# The Web Motivation Inventory

## Replication, extension and application to internet advertising

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The Web Motivation Inventory (WMI) is used in internet advertising research, and is frequently used and cited in advertising, marketing and communication literature. Investigations of the robustness of the WMI have been somewhat limited. Additionally, new uses of the internet are not accounted for by the WMI since its publication in 2002. This paper replicates and extends the original WMI using participants in the US, UK and Australia and includes internet motives not previously examined. The results show that the four-factor WMI remained reliable and valid for all three samples. Findings suggest the extended WMI may be broken into 12 sub-scales that represent the original four-factor measure.

## Introduction

Internet advertisers in the US spent $7.9 billion during the first six months of 2006 – a 37% increase over the first half of 2005 (IAB 2006). Increase in online advertising reaffirms the internet's growing importance for advertisers and marketers who want to engage consumers and leverage branding opportunities. From search engines, behavioural targeting, consumer-generated content, broadband and new emerging platforms such as mobile and iPTV, the internet is projected to continue to increase its share of total ad spending (IAB 2006).

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Despite advances in interactive options available to internet advertisers and marketers, and a shift in spending towards these interactive venues, measuring the impact of online promotional efforts continues to be a challenge. As with traditional media, decisions made about online marketing strategies and ad expenditures must be justified to demonstrate some level of ad effectiveness. In this push for greater accountability, consumer motives for internet use have been identified as a key to understanding the effectiveness of interactive advertising strategies (Rodgers & Thorson 2000). Studies have shown that internet motives influence website effectiveness (Ko *et al.* 2005) as well as attitudes and behaviours towards internet advertising (Rodgers 2002).

Numerous scales have been developed to measure consumer motives for internet use (e.g. Korgaonkar & Wolin 1999; Papacharissi & Rubin 2000) but the Web Motivation Inventory has received particular attention by internet advertising, communication and marketing scholars in the US and internationally (e.g. Sheehan 2002; Cai & Jun 2003; Faber *et al.* 2004; Francis & White 2004; Weib 2005; LaFerle & Kim 2006). The WMI was developed out of a comprehensive review of the literature, and a number of data collections and factor analyses have been conducted on US (Rodgers & Sheldon 2002) and international samples (Rodgers *et al.* 2005). However, the scale has not always produced consistent results and new uses of the internet are not accounted for by the WMI since its inception in 1997. For the WMI to be useful, it must be updated to reflect current internet motives. The scale's unidimensionality must also be tested and validated with internet ad variables to provide a robust measure of internet motives that is useful to internet advertisers and marketers.

This research replicates and extends the WMI, where replication broadly refers to a duplication of a target study and an extension is duplication with the alteration of one or more key parameters (Berthon *et al.* 2003). This was accomplished with two studies. Study 1 replicates the WMI with a survey of internet users from the US, UK and Australia. Study 2 replicates and extends the original WMI to include 'new' internet motives; the extended version of the WMI is validated with confirmatory factor analysis and internet ad-specific items. The paper begins with a brief review of the WMI and then compares it to other similar measures to assess the scale's properties. An overview is then provided about analyses to be conducted to examine the WMI's reliability and validity, and to

evaluate the scale's psychometric properties. The paper concludes with future research possibilities.

## Internet motives: instrument evaluation

### *Web Motivation Inventory*

The Web Motivation Inventory (WMI) quantifies four primary internet motives on 12 five-point Likert scales (Rodgers & Sheldon 2002). The four motives are: research (information acquisition), communicate (socialisation), surf (entertainment) and shop. The instrument was developed out of a series of data collections, factor analyses, and reliability and validation techniques. Study 1 synthesised more than 100 internet motives from the literature, and conducted qualitative interviews with internet users and categorised these into four motives (see Rodgers & Sheldon 2002). Study 2 purified the instrument and narrowed the number of scale items from 15 to 12 using five-point Likert scales. Study 3 cross-validated the WMI using a student sample and Study 4 cross-validated the WMI using a non-student sample. The four-factor structure remained stable across both samples. Study 5 tested the temporal stability of the WMI with a test–retest procedure that administered the scale at two different times to the same participants over a six-week period. All but the communication factor remained stable over the six weeks. Study 6 validated the WMI using a student sample. Individuals filled out the WMI and were exposed to 12 banner ads, three for each of the four motives, and rated the banners on ten five-point semantic differential scales that measured liking, persuasion and intent to click. Three of the four motives successfully predicted at least one of the dependent variables except for communication. Study 7 validated the WMI with the same procedures as in Study 6 using a non-student sample. Three of the four motives successfully predicted at least one of the dependent variables except for surfing (Rodgers & Sheldon 2002).

A replication of the WMI was published in 2005. The 12-item WMI was administered to four groups of students in the US, UK, Australia and South Korea. The scale was translated into Korean and half of the Korean students were given the English and half the Korean version. Factor analysis was conducted with Varimax rotation, as were coefficient alphas.

The four-factor structure emerged consistently across all but the Korean sample; two of the motives, namely research and surf, loaded on the same factor for this sample.

Notwithstanding its use and scale development procedures, the WMI has not yielded consistent results for every study in which it was examined. Investigations of the robustness of the WMI also have been somewhat limited. In all iterations noted above, principal component factor analyses with Varimax rotations were conducted, as were reliability tests using alpha coefficients. Factor analysis and coefficient alphas are needed but are not a sufficient test for the validation of an instrument; confirmatory factor analysis is also needed to assess the unidimensionality of a measure to determine the scale's acceptability (Gerbing & Anderson 1988).

To further assess the WMI's properties and identify possible new motives not currently measured by the scale, we compared the WMI to similar internet motives scales. A broad search of the literature was conducted across disciplines such as advertising, marketing, computer science and mass communication to identify scales for possible inclusion. Dozens of studies were located that identified and/or examined internet motives, also called uses and gratifications of the internet, defined as general dispositions that influence people's inner desires to actively fulfil a need or want (Deci & Ryan 1985; Papacharissi & Rubin 2000). We limited our discussion to nine instruments based on three criteria: (1) instrument development was a major focus of the research; (2) individual scale items were identified and were predominantly focused on internet motives; and (3) internet motives were measured in a general (e.g. internet as a whole) vs specific context (e.g. email, eWOM, travel). To avoid repetition, measures that used or adapted existing internet motive scales were also excluded (e.g. Parker & Plank 2000; Sheehan 2002; Amiel & Sargent 2004). This helped to narrow the universe of scales and provided measures that were sufficiently similar to the WMI to make comparisons. Table 1 summarises the nine scales that met our criteria.

The scales are listed in chronological order starting with Eighmey's (1997) user perceptions of commercial websites measure and ending with Song *et al.*'s (2004) internet gratification factors. The number of items per scale ranged from 12 (Rodgers & Sheldon 2002) to 41 (Korgaonkar & Wolin 1999). Likert and semantic differential scales were employed by the

**Table 1: Internet motives instrument evaluation**

| Instrument name | Dimensions | Number of items | Scale type* | Reliability | Validity checks | Method of analysis | Author(s) | Year | Journal | Replication(s) |
|---|---|---|---|---|---|---|---|---|---|---|
| User perceptions of commercial websites | Six factors:<br>1. Marketing perceptions<br>2. Entertainment value<br>3. Informational value<br>4. Ease of use<br>5. Credibility<br>6. Interactivity | 14 | SD | No | No | Factor analysis | Eighmey | 1997 | Journal of Advertising Research | Not found |
| Uses and gratifications perspective of websites | Nine factor themes:<br>1. Entertainment value<br>2. Personal involvement<br>3. Personal relevance<br>4. Information involvement<br>5. Clarity of purpose<br>6. Controversy<br>7. Credibility<br>8. Interest in continuing communication<br>9. Purchase interest | 15 | SD | No | No | Factor analysis | Eighmey & McCord | 1998 | Journal of Business Research | Not found |
| Gratifications and concerns | Seven factors:<br>1. Social escapism<br>2. Transaction-based security and privacy concerns<br>3. Information<br>4. Interactive control<br>5. Socialisation<br>6. Non-transactional privacy concerns<br>7. Economic | 41 | LIK | 0.65–0.91 | No | Factor analysis | Korgaonkar & Wolin | 1999 | Journal of Advertising Research | Not found |
| Internet motives & electronic media | Five factors:<br>1. Interpersonal utility<br>2. Pass time<br>3. Information seeking<br>4. Convenience<br>5. Entertainment | 27 | LIK | 0.78–0.93 | No | Factor analysis | Papacharissi & Rubin | 2000 | Journal of Broadcasting | Not found |

(continued)

