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Trustworthiness of product review blogs: A source trustworthiness scale validation

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With the introduction of Web 2.0, online blogging has established its place in the lexicon of public relations management. Especially blogs that offer reviews of products, services and technologies, have become essential to practitioners of public relations in their dialogue with the market place. From a public relations perspective, this paper addresses the source trustworthiness of product review blogs among online consumers, and whether consumer demographics have a significant impact on their level of trust. This paper reports the adaptation of a scale to measure the construct of source trustworthiness in the context of blogs. The results of a survey among 169 Australian online consumers confirmed the validity of the scale in the blogging context. Findings suggest that while source trustworthiness does not appear to be strongly related to either gender or level of education, younger consumers exhibit higher levels of source trustworthiness. Managerial implications are drawn from these findings and avenues for future research are identified.

Key words: Source trustworthiness, trust, public relations, product review blogs, blogging.

INTRODUCTION

The Internet has become essential to practitioners of public relations (PR) in their dialogue with the market place as well as with improving the productivity and efficiency in their research and issues management (Ryan, 2003; Sallot et al., 2004; Porter and Sallot, 2005). With the introduction of Web 2.0, the next generation of the Web, blogging has established its place in the PR lexicon (Kent, 2008; Xifra and Huertas, 2008; Smith, 2010).

From simple person-to-person word-of-mouth communications, blogs exponentially amplifies mass consumer-to-consumer communication at an un-precedented level (Vilpponen et al., 2006). Complementary to other types of online social media, blogs not only enable organizations to communicate with all stakeholders, they also enable easy and free communications among stakeholders (Mangold and Faulds, 2009). Unquestionably, communication professionals and

practitioners need to understand stakeholder perceptions of blogs and how to most effectively use blogs as part of their communications strategy.

A crucial stakeholder perception to address is their trust in the information provided by blogs and their perception of the trustworthiness of blog writers. Unless trustworthiness is at an acceptable level, organizations will be, and rightly should be, careful if employing blogs in their communications. According to Edelman and Intelliciseek's (2005) survey, "people's trust has shifted from authority figures to average people, like you." Their study shows that only 56% of Americans are likely to trust the opinions of physicians and academics to a greater extent than they trust the opinions of people similar to themselves. Their findings support the fact that product review blogs are increasingly popular among consumers. Blog writers who share their opinions with others are numerous and their numbers are growing exponentially, covering all possible genres and topics. While many bloggers are not necessarily experts, consumers tend to increasingly use product review blogs to minimize advertising noise and confusion and to gain an honest peer evaluation of a product, service or technology.

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However, a key question is to what extent blog readers perceive these product review blogs as a truly credible source. Many scholars identify 'trustworthiness' and 'expertise' as two key components of source credibility (Hovland et al., 1953; Self, 1996).

Hovland et al. (1953) have defined expertise and trustworthiness as follows: "*Expertise* refers to the extent to which a communicator is perceived capable of making valid assertions, while *trustworthiness* is the degree to which the audience perceives that the communicator intends to convey valid assertions" (Tripp et al., 1994).

An antecedent to source credibility is the nature of the relationship, if any, between the blogger and specific stakeholders in the product, service, or technology under review. Some bloggers receive corporate sponsorship in the form of compensation or other benefits from the related stakeholders such as manufactures and their agencies. Consequently, there has been concern that some bloggers who review products may not provide truly unbiased reviews and are therefore in violation of good business practices.

From a public relations perspective, this paper specifically addresses the source trustworthiness of these blogs among online consumers, and whether consumer demographics have a significant impact on their level of trust. To confirm these issues, the following hypotheses are formulated:

Scale validity hypothesis: The scale adapted from the traditional concept of source trustworthiness accurately measures the source trustworthiness in the blogging context.

H₁: Consumers (blog readers) perceive product review blogs as a trustworthy source.

H₂: A significant correlation exists between the perception of blog readers on the source trustworthiness of blogs and basic demographic descriptors such as gender, age and level of education.

H₃: A significant relationship exists between the perception of blog readers on the source trustworthiness of blogs and the other consumer blogging behaviors, such as how frequently they access and read blogs and the number of blogs they access.

