

Internet Motives of Users in the United States, United Kingdom, Australia, and Korea: A Cross-Cultural Replication of the WMI

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Abstract

The Web Motivation Inventory (WMI) is used in academic research and is cited in the academic Internet advertising literature. To date, the scale has only been tested on U.S. consumers. This research replicates the WMI using consumers from the United States, United Kingdom, Australia, and South Korea. Our findings revealed the same four-factor structure for three of the four countries, providing evidence of the scale's global stability. However, the four motives--research, communicate, surf, and shop--differed significantly among the countries.

Introduction

Motives drive consumers' use of and response to Internet advertising and marketing, motives can be used to make predictions about web-related attitudes and behaviors (Rodgers and Cannon 2000). Although a number of Internet usage studies have been conducted in the United States, very little is known about Internet motives in other countries. Yet Internet marketers who understand the motives of consumers from different countries can make better use of this global medium since culture affects perception, attitudes, behavior and ultimately, responsiveness to marketing activity (Rettie 2002).

In addition to understanding Internet motives cross-culturally, there are calls for more replications in marketing (Hubbard and Armstrong 1994; Leone and Schultz 1980), and replication studies are needed to examine the validity of motivation as a theoretical construct (Hunter 2001). The current study proposes to fill this gap by replicating an existing Internet motives scale, the Web Motivation Inventory (Rodgers and Sheldon 2002), in four countries: the United States, United Kingdom, Australia, and South Korea.

Since the WMI was developed in the United States and has only been tested on U.S. consumers, the next logical step is to determine whether the same four-factor structure emerges in non-U.S. countries. The results are then used to assess the validity of the WMI and determine what, if anything should be updated or changed to make the scale useful in countries other than the United States.

The Web Motivation Inventory

Recent Internet advertising research has examined Internet motives with regard to information processing (Rodgers 2002) and Rodgers and Thorson (2001) have created a model that accounts for the role of Internet motives in audience processing. More than 100 web motives have been identified (Rodgers and Sheldon 2002), including acquiring information (Eighmey 1997), chatting or emailing (Stafford and Stafford 2001), and shopping (Maignan and Lukas 1997). Several scholars have provided reviews of this body of research and, out of this effort, several scales have been created to measure Internet motives (e.g., Korgaonkar and Wolin 1999) and a number of useful typologies have been created as well (e.g., Sheehan 2002).

One of the existing scales developed specifically to measure Internet motives, the Web Motivation Inventory (WMI), was selected for our replication. The WMI has been widely utilized in online advertising studies (e.g., Cannon 2001; Coe 2004; Faber, Lee, and Nan 2004; Yoon, Cropp, and Cameron 2002; Youn and Lee 2005). The WMI is the product of a series of studies that took place over a five-year period between 1997 and 2001. Rodgers and Sheldon (2002) identified four primary motivations for Internet use, which included researching, communicating, surfing, and shopping, and identified 12 items to assess the four motives (three items for each motive). The WMI has since been tested and retested and has been shown to organize Internet motives into four reliable and valid factors including shop, research/acquire information, communicate/socialize, and surf.

Although the four motives have replicated consistently across a variety of student and non-student adult samples, the WMI has not been tested on non-U.S. subjects (Rodgers and Sheldon 2002). However, it is important to conduct cross-validations of scales in which the measurement validity is computed on different samples from that on which the items were selected, because any validity coefficient computed on the same sample that was used for item-selection purposes will capitalize on random sampling errors within that particular sample and will subsequently be spuriously high (Anastasi 1982). Thus, the first research question that we addressed was:

RQ1: To what extent does the WMI replicate in non-U.S. countries and, specifically, does the same four-factor structure emerge in U.S. and non-U.S. countries?

Cross-Cultural Comparison of Four Countries

The four countries examined here were the United States, United Kingdom, Australia, and South Korea. According to Internet-World-Stats (2003), these four countries are among the top 13 countries in the world with the highest percentage of Internet usage penetration. The United States ranks first with 165.75 million online users, or 59% Internet use penetration, the United Kingdom ranks fifth with 34.3 million online (57%), South Korea ranks sixth with 25.6 million Internet users (54%), and Australia ranks thirteenth with 10.63 million Internet users, or 54% of the population (NUA 2003).