**Table 1: Internet motives instrument evaluation (continued)**

| Instrument name | Dimensions | Number of items | Scale type* | Reliability | Validity checks | Method of analysis | Author(s) | Year | Journal | Replication(s) |
|---|---|---|---|---|---|---|---|---|---|---|
| Motivations for communication technology use | Ten clusters:<br>1. Information<br>2. Learn<br>3. Play<br>4. Leisure<br>5. Persuasion<br>6. Social bonding<br>7. Relationship management<br>8. Problem solving<br>9. Status<br>10. Insight | 21 | SD | No | No | Cluster analysis | Flanagin & Metzger | 2001 | Human Communication Research | Not found |
| General consumer motives for accessing commercial areas of the web | Five factors:<br>1. Search<br>2. Cognitive<br>3. New and unique<br>4. Social<br>5. Entertainment | 25 | SD | 0.73–0.82 | No | Factor analysis | Stafford & Stafford | 2001 | Information Resources Management Journal | Not found |
| Web Motivation Inventory (WMI) | Four factors:<br>1. Shop<br>2. Surf<br>3. Research<br>4. Communicate | 12 | LIK | 0.70–0.93<br>Test–retest | Yes | Factor analysis | Rodgers & Sheldon | 2002 | Journal of Advertising Research | Rodgers *et al.* 2005 |
| Expected outcomes | Six factors<br>1. Activity outcomes<br>2. Monetary outcomes<br>3. Novel outcomes<br>4. Social outcomes<br>5. Self-reactive outcomes<br>6. Status outcomes | 29 | SD | 0.73–0.93 | Yes | Factor analysis and confirmatory factor analysis | LaRose & Eastin | 2004 | Journal of Broadcasting & Electronic Media | Not found |
| Internet gratification factors | Seven factors<br>1. Virtual community<br>2. Information seeking<br>3. Aesthetic experience<br>4. Monetary compensation<br>5. Diversion<br>6. Personal status<br>7. Relationship maintenance | 36 | SD | 0.63–0.92 | No | Factor analysis | Song *et al.* | 2004 | Cyber Psychology and Behavior | Not found |

*SD = semantic differential scale, LIK = Likert scale

instruments. Six of the scales reported alpha coefficients as evidence of the scale's reliability and three did not (Eighmey 1997; Eighmey & McCord 1998; Flanagin & Metzger 2001). One conducted a validation check with confirmatory factor analysis (LaRose & Eastin 2004) and one, that we could find, had been replicated (Rodgers & Sheldon 2002). Three of the nine scales had been applied to internet advertising, including the WMI.

A total of 59 internet motive factors are identified by the nine scales. Three primary factors emerged across the scales, including information, entertainment and socialisation. Information acquisition was identified by all nine scales with the following factors: informational value (Eighmey 1997), information involvement (Eighmey & McCord 1998), information (Korgaonkar & Wolin 1999), information seeking (Papacharissi & Rubin 2000), information (Flanagin & Metzger 2001), cognitive (Stafford & Stafford 2001), research (Rodgers & Sheldon 2002), novel outcomes (LaRose & Eastin 2004) and information seeking (Song *et al.* 2004).

The second internet motive that emerged across all nine scales is socialisation, which broadly refers to the communication, interactivity and/or relationship-building function of the internet. Factors include: interactivity (Eighmey 1997), interest in continuing communication (Eighmey & McCord 1998), socialisation (Korgaonkar & Wolin 1999), interpersonal utility (Papacharissi & Rubin 2000), social bonding and relationship building (Flanagin & Metzger 2001), social (Stafford & Stafford 2001), communicate (Rodgers & Sheldon 2002), social outcomes (LaRose & Eastin 2004) and virtual community (Song *et al.* 2004).

The third internet motive, namely entertainment, is captured by eight of the nine scales and is represented by the following factors: entertainment value (Eighmey 1997), entertainment value (Eighmey & McCord 1998), entertainment (Papacharissi & Rubin 2000), play (Flanagin & Metzger 2001), entertainment (Stafford & Stafford 2001), surf (Rodgers & Sheldon 2002), activity outcomes (LaRose & Eastin 2004) and aesthetic experience (Song *et al.* 2004).

Shopping also emerged as a factor in five out of the nine scales, as represented by the following factors: purchase interest (Eighmey & McCord 1998), economic and transaction-based security/privacy concerns (Korgaonkar & Wolin 1999), shop (Rodgers & Sheldon 2002), monetary outcomes (LaRose & Eastin 2004) and monetary compensation (Song *et al.* 2004).

From this review, it appears that there are advantages and disadvantages of the WMI in its current state. The WMI has been tested and retested on a number of student, non-student, US and non-US samples, which increases its ability to generalise to different populations (Peter 1979). In comparison to existing measures, the validity and reliability of the WMI has been assessed at different points in time and across different samples, providing additional evidence of the scale's construct validity and reliability. The WMI has been applied to internet advertising, suggesting its potential use in this area. The four predominant motives that emerged from our review – information, socialisation, entertainment and shopping – were present in four out of the nine scales including the WMI, suggesting that the scale captures perhaps the most predominant internet motives. However, the identification of internet motives beyond these four, such as pass time (Papacharissi & Rubin 2000), persuasion (Flanagin & Metzger 2001) and diversion (Song *et al.* 2004), suggest that additional internet motives may exist that are not captured by the WMI. The usefulness of any scale is dependent on the robustness of its psychometric properties (Churchill 1979). Given the somewhat limited assessment of the scale's robustness and the inconsistencies produced by the scale, a reassessment of the WMI seems appropriate.

## Overview

The research reported in the remainder of this paper describes a replication of the WMI and the development and validation of the extended WMI. First, we describe Study 1, which replicates the WMI on three different student samples of internet users in the US, UK and Australia. We provide evidence from Study 1 that the original four-factor structure of the WMI is reliable across samples. Then, we describe the procedures used to replicate and validate the WMI with confirmatory factor analysis (CFA) using three different student samples from the US, UK and Australia in Study 2. We provide evidence of the scale's unidimensionality in measuring the construct, namely internet motives. We then describe the procedures used to generate and purify 'new' uses of the internet. An exploratory factor analysis is undertaken to examine the original WMI and new motives collected in Study 2. Subsequent CFAs are conducted to examine the extended version of the WMI for each sample. We report

further evidence from a series of analyses in Study 2 of the WMI's discriminant, convergent and nomological validity.

## Method

### *Study 1*

*Participants*

A pen-and-paper survey of the 12 items comprising the WMI was administered to undergraduate students at three universities: US ($N$ = 185, male = 40% and female = 60%), UK ($N$ = 337, male = 49% and female = 52%), and Australia ($N$ = 129, male = 31% and female = 69%). Students received extra credit for their participation.

Students are an appropriate sample since they are heavy users of the internet and are adequate when research addresses methodological issues such as scale development and validation (Chen *et al.* 2002).

*Survey items*

Survey items included the 12 items comprising the WMI, rated on five-point Likert scales ranging from (1) strongly disagree to (5) strongly agree. The stem, 'I use the internet to:' was followed by the items: 'email other people', 'connect with my friends', 'make a purchase', 'do research', 'explore new sites', 'buy things', 'communicate with others', 'get information I need', 'surf for fun', 'find interesting web pages', 'purchase a product I've heard about' and 'find out things I need to know'. Participants were also asked to list any additional uses of the internet, to be examined later on in Study 2.

*Results*

Factor analysis followed by Varimax rotation was used to reduce the dimensionality of the WMI (Bollen & Lennox 1991). Items with eigenvalues of 1.0 or higher and item loadings of 0.40 were retained (Nunnally & Bernstein 1993). The same four-factor structure resulted for the three samples (see Table 2). For the US sample, the resulting motives and their alphas were: research ($\alpha$ = 0.81), communicate ($\alpha$ = 0.78), shop ($\alpha$ = 0.93) and surf ($\alpha$ = 0.90), which explained 79% of the total item variance. For the UK sample, the resulting motives and their alphas were: research

