related variables, we performed a step-down analysis (Bagozzi and Yi 1989; Nyer 1997). We ran three analyses of variance: The first analysis included only the site design factors as predictors of telepresence, time distortion, and A_{products} . The results of this MANOVA show a main effect of language ($F = 2.71, p < .05$). However, this main effect is qualified by a significant interaction of congruity and language ($F = 2.67, p < .05$). There was not a main effect of congruity ($F < 1$). This step shows that site design factors influence both attitudes and the flow-related measures.

The next step was to include A_{products} as a covariate and have only telepresence and time distortion as dependent variables. The results of this MANCOVA show that the interaction between congruity and language loses its significance ($F < 1$). Similarly, congruity is not significant ($F < 1$). There was, however, a main effect of language ($F = 4.06, p < .05$) and A_{products} ($F = 13.04, p < .001$). This step shows that when attitudes are used to predict flow-related measures, the interaction between congruity and language loses its effect on the flow-related measures. However, language still seems to affect flow-related measures directly. These results suggest that attitudes directly influence flow-related measures, and that attitudes at least partially mediate the interactive effect of site design factors on the flow-related measures. This step also follows Baron and Kenny's (1986) recommendations to test for mediation effects. To further follow Baron and Kenny, we ran the model described in this step but without A_{products} as a covariate. Supporting our

expectation that site design influences flow-related variables, the results show that the interaction between congruity and language is significant ($F = 2.90, p < .05$).

Finally, we ran an ANCOVA with A_{products} as the dependent variable, site design factors as predictors, and telepresence and time distortion as covariates. We see in this analysis that the interaction between congruity and language becomes significant ($F = 3.03, p < .05$), as are the main effects of time distortion ($F = 5.51, p < .02$) and telepresence ($F = 6.16, p < .01$). Both the main effects of language and congruity are not significant ($F = 1.15, p > .28$, and $F < 1$, respectively). This step shows that although language may directly influence the flow-related measures, it does not seem to have a main effect on attitudes—we need to consider language in combination with congruity. More importantly, however, this step suggests that attitudes, not flow-related measures, are directly related to site design factors, so it is attitudes that mediate the effect of site design on flow-related measures, not flow-related measures that mediate the effect of site design on attitudes. To confirm this finding, we evaluated the last analysis suggested by Baron and Kenny (1986), which involves modeling A_{products} as a function of site design factors only. As previously indicated in this section, that analysis revealed a significant interaction between congruity and language ($F = 4.25, p < .01$). In conclusion, our step-down analysis shows that A_{products} mediates at least partially the effect of site design factors on flow-related variables. This conclusion is also supported by an analysis following Baron and Kenny (1986).

The results of this study provide evidence for the moderating role of cultural congruity on language processing. As with graphic congruity in studies 1 and 2, high cultural congruity results in enhanced A_{products} for L2 versus L1 individuals. Congruity, therefore, regardless of the type, can lead to enhanced persuasion in L2 conditions. However, while studies 1 and 2 found that graphic congruity moderates language effects on A_{site} and A_{products} , Study 3 did not find a significant interaction between language and congruity for A_{site} . This result should be kept in mind and suggests that factors not included in this study, such as the relative complexity and sophistication of the site, may have an impact on site evaluations.

The results of Study 3 are also consistent with previous research on the impact of language on advertising recall (Luna and Peracchio 2001b). That research suggests that L2 processing does not benefit from moderate levels of congruity. While L1 processing is enhanced by moderate congruity, L2 requires a higher level of congruity before it can reap benefits.

Conclusions

In this paper, we suggested that congruity facilitates second-language processing and enhances attitudinal measures for L2 websites relative to L1 websites. We examined two types of congruity, graphic congruity and cultural congruity, using Web design elements. Our empirical studies revealed that both types of congruity moderate language effects on attitudinal variables such that persuasion is enhanced after exposure to congruent second-language websites.

Our results extend existing psycholinguistic research with bilinguals by suggesting that attitudinal variables are influenced by language. Specifically, we examined the implications of a widely accepted model of language processing, the Revised Hierarchical Model, for evaluative processes. Our findings indicate that both high graphic and cultural congruity enhance evaluations of second-language stimuli relative to first-language stimuli. Perhaps because second-language ads are intrinsically more effortful to process than first-language ads, high-congruity websites provide bilinguals with the necessary tools for successful processing, resulting in enhanced evaluations.

Our research extends recent findings in consumer behavior that explored the effects of matching advertising appeals with consumers' cultural values (Aaker and Sengupta 2000). The finding that second-language processing can be enhanced by both cultural and graphic congruity suggests that cultural congruity can be studied and understood in information-processing terms. For example, the availability of certain cultural-specific schemas can facilitate the processing of congruent information, as in our L2 congruent condition.