Therefore in this paper, we begin by briefly reviewing the employment of blogs as a public relations communication tool. We then describe the concept of trust and source trustworthiness toward organizational communication and then outline the adaptation of a scale to measure the construct of source trustworthiness in the context of blogs and blogging. Next, we describe a study among online consumers to measure source trustworthiness by employing the amended scale. Certain aspects of the psychometric properties of the amended source trustworthiness scale are also addressed. Source trustworthiness is then analyzed against two blog usage

constructs (the frequency of accessing blogs and the number of different blogs visited on average in a month) and a comparison was drawn across some basic demographic descriptors of the sample. This article concludes with the managerial implications, an acknowledgement of the limitations of this research, and further research avenues suggested by the results.

BLOGS IN PUBLIC RELATIONS

As blogging technology enables readers of blogs to contribute to public comments, it has a profound impact on the public relations function. While a substantial number of blogs are being used for purposes other than marketing, a small proportion are focused exclusively on the marketing of products and services (Marken, 2006).

Cho and Huh (2010) commented that while the proportion of all corporations that use blogs as a corporate communications tool is still small, the number is rapidly increasing. Companies are using 'corporate blogs' to enhance internal communications among their staff, as well as to improve public relations with external stakeholders.

In addition to corporate blogging, consumer bloggers maintain their own blogs that are focused on reviewing the products, services and technologies offered by corporations. Some of these bloggers are compensated by corporations or their agencies, while some are not. Corporate communication practitioners, public relations professionals and academics need to understand the advantages and disadvantages of using blogs in public relations.

Some authors, including Porter et al. (2007), stated that blogs are not yet considered as a standard public relations tool and Kent (2008) criticized that their utility as a public relations tool is currently limited. Kent (2008) argues that while many PR professionals are suggesting that blogs have tremendous potential as a tool for online communication and for reaching diverse publics, more scholarly research needs to be conducted before the majority of organisations will appreciate the importance of blogging. He commented that the blogging stampede should not trample PR professionals until scholars, researchers and especially PR professionals truly understand the effectiveness of blogging.

In an extensive overview, Kent (2008) describes the strengths and weaknesses of blogs as a public relations tool. He argues that blogs have several strengths, including their usefulness as a research tool as well as for message framing and persuasion. He believes blogs are particularly useful for research, issue monitoring, and environmental scanning.

The emergence of Web 2.0 offers new communication technologies in practice and brought both major challenges and major opportunities to public relations (Toledano, 2010). In this regard, blogs play an important

role in shaping PR 2.0. Blogs have been used as an important information distribution channel and as a knowledge-sharing tool (Droge et al., 2010). This communicative use of blogs in public relations enables PR professionals and marketing practitioners to use blogs as a market research tool to analyse the market and gauge public opinion on their business (Xifra and Huertas, 2008). It permitted new product development managers to share experiences about their products with the lead consumers and co-create value with them (Droge et al., 2010). On the other hand, due to the user generated content nature of blogs (Mutum and Wang, 2010), blogs have empowered consumers to contribute instant feedback by posting comments directly (Xifra and Huertas, 2008) and use blogs as a strong word-of-mouth communication channel (Droge et al., 2010; Riegner, 2007).

Corporate blogs, as well as consumers blogging about corporations, their products, services and technologies are multiplying at an unprecedented rate; however the utility of blogs is currently limited as a PR tool (Kent, 2008).

Although, blogs have incredible potential to be used as research and persuasion tools, there is still consumer skepticism toward this new form of marketing communications. Blogs cannot be taken to their full advantage unless we fully understand how to increase consumer trust and the level of source trustworthiness towards blogs.

THE CONCEPT OF TRUST AND SOURCE TRUSTWORTHINESS

Trust has been frequently stated in literature and the notion of trustworthiness is typically embedded in the concept of trust (Hardin, 2002). Larzelere and Huston (1980) stated that trust is most frequently defined as a belief by a person in the integrity of another individual, and the conceptualization of trust in the literature leads to the following definition: "trust exists to the extent that a person believes another person (or persons) to be benevolent and honest."

Morgan and Hunt's (1994) commitment-trust theory of relationship marketing conceptualize trust as existing when one party has confidence in an exchange partner's reliability and integrity. The authors suggest that 'confidence' is built when the trusting party comes to a solid belief that the trustworthy party is 'reliable' and has 'high integrity', and that it is linked to qualities such as 'consistent, competent, honest, fair, responsible, helpful, and benevolent'.

Morgan and Hunt (1994) argue that trust is a fundamental concept in relational exchanges as it has been a common topic in studies on social exchange. In an extent review, Bruner (2009) discusses that trust has been studied in various fields, including organizational behavior (Barney, 1990), communications (Hovland et al.,

1953), services marketing (Berry and Parasuraman, 1991), strategic alliances (Sherman, 1992), retailing (Berry, 1993), buyer-seller bargaining situations (Schurr and Ozanne, 1985), and in studies conducted by the industrial marketing and purchasing group (Ford, 1990; Håkansson, 1982).