**Table 2: Rotated factor pattern from principal component analysis of the WMI (Study 1)**

| Motives | Shop | Surf | Research | Communicate | Items |
|---|---|---|---|---|---|
| **US SAMPLE** | | | | | |
| *I use the internet to:* | | | | | |
| **Shop** | 0.94 | | | | 1. Make a purchase |
| | 0.93 | | | | 2. Buy things |
| | 0.93 | | | | 3. Purchase a product I've heard about |
| **Surf** | | 0.83 | | | 4. Explore new sites |
| | | 0.88 | | | 5. Surf for fun |
| | | 0.92 | | | 6. Find interesting web pages |
| **Research** | | | 0.85 | | 7. Do research |
| | | | 0.83 | | 8. Get information I need |
| | | | 0.80 | | 9. Find out things I need to know |
| **Communicate** | | | | 0.80 | 10. Email other people |
| | | | | 0.80 | 11. Connect with my friends |
| | | | | 0.90 | 12. Communicate with others |
| **UK SAMPLE** | | | | | |
| *I use the internet to:* | | | | | |
| **Shop** | 0.95 | | | | 1. Make a purchase |
| | 0.96 | | | | 2. Buy things |
| | 0.92 | | | | 3. Purchase a product I've heard about |
| **Surf** | | 0.73 | | | 4. Explore new sites |
| | | 0.85 | | | 5. Surf for fun |
| | | 0.86 | | | 6. Find interesting web pages |
| **Research** | | | 0.82 | | 7. Do research |
| | | | 0.82 | | 8. Get information I need |
| | | | 0.81 | | 9. Find out things I need to know |
| **Communicate** | | | | 0.82 | 10. Email other people |
| | | | | 0.85 | 11. Connect with my friends |
| | | | | 0.76 | 12. Communicate with others |
| **AUSTRALIAN SAMPLE** | | | | | |
| *I use the internet to:* | | | | | |
| **Shop** | 0.94 | | | | 1. Make a purchase |
| | 0.95 | | | | 2. Buy things |
| | 0.86 | | | | 3. Purchase a product I've heard about |
| **Surf** | | 0.66 | | | 4. Explore new sites |
| | | 0.91 | | | 5. Surf for fun |
| | | 0.91 | | | 6. Find interesting web pages |
| **Research** | | | 0.74 | | 7. Do research |
| | | | 0.83 | | 8. Get information I need |
| | | | 0.80 | | 9. Find out things I need to know |
| **Communicate** | | | | 0.74 | 10. Email other people |
| | | | | 0.87 | 11. Connect with my friends |
| | | | | 0.79 | 12. Communicate with others |

($\alpha$ = 0.79), communicate ($\alpha$ = 0.75), shop ($\alpha$ = 0.95) and surf ($\alpha$ = 0.80), which explained 75% of the total item variance. For the Australian sample, the resulting internet motives and their alphas were: research ($\alpha$ = 0.74), communicate ($\alpha$ = 0.78), shop ($\alpha$ = 0.90) and surf ($\alpha$ = 0.84). The combined items explained 75% of the total item variance. The high-reliability alpha for each motive across the three countries demonstrates good internal consistency of the WMI scale.

## *Study 2*

*Participants*

The participants in Study 2 were students at the same three universities examined in Study 1, including the US ($N$ = 117; females: 79%, males: 21%), UK ($N$ = 136; females: 45%, males: 55%) and Australia ($N$ = 111; females: 67%, males: 33%). Students received extra credit for their participation.

*Survey items*

Survey items included the original WMI plus an additional 42 items collected from qualitative data in Study 1 and identified in the academic and trade literature. As with Study 1, the items were measured on five-point Likert scales ranging from (1) strongly disagree to (5) strongly agree. The stem, 'I use the internet to:' was followed by the new items listed in the appendix.

*Analysis and results*

With the goal of replicating and extending the WMI, three sets of analyses were performed. First, a confirmatory factor analysis was conducted to assess the validity and reliability of the WMI instrument (the original 12 items) for the three countries. Second, a multi-group analysis of factorial invariance was conducted to assess the measurement equivalence of the WMI instrument within the three samples. Last, the relationship between the extended WMI and internet advertising variables was examined to establish the criterion-related validity and to further investigate the scale's application to internet advertising.

### *CFA analysis of original WMI instrument*

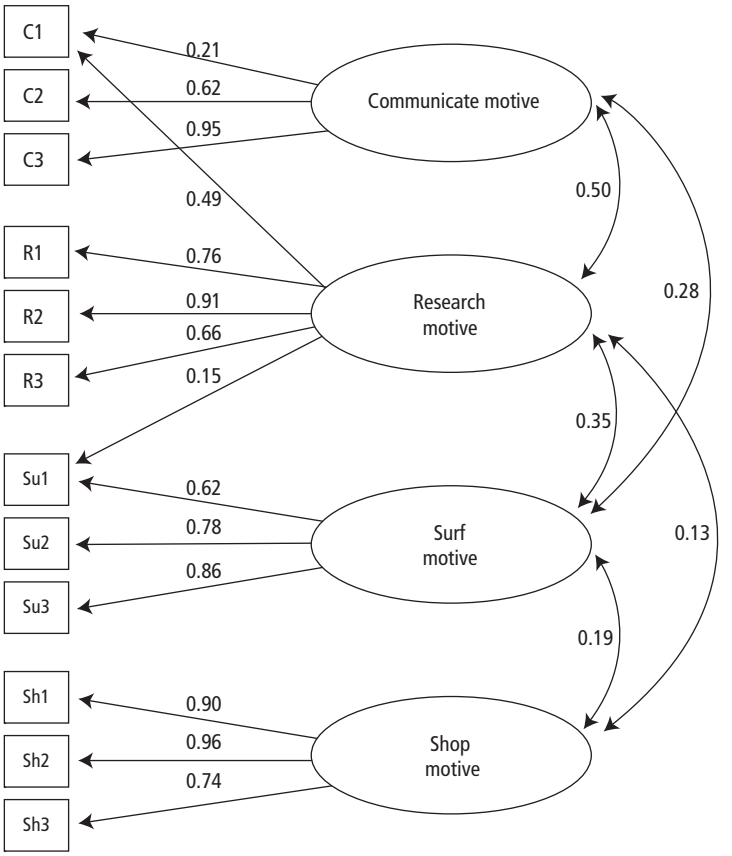
A confirmatory factor analysis (CFA) was conducted to assess the validity and reliability of the WMI. CFA is a more rigorous test of equality than exploratory factor analysis (Alwin & Jackson 1981). First, the WMI structure was validated using overall responses from the three samples. Then, the WMI was validated with a multi-group analysis of factorial invariance, which rigorously assesses cross-national equivalence of measures (Calantone & Zhao 2001). A CFA using AMOS assessed the WMI factorial structures, convergent validity, discriminant validity and the internal consistency of the scale. Measurement items were force-loaded on the original four-factor WMI. The overall goodness of fit was evaluated according to the similarity of the predicted and actual correlation (Gerbing & Anderson 1988). Results show that the model fit indices are a good fit between the model and data ($\chi^2 = 51.892$ $df = 41$; $p = 0.119$; GFI = 0.978, AGFI = 0.958, NFI = 0.977, TLI = 0.992, RMSEA = 0.027) (see Figure 1). Table 3 documents the detailed estimates from the CFA analysis.

**Table 3: CFA results – Study 2 (three samples combined)**

| Items | Labels | | Constructs | Estimate | Standardised estimate | SE | CR | *p* |
|---|---|---|---|---|---|---|---|---|
| C1 | Email other people | ← | Communicate motive | 1.000* | 0.209 | – | – | – |
| C2 | Connect with my friends | ← | Communicate motive | 4.092 | 0.617 | 0.979 | 4.182 | *** |
| C3 | Communicate with others | ← | Communicate motive | 5.608 | 0.951 | 1.550 | 3.619 | *** |
| C1 | Email other people | ← | Research motive | 0.623 | 0.487 | 0.068 | 9.195 | *** |
| R1 | Do research | ← | Research motive | 1.000* | 0.756 | – | – | – |
| R2 | Get information I need | ← | Research motive | 1.149 | 0.909 | 0.075 | 15.296 | *** |
| R3 | Find out things I need to know | ← | Research motive | 0.871 | 0.660 | 0.068 | 12.730 | *** |
| Su1 | Explore new sites | ← | Research motive | 0.264 | 0.145 | 0.086 | 3.056 | 0.002 |
| Su1 | Explore new sites | ← | Surf motive | 1.000* | 0.616 | – | – | – |
| Su2 | Surf for fun | ← | Surf motive | 1.248 | 0.783 | 0.113 | 11.068 | *** |
| Su3 | Find interesting web pages | ← | Surf motive | 1.475 | 0.859 | 0.133 | 11.079 | *** |
| Sh1 | Make a purchase | ← | Shop motive | 1.000* | 0.904 | – | – | – |
| Sh2 | Buy things | ← | Shop motive | 1.092 | 0.959 | 0.041 | 26.385 | *** |
| Sh3 | Purchase a product I've heard about | ← | Shop motive | 0.796 | 0.741 | 0.043 | 18.607 | *** |

* We constrained the parameter to fix the scale of the latent construct; *** $p < 0.001$

**Figure 1: CFA for original WMI – Study 2 (three samples)**




## *Convergent and discriminant validity*

Convergent validity was assessed with structural equation modelling by determining whether indicator variables loaded significantly on the specified construct (Gerbing & Anderson 1988). The significance of the associated *t*-value for the respective value of lambda was assessed (Byrne 1989). This information is presented in Table 3 along with each indicator's loading coefficient. Results show that each variable yielded a highly significant estimate, which demonstrates high convergent validity (Gerbing & Anderson 1988).

An accepted test of discriminant validity is to constrain the estimated correlation parameter between pairs of constructs to 1.0 and conduct a chi-squared difference test on the values obtained from the models containing the constrained pairs and the unconstrained model in which the correlation parameter varies freely (Joreskog 1971). The results yielded a significantly lower $\chi^2$ value on the unconstrained model (as compared to the constrained model), which provides evidence that the comparison dimensions are not perfectly correlated (i.e. the motives are distinct) – an indication that discriminant validity is achieved (Bagozzi & Phillips 1982).