However, despite commonalities as industrialized countries and similarities in Internet use, the four countries are also somewhat different in terms of culture and other factors. A lengthy discussion of these differences is beyond the scope of the current study, but a few highlighted points seem warranted. For example, although three of the countries are Anglo-heritage English-speaking countries, Australia is unique in the relative geographical isolation of its population and in its smaller population/market relative to all the other countries in this study. Even the United Kingdom and United States have important differences, such as the United Kingdom's compact size, European connection, and great influence of its long history. Thus, while cultural and other differences are not as great between the three English-speaking countries as between the more dramatic East-West comparisons such as the United States versus South Korea, it may be incorrect to assume that even common Anglo-heritage countries will use the Internet for the same reasons.

As noted by Anastasi (1982), cultural differences may operate in many ways to bring about group differences in behavior. The level at which cultural differences are manifested varies along a continuum extending from superficial and temporary effects to those that are basic, permanent, and far-reaching (Anastasi 1982). From both a theoretical and practical standpoint, it is important to inquire at what level of this continuum any observed behavioral and motivational differences fall. Thus, another key concern of this study was to examine the differences in Web motivation among the four different cultural groups to determine the scale's stability in cultures other than the United States.

Thus, in addition to examining whether the scale replicates consistently across the four countries, we will examine whether there are significant differences among the countries with regard to the four motives, which will serve as an additional test of the scale's external validity, or ability to be generalized or used in countries outside the United States. This translates to the second and final research question:

RQ2: To what extent is the scale able to detect differences in Internet motives among the four countries?

Method

Participants

A pen and paper survey of the 12 items comprising the Web Motivation Inventory was administered to undergraduate students at four universities in the United States (N = 185, male = 39.7% and female = 60.3%), England (N = 337, male = 47.8% and female = 52.2%), Australia (N = 129, male = 30.9% and female = 69.1%) and South Korea (N = 108, male = 65.7% and female = 34.3%). Although a student population is not representative of the general population, students have high Internet familiarity and provide sufficient homogeneity to facilitate cross-cultural comparisons.

Our decision to use student samples is also theoretically justified, since students comprise a large percentage of Internet users worldwide and therefore represent an important segment for marketers. Thus, from a theoretical standpoint it is interesting to examine whether or not students in different parts of the world are motivated to use the Internet in the same way. Methodologically speaking, students provided a comparable platform on which to examine the Internet motives of different groups or cultures.

Measurement Invariance

An important issue in scale development and testing is the need to establish a common measurement scale across groups, which involves full or partial measurement invariance of trait indicators (Reise, Widaman, and Pugh 1993). Much research has been motivated by questioning how to establish whether an inventory measures the same trait dimension, in the same way, when applied to two or more qualitatively distinct groups. As Reise, Widaman, and Pugh (1993) noted, to compare groups of individuals with regard to their level on a trait, or to investigate whether trait-level scores have differential correlates across groups, one must assume that the numerical values under consideration are on the same measurement scale (Drasgow 1984, 1987 cited in Reise, Widaman, and Pugh 1993). One must further assume that the test has "measurement invariance" across groups, because if trait scores are not comparable across groups, the differences between groups in mean scores or correlation patterns are potentially artificial and may be misleading (Reise, Widaman, and Pugh 1993).

As Reise, Widaman, and Pugh (1993) suggest, the primary approach to addressing measurement invariance involves the study of similarities and differences in the covariation patterns of item-factor relations (Windle, Iwawaki, and Lerner 1988). Thus, item means, standard deviations, and item intercorrelations for each sample were examined,

together with the coefficient alpha. We also examined whether the factor loading matrix was invariant across groups, which needed to relate to the latent variable in the same way for the four samples here.

Measurement Instrument

The Web Motivation Inventory (WMI) represents four primary Internet functions including Shopping, Surfing, Research, and Communication. The scale's items were measured on 5-point Likert scales ranging from (1) strongly disagree to (5) strongly agree. The stem, "I mostly use the Internet to:" was followed by the 12 items that comprise the WMI. Shopping was measured by the following statements: make a purchase, buy things, and purchase a product I've heard about. Surfing was measured with the statements: explore new sites, surf for fun, and find interesting web pages. Research was measured with these items: do research, get information I need, and find out things I need to know. The items for communication included: connect with my friends, communicate with others, and email other people.