This research also has implications for the study of the effect of language on information processing. MacInnis and Jaworski's (1989) advertising-effects framework specifies that an important moderator of information processing is processing ability. They define ability as "skill or proficiency in interpreting brand information in an ad" (p. 7). This view is consistent with the Elaboration Likelihood Model of persuasion, which also assigns an important role to ability to process (Petty and Cacioppo 1986). Our research suggests that an important indicator of a bilingual individual's ability to process is the language in which a message is presented.

Particularly relevant to practitioners are our findings that L2 websites can elicit even higher site and product evaluations than L1 sites under some conditions. Thus, if the site includes relevant graphics, which support the content, or includes content that is consistent with consumers' cultures, e-marketers may not need to translate their sites into the local languages. However, while our results support this conclusion when attitudinal responses are the focus of the e-marketers' actions, caution should be applied if other types of responses are desired, such as purchases or comprehension.

Future research must examine other dependent measures, such as memory, intentions, and purchase behavior. Additionally, measures recently developed to assess

website effectiveness, such as flow—the achievement of an optimal navigation experience (Novak, Hoffman, and Yung 2000)—should also be examined in connection with studies exploring language and congruity. Our analysis of the telepresence and time distortion measures begins to address the construct of flow, and our findings offer some preliminary evidence that the flow construct can be applied to and measured in specific websites to assess their effectiveness, particularly in cross-cultural contexts. Regarding our examination of graphic congruity, it may be interesting to explore whether graphic congruity with the domain or topic of a website also impacts attitudinal measures, and how often incongruity actually occurs in real e-marketing sites.

Future studies also need to examine languages other than English and Spanish. For example, it is possible that the use of ideographic or logographic languages may have different implications from the ones presented in this research (Tavassoli 1999). Another possible avenue for further research is an examination of high-versus low-proficiency bilinguals. In our studies we included relatively proficient bilinguals. This population is normally the focus of bilingual research in consumer research and psycholinguistics, and it is representative of international Web users, at least currently. A question of interest for future studies is whether less-fluent individuals are helped to a lesser degree by congruity during L2 processing. Finally, future research needs to address the possible domain- or context-specificity of language. For instance, some consumers may find English to be the standard language of the Internet and may not respond well to sites in their local languages. It may be that consumers have established scripts for processing information on the Web and processing information in English has become a central part of those scripts.

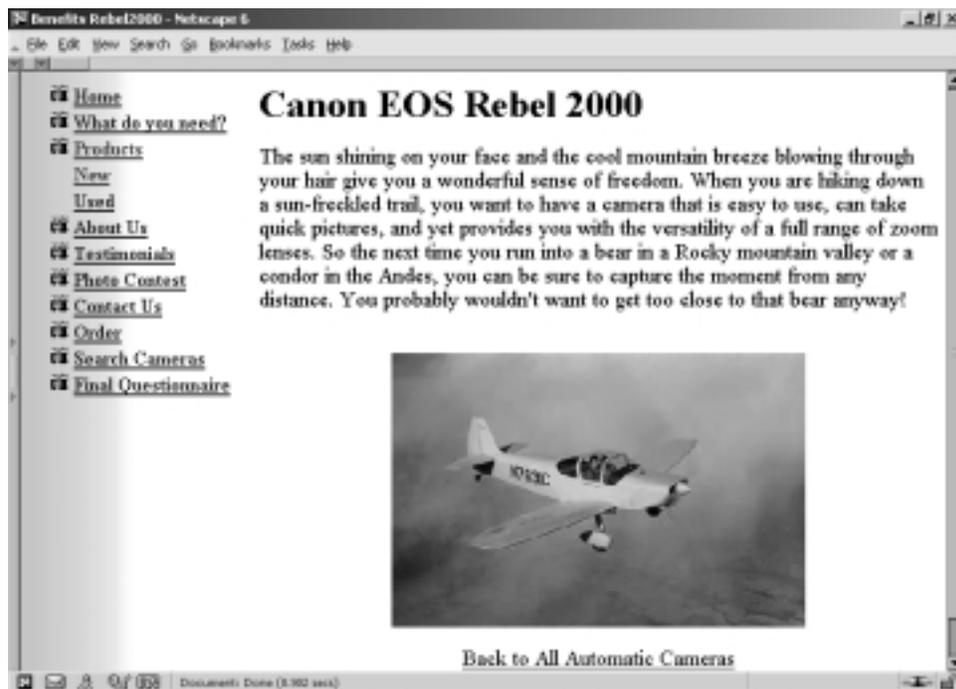
In conclusion, our empirical exploration begins to examine how bilingual consumers process information online and form attitudinal assessments. Our results are of particular significance because we build into our model a cross-cultural dimension, which is very important for a global medium like the Internet. However, a great deal of research is still necessary for a complete understanding of international and bilingual site-surfing behavior.

Appendix: Sample Graphics

High-graphic-congruity page, studies 1 and 2



Low-graphic-congruity page, studies 1 and 2



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