### *Calibration of original WMI instrument*

The overall CFA findings confirm the original WMI factorial structure and indicate two changes in the original scale. The first change was the communication factor. The original WMI item 'email other people' shifted from the communication motive in Study 1 to the research motive in Study 2. This shift was evidenced by a higher loading for research (0.49) vs communication (0.21). The second change in the original WMI pertained to the item 'explore new sites'. This item loaded exclusively on the surf motive in Study 1 but loaded on both the research motive (0.15) and the surf motive (0.62) in Study 2.

### *Nomological validity*

Nomological validity assesses whether the construct of interest behaves as it should (Bagozzi 1980; Cronbach & Meehl 1955) with regard to its external relationships with other constructs (Reise *et al.* 1993). To confirm the nomological validity of the WMI, we investigated the relationship between the four motives and two criterion variables, specific to internet advertising. The first captured approach behaviour, measured by the item 'I tend to click on internet ads' and the second measured avoidance behaviour with the item 'I typically try to avoid internet ads' (Table 4).

Table 5 provides the bivariate correlations between each WMI motive and criterion variable. The findings show that the surf ($r = 0.209$, $p < 0.01$) and shop motive ($r = 0.139$, $p < 0.01$) significantly correlated with approach behaviour, whereas the communication ($r = 0.104$, $p < 0.05$), research ($r =$

**Table 4: Correlation matrix between WMI and criterion variables (Study 2)**

| Motive | I tend to click on internet ads | I typically try to avoid internet ads |
|---|---|---|
| Communication | 0.046 | 0.104* |
| Research | –0.067 | 0.132* |
| Surf | 0.209** | 0.077 |
| Shop | 0.139** | 0.108* |

** Correlation is significant at the 0.01 level (two-tailed)
* Correlation is significant at the 0.05 level (two-tailed)

**Table 5: Regression analysis (Study 2)**

| Dependent variables | | | | |
|---|---|---|---|---|
| **Predictors** | **I tend to click on internet ads** | | **I typically try to avoid internet ads** | |
| **WMI:** | **β** | ***P*** | **β** | ***P*** |
| Communication motive | 0.09 | 0.250 | 0.08 | 0.508 |
| Research motive | –0.30 | 0.001 | 0.22 | 0.138 |
| Surf motive | 0.25 | 0.000 | 0.03 | 0.776 |
| Shop motive | 0.10 | 0.022 | 0.12 | 0.105 |
| $R^2$ (Adj. $R^2$) | 0.084** | (0.074**) | 0.027* | (0.016*) |

** Correlation is significant at the 0.01 level (two-tailed)
* Correlation is significant at the 0.05 level (two-tailed)

0.132, $p < 0.05$) and shop motives ($r = 0.108$, $p < 0.05$) were associated with avoidance behaviour pertaining to internet ads.

To further explore the predictive power of the WMI, we regressed each of the two criterion variables on the four motives (see Table 6). The results show that the four-factor model predicted approach behaviour ($R^2 = 0.084$; adjusted $R^2 = 0.074$; $p < 0.01$); the research ($\beta = –0.30$, $p = 0.001$), surf ($\beta = 0.25$, $p = 0.000$) and shop motives ($\beta = 0.10$, $p = 0.022$) were significant predictors of approach behaviour. The research motive decreased, and the surf and shop motives increased, consumers' intention to click on internet ads. None of the four WMI motives significantly predicted avoidance behaviour, although the overall model's predictive power was acceptable ($R^2 = 0.027$; adjusted $R^2 = 0.016$; $p < 0.05$).

### *Multi-group analysis of factorial invariance*

To assess the cross-national equivalence of WMI measures, CFA in the multi-group level was performed. An unconstrained CFA was conducted that allowed the factor structure to vary across samples in the US, UK and Australia. After a slight modification, the results revealed a high level of consistency in model form and measurement across the three groups. Factor loadings for each indicator for its respective construct were significant ($p < 0.01$) except for the items: 'connect with my friends' and 'communicate with others' for the US and Australian samples; 'explore new sites' for the UK sample; and 'connect with my friends' for the UK and Australian samples. Factor loadings yielded similar patterns for the three samples, shown in Tables 6–8, and the multi-group model yielded a good fit ($\chi^2 = 118.272$, $df = 102$; $p = 0.129$; GFI = 0.954, AGFI = 0.894, NFI = 0.952, TLI = 0.986, RMSEA = 0.021) (see Figure 2). Invariance testing (i.e. test of equivalence) is a particularly demanding test of an instrument's robustness that helps diagnose measurement equivalence; minor changes in item loadings may not be critical to the interpretation of research results

**Table 6: CFA results – Study 2 (United States)**

| Items | Labels | | Constructs | Estimate | Standardised estimate | SE | CR | *p* |
|---|---|---|---|---|---|---|---|---|
| C1 | Email other people | ← | Communicate motive | 1.000* | 0.124 | – | – | – |
| C2 | Connect with my friends | ← | Communicate motive | 8.327 | 0.531 | 4.593 | 1.813 | 0.070 |
| C3 | Communicate with others | ← | Communicate motive | 14.748 | 1.089 | 9.428 | 1.564 | 0.118 |
| C1 | Email other people | ← | Research motive | 1.000* | 0.787 | – | – | – |
| R1 | Do research | ← | Research motive | 1.222 | 0.918 | 0.119 | 10.275 | *** |
| R2 | Get information I need | ← | Research motive | 1.040 | 0.744 | 0.121 | 8.624 | *** |
| R3 | Find out things I need to know | ← | Research motive | 0.688 | 0.648 | 0.095 | 7.211 | *** |
| Su1 | Explore new sites | ← | Research motive | 0.361 | 0.155 | 0.168 | 2.149 | 0.032 |
| Su1 | Explore new sites | ← | Surf motive | 1.000* | 0.710 | – | – | – |
| Su2 | Surf for fun | ← | Surf motive | 1.137 | 0.851 | 0.131 | 8.665 | *** |
| Su3 | Find interesting web pages | ← | Surf motive | 1.296 | 0.910 | 0.146 | 8.858 | *** |
| Sh1 | Make a purchase | ← | Shop motive | 1.000* | 0.934 | – | – | – |
| Sh2 | Buy things | ← | Shop motive | 1.072 | 0.966 | 0.057 | 18.899 | *** |
| Sh3 | Purchase a product I've heard about | ← | Shop motive | 0.897 | 0.785 | 0.074 | 12.141 | *** |
| C2 | Connect with my friends | ← | Shop motive | 0.313 | 0.327 | 0.076 | 4.123 | *** |

* We constrained the parameter to fix the scale of the latent construct
*** p <0 .001

**Table 7: CFA results – Study 2 (United Kingdom)**

| Items | Labels | | Constructs | Estimate | Standardised estimate | SE | CR | *p* |
|---|---|---|---|---|---|---|---|---|
| C1 | Email other people | ← | Communicate motive | 1.000* | 0.346 | – | – | – |
| C2 | Connect with my friends | ← | Communicate motive | 2.457 | 0.683 | 0.654 | 3.756 | *** |
| C3 | Communicate with others | ← | Communicate motive | 2.455 | 0.794 | 0.867 | 2.832 | 0.005 |
| C1 | Email other people | ← | Research motive | 1.000* | 0.716 | – | – | – |
| R1 | Do research | ← | Research motive | 1.120 | 0.920 | 0.134 | 8.370 | *** |
| R2 | Get information I need | ← | Research motive | 0.776 | 0.595 | 0.108 | 7.158 | *** |
| R3 | Find out things I need to know | ← | Research motive | 0.603 | 0.437 | 0.113 | 5.340 | *** |
| Su1 | Explore new sites | ← | Research motive | 0.203 | 0.120 | 0.124 | 1.644 | 0.100 |
| Su1 | Explore new sites | ← | Surf motive | 1.000* | 0.638 | – | – | – |
| Su2 | Surf for fun | ← | Surf motive | 1.166 | 0.762 | 0.168 | 6.956 | *** |
| Su3 | Find interesting web pages | ← | Surf motive | 1.332 | 0.824 | 0.184 | 7.223 | *** |
| Sh1 | Make a purchase | ← | Shop motive | 1.000* | 0.913 | – | – | – |
| Sh2 | Buy things | ← | Shop motive | 1.033 | 0.943 | 0.071 | 14.453 | *** |
| Sh3 | Purchase a product I've heard about | ← | Shop motive | 0.662 | 0.633 | 0.071 | 9.313 | *** |
| C2 | Connect with my friends | ← | Shop motive | –0.055 | –0.053 | 0.090 | -0.614 | 0.539 |