Cultural Equivalence

Cultural equivalence—whether constructs have similar meaning from one culture to the next—is an important consideration in scale replication. Psychometric researchers argue that cultural equivalence requires thoughtful analysis of the meaning of items measured in the inventory (Helms 1992). Web motivation, as a key construct in understanding online consumers' attitudes and behaviors, and the cultural equivalence of its meaning was assessed using linguistic equivalence. This meant that the language in the inventory was equalized so that it had the same meaning to different cultural groups (Helms 1992). We accomplished this by sampling only English-speaking subjects from four countries—United States, United Kingdom, Australia, and South Korea. However, it is possible that the inventory items may be interpreted differently by individuals whose first language is Korean as compared to English. Therefore, it was decided to translate the WMI into Korean and give the Korean translation to half of the English-speaking Korean subjects and the English translation to the other half. We then examined the two sets of data for any differences, but the results revealed none. We therefore collapsed the data from the English- and Korean-versions of the WMI and reported the findings for Korea as a whole.

Findings

The data were analyzed using factor analysis, a technique that is used to test the dimensionality of the measure of a theoretical construct, and to make decisions about whether the scale is valid and reliable (Bollen and Lennox 1991). Factor analysis with a Varimax rotation produced the same four-factor structure across the three English-speaking countries (see Table 1). When principal factor analysis, followed by Varimax rotation was applied to the data for Australia, United Kingdom and the United States, respectively, four factors emerged with eigenvalues greater than 1.00 for each sample. For the Australian sample, the resulting Internet motives and their alphas were: research ($\alpha = .74$), communicate ($\alpha = .78$), shop ($\alpha = .90$), and surf ($\alpha = .84$). The combined items explained 75 percent of the total item variance. For the U.K. sample, the resulting motives and their alphas were: research ($\alpha = .79$), communicate ($\alpha = .75$), shop ($\alpha = .95$), and surf ($\alpha = .80$), which explained 75 percent of the total item variance. For the U.S. sample, the resulting motives and their alphas were: research ($\alpha = .81$), communicate ($\alpha = .78$), shop ($\alpha = .93$), and surf ($\alpha = .90$), which explained 79 percent of the total item variance. Thus, the first three cultural groups rendered the same factorial structure regarding the latent variable of Internet motivation, with similar patterns of factor loadings for the four dimensions, respectively.

Table 1.
Varimax-Rotated Factor Patterns of the WMI: English-Speaking Countries

Motives	Shop	Surf	Research	Communicate	Items
Australian Sample					
I use the Web to:					
Shop	.94 .95 .86				1. make a purchase 2. buy things 3. purchase a product I've heard about
Surf		.66 .91 .91			4. explore new sites 5. surf for fun 6. find interesting web pages
Research			.74 .83 .80		7. do research 8. get information I need 9. find out things I need to know
Communicate				.74 .87 .79	10. e-mail other people 11. connect with my friends 12. communicate with others
U.K. Sample					
I use the Web to:					
Shop	.95 .96 .92				1. make a purchase 2. buy things 3. purchase a product I've heard about
Surf		.73 .85 .86			4. explore new sites 5. surf for fun 6. find interesting web pages
Research			.82 .82 .81		7. do research 8. get information I need 9. find out things I need to know
Communicate				.82 .85 .76	10. e-mail other people 11. connect with my friends 12. communicate with others
U.S. Sample					
I use the Web to:					
Shop	.94 .93 .93				1. make a purchase 2. buy things 3. purchase a product I've heard about
Surf		.83 .88 .92			4. explore new sites 5. surf for fun 6. find interesting web pages
Research			.85 .83 .80		7. do research 8. get information I need 9. find out things I need to know
Communicate				.80 .80 .90	10. e-mail other people 11. connect with my friends 12. communicate with others

However, when applying principle component analysis with Varimax rotation to the South Korean sample, only three factors were initially generated (see Table 2.1). The initial analysis showed that the surf and research items loaded on the same factor.