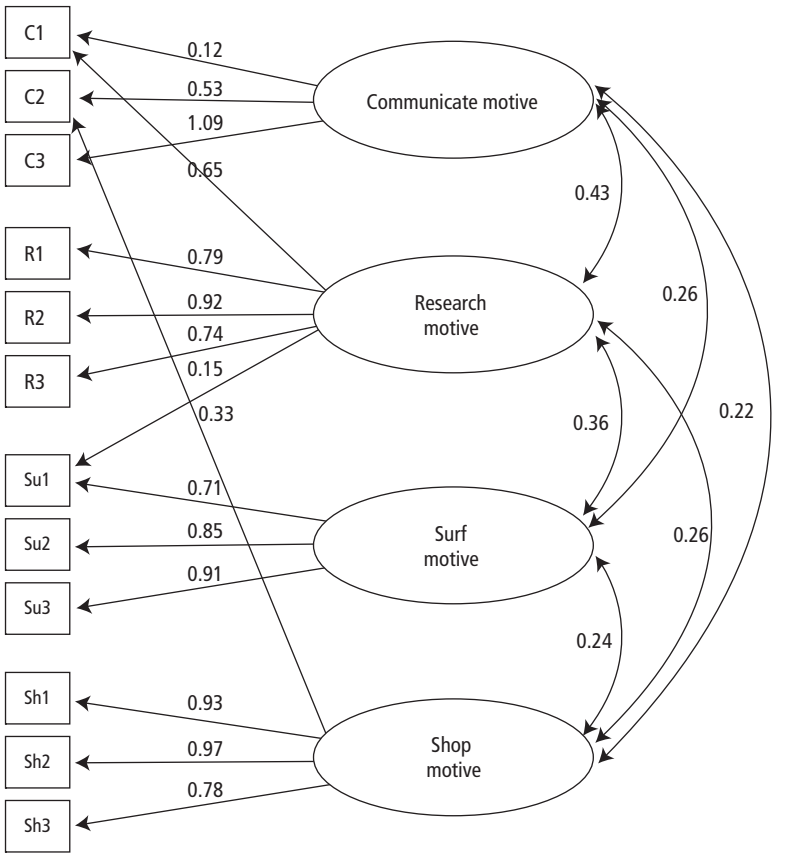
* We constrained the parameter to fix the scale of the latent construct
*** $p < 0.001$

**Table 8: CFA results – Study 2 (Australia)**

| Items | Labels | | Constructs | Estimate | Standardised estimate | SE | CR | *p* |
|---|---|---|---|---|---|---|---|---|
| C1 | Email other people | ← | Communicate motive | 1.000* | 0.140 | – | – | – |
| C2 | Connect with my friends | ← | Communicate motive | 5.252 | 0.563 | 3.293 | 1.595 | 0.111 |
| C3 | Communicate with others | ← | Communicate motive | 9.673 | 1.048 | 6.461 | 1.497 | 0.134 |
| C1 | Email other people | ← | Research motive | 1.000* | 0.784 | – | – | – |
| R1 | Do research | ← | Research motive | 1.186 | 0.901 | 0.123 | 9.668 | *** |
| R2 | Get information I need | ← | Research motive | 0.864 | 0.666 | 0.119 | 7.261 | *** |
| R3 | Find out things I need to know | ← | Research motive | 0.575 | 0.459 | 0.129 | 4.466 | *** |
| Su1 | Explore new sites | ← | Research motive | 0.336 | 0.195 | 0.170 | 1.983 | 0.047 |
| Su1 | Explore new sites | ← | Surf motive | 1.000* | 0.456 | – | – | – |
| Su2 | Surf for fun | ← | Surf motive | 1.650 | 0.723 | 0.376 | 4.385 | *** |
| Su3 | Find interesting web pages | ← | Surf motive | 2.206 | 0.898 | 0.527 | 4.184 | *** |
| Sh1 | Make a purchase | ← | Shop motive | 1.000* | 0.845 | – | – | – |
| Sh2 | Buy things | ← | Shop motive | 1.115 | 0.916 | 0.099 | 11.235 | *** |
| Sh3 | Purchase a product I've heard about | ← | Shop motive | 0.879 | 0.747 | 0.095 | 9.229 | *** |
| C2 | Connect with my friends | ← | Shop motive | –0.003 | –0.003 | 0.079 | –0.036 | 0.971 |

* We constrained the parameter to fix the scale of the latent construct
*** $p < 0.001$

**Figure 2: CFA for original WMI – Study 2 (multi-group comparison: US sample shown in CFA factorial structure)**




(Byrne & Shavelson 1987). Thus, despite minor differences in item-factor loadings, it was concluded that the three samples have virtually the same pattern of variables associated with the four latent motive constructs (McGowan & Sternquist 1998).

To further test the equivalence of the measurement model across the three samples, a constrained CFA was conducted. If the measurement properties are the same for the three samples, factor patterns and factor loadings should be equal. Therefore, we set the factor structure to be invariant in the constrained model. The results indicated identical factor

patterns. Compared with the unconstrained model, the difference in $\chi^2$ value of 36.72 with *df* of 22 suggests that factor structure was indifferent across samples. The constrained model also exhibited a good fit ($\chi^2$ = 155.024, *df* = 124; *p* = 0.031; GFI = 0.940, AGFI = 0.886, NFI = 0.937, TLI = 0.978, RMSEA = 0.026).

## *Extension of web motivation inventory*

*Data analysis*

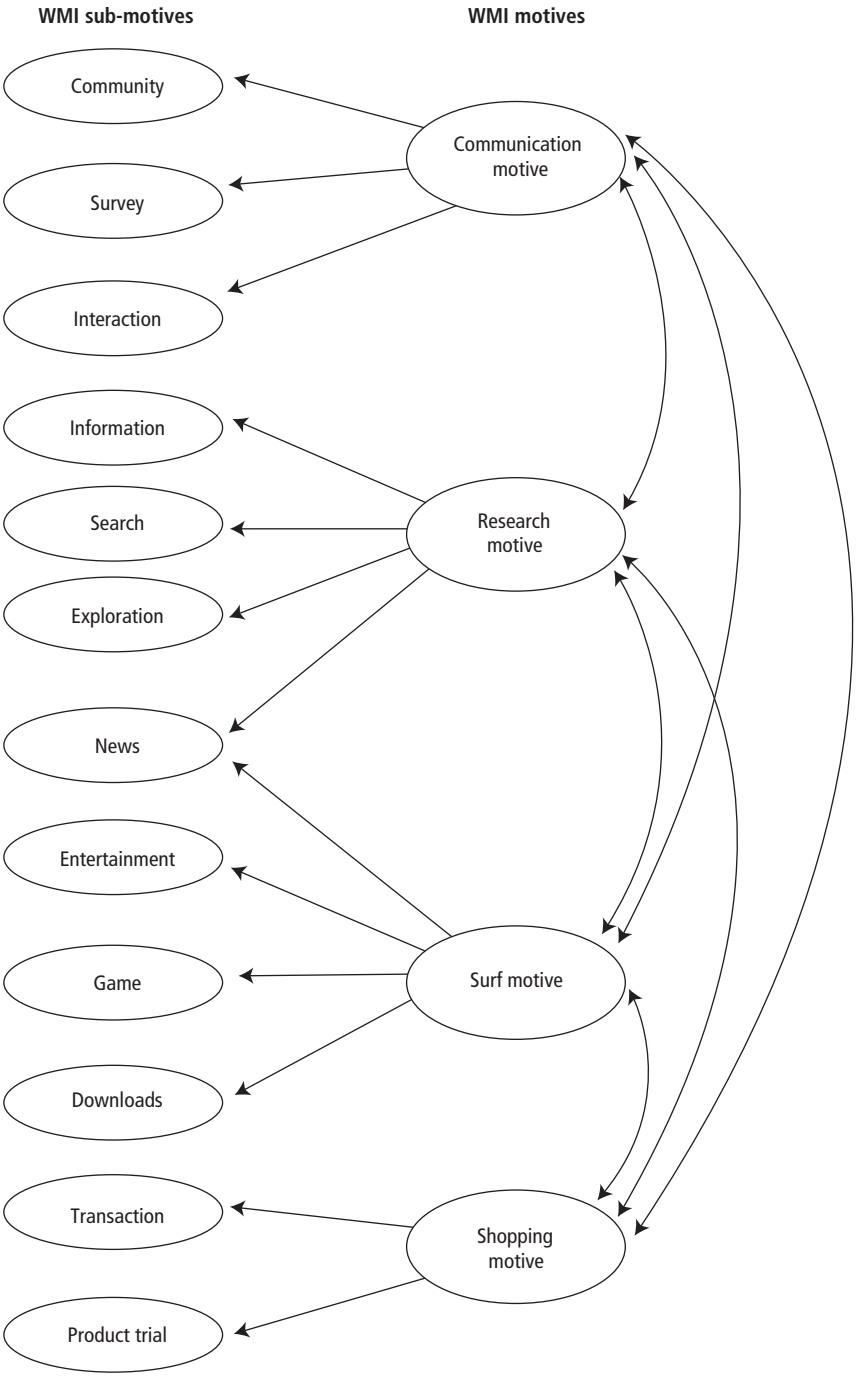
To examine the validity and reliability of the extended version of the WMI, exploratory factor analysis with the original 12 items and 42 new items was used to explore the emergence of possible new internet motive factors. An eigenvalue of 1.00 was used as the stopping criterion rather than force a specified factor solution. Principal component analysis with Varimax rotation yielded 12 factors, explaining 67% of the matrix variance (see Table 9). The new factors were labelled: Community, Entertainment, Product trial, Information, Transaction, Game, Survey, Downloads, Interaction, Search, Exploration and News. The highest three loadings above 0.40 were used to represent each factor, as shown in Table 9. The 12 factors were mapped conceptually to form the sub-factors of the original WMI scale where: Community, Survey and Interaction are sub-motives of the original Communication motive; Information, Search and Exploration are sub-motives of the original Research motive; Entertainment, Game and Downloads are sub-motives of the original Surf motive; and Transaction and Product trial are sub-motives of the original Shopping motive. News emerged as a sub-motive for both of the original Research and Surf motives (see Figure 3).