Table 2.1
Rotated Factor Patterns of the WMI: S. Korea—Iteration 1

Motives	Surf/Research	Shop	Communicate	Items
Korean Sample				
I use the Web to:				
Surf/Research	.85			1. find interesting web pages
	.77			2. surf for fun.
	.66			3. explore new sites.
	.56			4. find out things I need to know.
	.51			5. do research.
Shop		.89		6. buy things.
		.85		7. make a purchase.
		.80		8. purchase a product I've heard about.
Communicate			.82	9. e-mail other people.
			.82	10. connect with my friends.
			.59	11. communicate with others.
			.44	12. get information I need.

An additional analysis was conducted by applying principle axis factoring, and the same three factors emerged on Factor 1 with the research items “find out things I need to know” and “do research” (see Table 2.2). However, when principle axis factoring with a 4-factor extract was employed with Varimax rotation, the four factors surfaced as we originally expected (see Table 2.3). For instance, the items “find out things I need to know” and “get information I need” loaded on the fourth factor with an eigenvalue of .90. The combined items explained 52 percent of the total item variance. The resulting motives and their alphas for the Korean sample were: research ($\alpha = .57$), communicate ($\alpha = .68$), shop ($\alpha = .82$), and surf ($\alpha = .73$).

Table 2.2
Rotated Factor Patterns of the WMI: S. Korea—Iteration 2

Motives	Surf/Research	Shop	Communicate	Items
Korean Sample				
I use the Web to:				
Surf	.90			1. surf for fun.
	.67			2. find interesting web pages.
	.52			3. explore new sites.
	.40			4. do research.
	.40			5. find out things I need to know.
Shop		.92		6. buy things.
		.75		7. make a purchase.
		.67		8. purchase a product I've heard about.
Communicate			.76	9. connect with my friends.
			.65	10. e-mail other people.
			.44	11. communicate with others.
			.37	12. get information I need.

Table 2.3
Rotated Factor Patterns of the WMI: S. Korea—Iteration 3

Motives	Shop	Surf	Research	Communicate	Items
Korean Sample					
I use the Web to:					
Shop	.93 .74 .67				1. buy things 2. make a purchase 3. purchase a product I've heard about
Surf		.89 .67 .50 .33			4. find interesting web pages 5. surf for fun 6. explore new sites 7. do research
Research			.76 .41		8. find out things I need to know 9. get information I need
Communicate				.75 .68 .43	10. e-mail other people 11. connect with my friends 12. communicate with others

To test Research Question 2, the three items for each factor were summed to create four indices, one for each motive. This procedure was repeated for each of the four countries. The resulting motives included shopping, surfing, researching, and communicating. The mean motive scores for each country can be found in Table 3. Next, we conducted a one-way ANOVA to examine whether the countries differed significantly with regard to Internet motives. Our findings revealed that the four countries differed significantly on the communication ($F = 10.18, p < .001$), shopping ($F = 23.20, p < .001$), researching ($F = 123.67, p < .001$) and surfing ($F = 69.56, p < .001$) motives. Specifically, Australians used the Internet to communicate to a greater extent than did individuals from the United Kingdom or South Korea, while Korean consumers scored highest on the shopping and surfing motives and lowest on the research motive (see Table 3).

Tukey's post hoc comparison tests were conducted to examine mean differences among the four samples. We refer the reader to Table 3, which shows the significant differences identified. Briefly, the findings revealed that Australians scored high on communication motives whereas individuals from the United Kingdom scored high on the shopping motive. South Koreans mostly used the Internet to surf, and U.S. participants were most inclined to research or look for information online.

Table 3.
Comparison of Means of Factor Scores

	Research**		Communicate**		Shop**		Surf**	
	M	SD	M	SD	M	SD	M	SD
Australia	12.92 ¹	1.91	12.74 ²	2.45	5.62	2.87	10.34	2.76
United Kingdom	12.16	2.23	11.53	2.63	6.47 ³	3.20	10.10	2.70
United States	12.17	2.66	11.81	2.97	6.21	3.57	9.82	3.27
South Korea	8.27	1.31	11.16	2.14	8.04	2.59	14.34 ⁴	2.68

Note: *p<.05, **p<.01

1. Significantly different from United Kingdom and South Korea (p < .01) but not United States
2. Significantly different from United Kingdom and South Korea (p < .01) but not United States
3. Significantly different from United States and South Korea (p < .01) and Australia (p < .05)
4. Significantly different from Australia, United Kingdom, and United States (p < .01)