A confirmatory factor analysis (CFA) was then conducted to assess whether the conceptual structure of the WMI fit the data. Table 10 shows that although the $\chi^2$ statistic ($\chi^2$ = 1051.272, *df* = 500, $p < 0.0001$) did not indicate a perfect fit, it is not always the best indication of model fit (e.g. Bagozzi & Yi 1988; Mulaik *et al.* 1989); therefore a range of additional fit indices is reported. The additional indices taken together (GFI = 0.859, AGFI = 0.833, NFI = 0.851, TLI = 0.905, CFI = 0.915, RMSEA = 0.054) indicate a reasonably good fit between the data and extended version of the WMI.

**Table 9: Exploratory factor analysis with original WMI and new motives (Study 2)**

| Sub-motives | Items | Loading | Variance explained |
|---|---|---|---|
| 1. Community | Get to know other people | 0.767 | 11.30 |
| | Participate in an online chat | 0.754 | |
| | Join a group | 0.733 | |
| 2. Entertainment | Amuse myself | 0.761 | 8.07 |
| | Entertain myself | 0.758 | |
| | Find information to entertain myself | 0.714 | |
| 3. Product trial | Try on the latest fashions | 0.716 | 7.83 |
| | Experience a product | 0.659 | |
| | Try out a product | 0.652 | |
| 4. Information | Do research | 0.827 | 7.00 |
| | Get information I need | 0.804 | |
| | Search for information I need | 0.693 | |
| 5. Transaction | Make a purchase | 0.907 | 5.89 |
| | Buy things | 0.901 | |
| | Purchase a product I've heard about | 0.828 | |
| 6. Game | Play online games | 0.874 | 5.14 |
| | Entertain myself with internet games | 0.858 | |
| | Play online games with individuals from other countries | 0.706 | |
| 7. Survey | Take a survey on a topic I care about | 0.799 | 4.93 |
| | Fill out an online survey | 0.771 | |
| | Give my opinion on a survey | 0.674 | |
| 8. Downloads | Download music | 0.694 | 3.91 |
| | Listen to music | 0.532 | |
| | Watch online videos | 0.450 | |
| 9. Interaction | Connect with my friends | 0.784 | 3.75 |
| | Communicate with others | 0.712 | |
| | Instant message others I know | 0.511 | |
| 10. Search | Get answers to specific questions | 0.727 | 3.48 |
| | Find information I can trust | 0.536 | |
| 11. Exploration | Find interesting web pages | 0.703 | 3.42 |
| | Explore new sites | 0.635 | |
| | Surf for fun | 0.578 | |
| 12. News | Read about current events and news | 0.595 | 2.71 |
| | Read entertainment news | 0.580 | |

**Figure 3: Extended WMI conceptual model – Study 2**



## Table 10: CFA results for extended WMI (Study 2)

| Labels | | Constructs | Estimate | Standardised estimate | SE | CR | *p* |
|---|---|---|---|---|---|---|---|
| ***Sub-motives:*** | | | | | | | |
| Community | ← | Communication motive | 1.000* | 0.931 | – | – | – |
| Survey | ← | Communication motive | 0.482 | 0.517 | 0.075 | 6.463 | *** |
| Interaction | ← | Communication motive | 0.266 | 0.293 | 0.061 | 4.381 | *** |
| Exploration | ← | Communication motive | 0.026 | 0.025 | 0.110 | 0.236 | 0.813 |
| Product trial | ← | Communication motive | 0.482 | 0.576 | 0.124 | 3.889 | *** |
| Information | ← | Research motive | 1.000* | 0.824 | – | – | – |
| Search | ← | Research motive | 0.634 | 0.528 | 0.128 | 4.944 | *** |
| Exploration | ← | Research motive | 0.767 | 0.418 | 0.148 | 5.198 | *** |
| News | ← | Research motive | 0.690 | 0.539 | 0.119 | 5.813 | *** |
| Interaction | ← | Research motive | 0.897 | 0.558 | 0.132 | 6.775 | *** |
| Entertainment | ← | Research motive | 0.841 | 0.434 | 0.141 | 5.977 | *** |
| Entertainment | ← | Surf motive | 1.000* | 0.604 | – | – | – |
| Game | ← | Surf motive | 1.114 | 0.605 | 0.145 | 7.684 | *** |
| Downloads | ← | Surf motive | 1.279 | 0.747 | 0.164 | 7.810 | *** |
| News | ← | Surf motive | 0.554 | 0.506 | 0.086 | 6.470 | *** |
| Exploration | ← | Surf motive | 0.766 | 0.487 | 0.190 | 4.041 | *** |
| Product trial | ← | Surf motive | 0.015 | 0.012 | 0.143 | 0.108 | 0.914 |
| Transaction | ← | Shopping motive | 1.000* | 0.406 | – | – | – |
| Product trial | ← | Shopping motive | 1.066 | 0.639 | 0.247 | 4.318 | *** |
| Survey | ← | Shopping motive | 0.976 | 0.525 | 0.219 | 4.458 | *** |
| Search | ← | Shopping motive | 0.674 | 0.497 | 0.180 | 3.741 | *** |
| ***Items:*** | | | | | | | |
| Play online games | ← | Game | 1.000* | 0.889 | – | – | – |
| Entertain myself with internet games | ← | Game | 1.042 | 0.932 | 0.044 | 23.600 | *** |
| Play online games with individuals from other countries | ← | Game | 0.747 | 0.729 | 0.044 | 17.071 | *** |
| Download music | ← | Downloads | 1.000* | 0.747 | – | – | – |
| Listen to music | ← | Downloads | 0.891 | 0.675 | 0.081 | 10.953 | *** |
| Watch online videos | ← | Downloads | 0.873 | 0.708 | 0.077 | 11.356 | *** |
| Try on the latest fashions | ← | Product trial | 1.000* | 0.635 | – | – | – |
| Experience a product | ← | Product trial | 1.269 | 0.847 | 0.106 | 11.985 | *** |
| Try out a product | ← | Product trial | 1.045 | 0.746 | 0.092 | 11.372 | *** |
| Get to know other people | ← | Community | 1.000* | 0.809 | – | – | – |
| Participate in an online chat | ← | Community | 0.943 | 0.746 | 0.067 | 14.160 | *** |
| Join a group | ← | Community | 0.822 | 0.768 | 0.057 | 14.537 | *** |
| Take a survey on a topic I care about | ← | Survey | 1.000* | 0.762 | – | – | – |
| Fill out an online survey | ← | Survey | 1.122 | 0.814 | 0.074 | 15.116 | *** |
| Give my opinion on a survey | ← | Survey | 1.069 | 0.834 | 0.070 | 15.355 | *** |
| Connect with my friends | ← | Interaction | 1.000* | 0.778 | – | – | – |
| Communicate with others | ← | Interaction | 0.845 | 0.741 | 0.077 | 10.961 | *** |
| Instant message others I know | ← | Interaction | 0.980 | 0.561 | 0.106 | 9.244 | *** |
| Do research | ← | Information | 1.000* | 0.785 | – | – | – |
| Get information I need. | ← | Information | 1.019 | 0.841 | 0.068 | 14.923 | *** |
| Search for information I need | ← | Information | 1.109 | 0.683 | 0.087 | 12.757 | *** |
| Get answers to specific questions | ← | Search | 1.000* | 0.539 | – | – | – |
| Find information I can trust | ← | Search | 1.256 | 0.696 | 0.214 | 5.865 | *** |
| Find information to entertain myself | ← | Entertainment | 1.000* | 0.864 | – | – | – |
| Entertain myself | ← | Entertainment | 0.895 | 0.758 | 0.054 | 16.662 | *** |
| Amuse myself | ← | Entertainment | 0.991 | 0.818 | 0.054 | 18.406 | *** |
| Make a purchase | ← | Transaction | 1.000* | 0.904 | – | – | – |
| Buy things | ← | Transaction | 1.089 | 0.958 | 0.041 | 26.471 | *** |
| Purchase a product I've heard about | ← | Transaction | 0.811 | 0.748 | 0.044 | 18.544 | *** |
| Find interesting web pages | ← | Exploration | 1.000* | 0.817 | – | – | – |
| Surf for fun | ← | Exploration | 0.963 | 0.842 | 0.059 | 16.450 | *** |
| Explore new sites | ← | Exploration | 0.756 | 0.654 | 0.059 | 12.758 | *** |
| Read about current events and news | ← | News | 1.000* | 0.624 | – | – | – |
| Read entertainment news | ← | News | 1.375 | 0.766 | 0.147 | 9.331 | *** |