Discussion and Conclusion

The results presented here add support for the psychometric soundness of the WMI, but even more so for the parsimonious WMI as a first-order four-factor instrument. In contrast to the findings of Rodgers and Sheldon (2002) that were based on U.S. consumers, this research has used a sample of consumers from the United States and three additional countries. The findings suggest that the WMI possesses the psychometric properties that are desired in a research instrument. The scale replicated consistently in the three English-speaking countries and, after some additional analyses, one non-English speaking country. In addition, the scale detected differences in Internet motives among the four qualitatively different countries, suggesting that the inventory is a valid and reliable measure of Internet motives.

Managerial Implications

Our findings have a number of implications for advertising and marketing managers who use the Internet to reach global audiences. The four dimensions of the WMI provide a range of motivational responses that can be expected from Internet users in different countries. Advertisers can use the WMI with confidence and it should be useful in determining the motives of individuals who use their websites, and these motives can be tracked over time to make changes or additions to a website to meet the changing needs or motives of a given audience. The instrument allows marketers and advertisers to determine whether a website still achieves its intended goals. The findings of the WMI have been found to be useful in the United States, United Kingdom, Australia, and South Korea, countries with arguably different market and consumer environments. Thus, based on these findings, it could be argued that the WMI is a culturally-useful research tool.

Limitations and Directions for Future Research

Despite these somewhat promising findings, a number of additional studies are needed to test the WMI cross-culturally. First, the applicability of the psychometric properties of the 12-item WMI may need further reassessment in non-English speaking countries. Although extra precautions were taken to increase linguistic equivalence among our Korean sample, the fact that the four-factor scale emerged only after additional analyses were conducted suggests that, despite our efforts, linguistic equivalence may not have been achieved. For instance, it is possible that the scale items took on a different meaning once translated into Korean. Or, alternatively, the English version of the WMI that was administered to the English-speaking Koreans may have been interpreted incorrectly. We ruled out this possibility at the beginning of our analysis when the t-test that examined differences among the English and Korean versions of the WMI did not yield any significant differences. However, it is possible that Korean consumers equated

surfing and researching—the motives that loaded on the same factor—as one in the same. Or alternatively, it may be that Koreans viewed surfing as a means of carrying out research, again suggesting a merger of the two motives. This suggests that future studies could consider the possibility of improving the WMI by rewording the items that comprise the two factors that loaded together—research and surfing.

Secondly, a limitation of this research was the use of convenience samples comprised of college students. Earlier we argued that the use of student subjects is justified since they have high Internet familiarity and provide sufficient homogeneity to facilitate cross-cultural comparisons. Still, we acknowledge that students may possess different motivations for their Internet usage than other age groups, for instance, Millennials, Gen Y and Baby Boomers. A future direction for research would be to collect more data using different samples to determine whether the items used here can be extrapolated to other samples. It is possible that the items used here for the WMI are English-speaking specific. More research is necessary to establish whether the items translate well into other languages and whether alterations in the original items are needed to maintain the psychometric characteristics in U.S. and non-U.S. consumers.

Third, although the present findings suggest that the scale is sufficiently able to make distinctions among different countries, we cannot say why these differences emerged. For instance, it is unclear why Australians scored higher on the communication motive and individuals from the United Kingdom scored higher on the shopping motive. Beyond pure speculation, from which we will refrain, additional studies are needed to better understand and explain why some countries have different Internet motives. These findings could provide insights into marketing behaviors and activities needed to meet the differing needs of individuals from different cultures.

Last, in addition to the items examined here, future studies are needed to determine whether additional motivations have emerged since the WMI's genesis in 1997. For example, an entertainment motive may need to be added to account for activities (e.g., online games) beyond surfing. This may include adopting alternative quantitative and qualitative methods to determine the comprehensiveness of the WMI with regard to Internet motives.

Conclusion

The findings of this study suggest that the Web Motivation Inventory (WMI) is a useful tool for measuring Internet motives cross-culturally. Although no four countries can fully represent all countries, the findings provide support for the psychometric soundness of the WMI, which may offer some useful theoretical and practical directions.

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