* We constrained the parameter to fix the scale of the latent construct
*** $p < 0.001$

## Discussion and conclusion

### *Overview*

The purpose of this research was to replicate and extend the original Web Motivation Inventory (WMI), which categorises internet motives into four primary factors: research, communication, surfing and shopping. The scale's psychometric properties were examined with two studies: Study 1 replicated the WMI with samples from the US, UK and Australia, and Study 2 replicated and extended the WMI with three new samples from the same three countries.

The results presented here provide support for the psychometric soundness of the original WMI and the extended WMI. The original WMI was shown to be valid and reliable with US and non-US samples with somewhat different market and consumer settings, suggesting that the WMI is a culturally neutral scale that may be useful in a global environment. The extended WMI yielded 12 new sub-motives that proved to be adequate extensions of the original four-factor scale, providing additional evidence of the scale's unidimensionality, validity and reliability. The original WMI yielded meaningful responses among internet users on the approach and avoidance behavioural items regarding internet advertising, thereby suggesting that the scale possesses useful advertising and managerial applications.

### *Limitations and future research*

There are several limitations and directions for future research. First, although the respondents were from three different countries, the three countries were English-speaking and shared perhaps other cultural characteristics. It may be informative to consider how the three countries differ, and also how cultures within the same country differ in their responses to the WMI. Ideally, countries beyond those examined here could also be included in future studies that examine the WMI.

Second, follow-up studies could consider possibly improving the original and extended versions of the WMI by rewording items that comprise, for example, the communication motive. The items 'communicate with others' and 'connect with my friends' appear to be somewhat confusing to

some respondents. A re-examination of these and other items using different wording would help to further establish the cross-national equivalence of the scale (see Ewing *et al.* 2002).

Third, a limitation of this research is that the samples were undergraduate students. We argued earlier that this is an appropriate sample given the task of validating a scale, particularly across different countries where individuals likely differ with regard to internet needs and motives. A future direction for research is to collect more data from different samples using an improved version of the WMI, and then examine whether the items that shifted from one motive to another in the current research could be applied to other samples. The items that shifted here could be sample and/or country specific (Strasheim *et al.* 2007). More research is needed to determine which items to retain. It may also be advantageous to include more items that have emerged in the trade and academic literature since the writing of this paper and then reassess the stability and psychometric robustness of the WMI instrument. Additionally, it may be useful to consider other forms of new technology that either supplement and/or replace current applications of the internet to account for possible shifts in the items that comprise the WMI, particularly with regard to communication (e.g. Svennevig 2000).

Fourth, internet advertising practitioners and scholars can consider additional external factors with the goal of building a more comprehensive model of how internet motives influence individuals' psychological and behavioural responses to internet ads. In addition to internet ad approach and avoidance behaviour, other variables may include: recall and recognition of internet ads, attitude towards the site, and purchase intentions, to name a few.

Last, the WMI may be applied to scholarly research to better understand and develop theories about how internet users perceive and process advertising stimuli. Future research could consider pairing the WMI with existing internet advertising scales and constructs such as interactivity (McMillan & Hwang 2002), virtuality (Griffith & Chen 2004), and website personality (Chen & Rodgers 2006) to examine applications of the WMI in the field of internet advertising and marketing research.

## Conclusion

If the state of internet marketing and advertising is to develop beyond its current condition, it is useful to assess the scales that have been developed for use in this area. Findings presented here suggest that the original and extended versions of the WMI are valid and reliable scales. Internet advertisers may therefore use the WMI with confidence when gauging consumer motives for internet use.

## Appendix: Web Motivation Inventory with new motives

Please circle the number that best represents your agreement or disagreement

| I use the internet to … | Strongly disagree | | | | Strongly agree |
|---|---|---|---|---|---|
| *Original 12 items*: | | | | | |
| Email other people | 1 | 2 | 3 | 4 | 5 |
| Connect with my friends | 1 | 2 | 3 | 4 | 5 |
| Make a purchase | 1 | 2 | 3 | 4 | 5 |
| Do research | 1 | 2 | 3 | 4 | 5 |
| Explore new sites | 1 | 2 | 3 | 4 | 5 |
| Buy things | 1 | 2 | 3 | 4 | 5 |
| Communicate with others | 1 | 2 | 3 | 4 | 5 |
| Get information I need | 1 | 2 | 3 | 4 | 5 |
| Surf for fun | 1 | 2 | 3 | 4 | 5 |
| Find interesting web pages | 1 | 2 | 3 | 4 | 5 |
| Purchase a product I've heard about | 1 | 2 | 3 | 4 | 5 |
| Find out things I need to know | | | | | |
| *Additional 42 items*: | | | | | |
| Download music | 1 | 2 | 3 | 4 | 5 |
| Watch online videos | 1 | 2 | 3 | 4 | 5 |
| Play online games | 1 | 2 | 3 | 4 | 5 |
| Read entertainment news | 1 | 2 | 3 | 4 | 5 |
| Entertain myself with internet games | 1 | 2 | 3 | 4 | 5 |
| Instant message others I know | 1 | 2 | 3 | 4 | 5 |
| Take a survey on a topic I care about | 1 | 2 | 3 | 4 | 5 |
| Play online games with individuals from other countries | 1 | 2 | 3 | 4 | 5 |
| Search for information I need | 1 | 2 | 3 | 4 | 5 |
| Find information to entertain myself | 1 | 2 | 3 | 4 | 5 |

(continued)

| I use the internet to … | Strongly disagree | | | | Strongly agree |
|---|---|---|---|---|---|
| Amuse myself | 1 | 2 | 3 | 4 | 5 |
| Use a search engine to find the latest trends | 1 | 2 | 3 | 4 | 5 |
| Read about current events and news | 1 | 2 | 3 | 4 | 5 |
| Write a product review | 1 | 2 | 3 | 4 | 5 |
| Give my opinion on a survey | 1 | 2 | 3 | 4 | 5 |
| Create a wish list on a website | 1 | 2 | 3 | 4 | 5 |
| Buy a gift card for a family member or friend | 1 | 2 | 3 | 4 | 5 |
| Talk to a knowledgeable individual | 1 | 2 | 3 | 4 | 5 |
| Listen to other people's problems | 1 | 2 | 3 | 4 | 5 |
| Respond to a posting on a website | 1 | 2 | 3 | 4 | 5 |
| Join a group | 1 | 2 | 3 | 4 | 5 |
| Participate in an online chat | 1 | 2 | 3 | 4 | 5 |
| Try on the latest fashions | 1 | 2 | 3 | 4 | 5 |
| Experience a product | 1 | 2 | 3 | 4 | 5 |
| Download coupons | 1 | 2 | 3 | 4 | 5 |
| Shop for the best price on a product | 1 | 2 | 3 | 4 | 5 |
| Comparison shop | 1 | 2 | 3 | 4 | 5 |
| Get to know other people | 1 | 2 | 3 | 4 | 5 |
| Chat with others | 1 | 2 | 3 | 4 | 5 |
| Find information for someone else | 1 | 2 | 3 | 4 | 5 |
| Find a website someone recommended to me | 1 | 2 | 3 | 4 | 5 |
| Fill out an online survey | 1 | 2 | 3 | 4 | 5 |
| Try out a product | 1 | 2 | 3 | 4 | 5 |
| Entertain myself | 1 | 2 | 3 | 4 | 5 |
| Visit entertaining websites | 1 | 2 | 3 | 4 | 5 |
| Talk to a live person | 1 | 2 | 3 | 4 | 5 |
| Build a relationship with others | 1 | 2 | 3 | 4 | 5 |
| Talk to a person in real time | 1 | 2 | 3 | 4 | 5 |
| Get answers to specific questions | 1 | 2 | 3 | 4 | 5 |
| Find information I can trust | 1 | 2 | 3 | 4 | 5 |
| Cast my vote | 1 | 2 | 3 | 4 | 5 |
| Listen to music | 1 | 2 | 3 | 4 | 5 |

## References

Alwin, D.F. & Jackson, D.J. (1981) Applications of simultaneous factor analysis to issues of factorial invariance, in Jackson, D.D. & Borgotta, E.P. (eds) *Factor Analysis and Measurement in Sociological Research: A Multidimensional Perspective.* Beverly Hills, CA: Sage.

Amiel, T. & Sargent, S.L. (2004) Individual differences in internet usage motives. *Computers in Human Behavior*, **20**(6), pp. 711–726.

Bagozzi, R.P. (1980) *Causal Models in Marketing*. New York: Wiley.
Bagozzi, R.P. & Phillips, L.W. (1982) Representing and testing organizational theories: a holistic construal. *Administrative Science Quarterly*, **27**(3), pp. 459–489.
Bagozzi, R.P. & Yi, Y. (1988) On the evaluation of structural equation models. *Journal of the Academy of Marketing Science*, **16**(1), pp. 74–94.
Berthon, P., Ewing, M., Pitt, L. & Berthon, J.P. (2003) Reframing replicative research in advertising. *International Journal of Advertising*, **22**(9), pp. 511–530.
Bollen, K. & Lennox, R. (1991) Conventional wisdom on measurement: a structural equation perspective. *Psychological Bulletin*, **110**(2), pp. 305–314.
Byrne, B.M. (1989) *A Primer of LISREL*. New York: Springer-Verlag.
Byrne, B.M. & Shavelson, R.J. (1987) Adolescent self-concept: testing the assumption of equivalent structure across gender. *American Educational Research Journal*, **24**(3), pp. 365–385.
Cai, S. & Jun, M. (2003) Internet users' perceptions of online service quality: a comparison of online buyers and information searchers. *Managing Service Quality*, **13**(6), 504–519.
Calantone, R.J. & Zhao, Y.S. (2001) Joint ventures in China: a comparative study of Japanese, Korean, and US partners. *Journal of International Marketing*, **9**(1), pp. 1–23.
Chen, Q., Clifford, S.J. & Wells, W.D. (2002) Attitude toward the site II: new information. *Journal of Advertising Research*, **42**(2), pp. 33–45.
Chen, Q. & Rodgers, S. (2006) Development of an instrument to measure web site personality. *Journal of Interactive Advertising*, **7**(1), online at http://jiad.org/vol7/no1/chen/index.htm.
Churchill, G.A., Jr (1979) A paradigm for developing better measures of marketing constructs. *Journal of Marketing Research*, **16**(1), pp. 64–73.
Cronbach, L.J. & Meehl, P.E. (1955) Construct validity in psychological tests. *Psychological Bulletin*, **52**(4), pp. 281–302.
Deci, E.L. & Ryan, R.M. (1985) The general causality orientations scale: self-determination in personality. *Journal of Research in Personality*, **19**(2), pp. 109–134.
Eighmey, J. (1997) Profiling user responses to commercial web sites. *Journal of Advertising Research*, **37**(3), pp. 59–66.
Eighmey, J. & McCord, L. (1998) Adding value in the information age: uses and gratifications of sites on the World Wide Web. *Journal of Business Research*, **41**(3), pp. 187–194.
Ewing, M.T., Caruana, A. & Zinkhan, G.M. (2002) On the cross-national generalisability and equivalence of advertising response scales developed in the USA. *International Journal of Advertising*, **21**(3), pp. 323–343.
Faber, R.J., Lee, M. & Nan, X. (2004) Advertising and the consumer information environment online. *American Behavioral Scientist*, **48**(4), pp. 447–466.
Flanagin, A.J. & Metzger, M.J. (2001) Internet use in the contemporary media environment. *Human Communication Research*, **27**(1), pp. 153–181.
Francis, J.E. & White, L. (2004) Value across fulfillment-product categories of internet shopping. *Managing Service Quality*, **14**(2/3), pp. 226–234.

Gerbing, D.W. & Anderson, J.C. (1988) An updated paradigm for scale development incorporating unidimensionality and its assessment. *Journal of Marketing Research*, **25**(2), pp. 186–192.

Griffith, D. & Chen, Q. (2004) The influence of virtual direct experience on online ads message effectiveness. *Journal of Advertising*, **33**(1), pp. 55–69.

Internet Advertising Bureau (2006) Internet advertising revenues continue to accelerate at an unprecedented rate with a 36% increase for first half of '06. Press release online at http://iab.net (accessed 11 December 2006).

Joreskog, K.G. (1971) Statistical analysis of sets of congeneric tests. *Psychometrika*, **36**(2), pp. 109–133.

Ko, H., Cho, C.H. & Roberts, M.S. (2005) Internet uses and gratifications. *Journal of Advertising*, **34**(2), pp. 57–70.

Korgaonkar, P.K. & Wolin, L.D. (1999) A multivariate analysis of web usage. *Journal of Advertising Research*, **39**(2), pp. 53–68.

LaFerle, C. & Kim, H.J. (2006) Cultural influences on internet motivations and communication styles: a comparison of Korean and US consumers. *International Journal of Internet Marketing and Advertising*, **3**(2), pp. 142–157.

LaRose, R. & Eastin, M.S. (2004) A social cognitive theory of internet uses and gratifications: toward a new model of media attendance. *Journal of Broadcasting & Electronic Media*, **48**(3), pp. 358–377.

McGowan, K.M. & Sternquist, B.J. (1998) Dimensions of price as a marketing universal: a comparison of Japanese and US consumers. *Journal of International Marketing*, **6**(4), pp. 49–66.

McMillan, S. & Hwang, J.S. (2002) Measures of perceived interactivity: an exploration of communication, user control, and time in shaping perceptions of interactivity. *Journal of Advertising*, **31**(3), pp. 41–54.

Mulaik, S.A., James, L.R., Van Alstine, J., Bennett, N., Lind, S. & Stilwell, C.D. (1989) Evaluation of goodness-of-fit indices for structural equation models. *Psychological Bulletin*, **105**(3), pp. 430–445.

Nunnally, J.C. & Bernstein, I.H. (1993) *Psychometric Theory* (3rd edn). Englewood Cliffs, NJ: McGraw-Hill.

Papacharissi, A. & Rubin, A.M. (2000) Predictors of internet use. *Journal of Broadcasting & Electronic Media*, **44**(2), pp. 175–196.

Parker, B.J. & Plank, R.E. (2000) A uses and gratifications perspective on the internet as a new information source. *American Business Review*, **18**(2), pp. 43–49.

Peter, J.P. (1979) Reliability: a review of psychometric basics and recent marketing practices. *Journal of Marketing Research*, **16**(1), pp. 6–17.

Reise, S.P., Widaman, K.F. & Pugh, R.H. (1993) Confirmatory factor analysis and item response theory: two approaches for exploring measurement invariance. *Psychological Bulletin*, **114**(3), pp. 552–566.

Rodgers, S. (2002) The interactive advertising model tested: the role of motives in ad processing. *Journal of Interactive Advertising*, **2**(2), available online at http://jiad.org/vol2/no2/rodgers.

Rodgers, S. & Sheldon, K.M. (2002) An improved way to characterize internet users. *Journal of Advertising Research*, **42**(5), pp. 85–94.

Rodgers, S. & Thorson, E. (2000) The interactive advertising model: how users perceive and process online ads. *Journal of Interactive Advertising*, **1**(1), available online at http://jiad.org/vol1/no1/rodgers.

Rodgers, S., Jin, Y., Rettie, R., Alpert, F. & Yoon, D. (2005) Internet motives of users in the United States, United Kingdom, Australia, and Korea: a cross-cultural replication of the WMI. *Journal of Interactive Advertising*, **6**(1), online at http://jiad.org/vol6/no1/rodgers/index.htm (accessed on 11 May 2006).

Sheehan, K.B. (2002) Of surfing, searching, and newshounds: a typology of Internet users' online sessions. *Journal of Advertising Research*, **42**(5), pp. 62–71.

Song, I., LaRose, R., Eastin, M.S. & Lin, C. (2004) Internet gratifications and Internet addiction: on the uses and abuses of new media. *Cyber Psychology and Behavior*, **7**(4), pp. 385–395.

Stafford, T.F. & Stafford, M.R. (2001) Identifying motivations for the use of commercial web sites. *Information Resources Management Journal*, **14**(1), pp. 22–30.

Strasheim, A., Pitt, L. & Caruana, A. (2007) Psychometric properties of the Schlinger Viewer Response Profile: evidence from a large sample. *Journal of Advertising*, **36** (forthcoming).

Svennevig, M. (2000) Needs, not nerds: researching technological change. *International Journal of Advertising*, **19**(5), pp. 645–663.

Weiss, D. (2005). Internetnutzung im studium – Erklarung and vorhersage der internetnutzung von studierenden in Deutschland und Osterreich. *Psychologie–Medienpsychologie*, **135**(1, 3), p. 135.

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