Thus, trust implies the reasons for which the relevant party is considered to be trustworthy (Hardin, 2002). Trustworthiness, on the other hand, can have diverse meanings from discretion, reliability, competence, integrity to empathy (Sheppard and Sherman, 1998). The meaning of trustworthiness is related to the assumption of the type of *risk* that people take at exchanging information. The risk refers to the possibility that the source of information does not accept moral responsibility or is unable to provide correct information. Hence, the information seeker needs to judge whether or not the source is sufficiently knowledgeable or skilful on one hand and on the other, whether they are honest and truthful (Hertzum et al., 2002).

Trustworthiness along with *expertise* constructs credibility (Hovland et al., 1953). The honesty of the source or motivation to offer valid information is referred to as source trustworthiness which, by itself, is a dimension of source credibility (Kelman and Hovland, 1953; McGuire, 1985). In other words source trustworthiness describes qualities such as being well-intentioned, truthful and unbiased (Tseng and Fogg, 1999). From a communication perspective, however, McGuire (1985) argues that when a spokesperson truly believes in the information they deliver, they build trustworthiness.

Accordingly, in advertising a product a loyal product user is the most reliable appeal candidate, since they most likely will recommend a product based on their own successful personal experience. A trustworthy product endorser tends to give testimonial evidence on behalf of a product and expresses their belief and opinion on the product's value as a product user (McGuire, 1985). Untrustworthy sources, on the other hand, provoke challenges for information seekers (Priester and Petty, 1995). This is because in the absence of trust, information seekers are forced to judge the legitimacy of the source's information (Tormala and Clarkson, 2008).

Blogs have the potential to present a human face to a company's self-presentation and interaction with customers, which leads to building trust (Dwyer, 2007). Yang and Lim (2009) also found that blogger credibility plays a positive role in building relational trust. They proposed a theoretical model in explaining relational trust as a central outcome of effective blog-mediated public relations. Interestingly, Chesneya and Sub (2010) found no difference in perceived credibility when the bloggers are identifiable and when they are anonymous.

Kelleher (Kelleher and Miller, 2006; Kelleher, 2009) argued that conversational human voice communicates more effectively via organizational blogs than traditional

newsletter-type material posted online. In crisis communications, Sweetser and Metzgar (2007) found that organizational blogs were superior in communicating a conversational voice during a crisis situation. In a similar context, Schultz et al. (2011) found that the medium seems to be more important than the message. They described tweets, as a micro-blogging tool, had the most positive effect on secondary crisis communication. However, Yang et al. (2010) stated that in crisis situations source credibility seems to have minimal effects on post-crisis outcomes.

Source trustworthiness is a critical measure of the success of blogs in the communications toolbox of PR practitioners. The extent of source trustworthiness needs to be understood as well as the possible impact of consumer demographics on source trustworthiness. Literature suggests that the impact of demographics on perceived source trustworthiness of online reviews has been examined in two general venues: the impact of demographics of the source (blogger) on perceived source trustworthiness and the impact of the demographics of the receiver (blog reader) on perceived source trustworthiness. Most studies have examined the impact of demographics of the source (blogger) on perceived trustworthiness or credibility (Armstrong and Nelson, 2009; Flanagin and Metzger, 2003; Xie et al., 2011).

Armstrong and Nelson (2009) show that male authors were deemed more credible than female authors and Xie et al. (2011) confirm that the presence of personal identification, like name, state of residence and gender has a positive effect on the perceived credibility of online reviews. Other studies examined the impact of demographics of the receivers (blog readers) on their perceived source trustworthiness or credibility (Johnson and Kaye, 2004; Johnson et al., 2008; Kim, 2006). Johnson et al. (2008) suggest men consistently judge blogs as more credible than women do, however studies by Kim (2006) and Johnson and Kaye (2004) show that demographics cannot strongly predict credibility of blogging.

Adaptation of a scale to measure source trustworthiness of blogs

The conceptualization of source trustworthiness was primarily formed during 1940s and 1960s by researchers attempting to discover the dimensions of source credibility (Hovland et al., 1953; Markham, 1969). Researchers realized that trustworthiness of the source is an important latent construct in measuring persuasion.

To accurately assess the level of trustworthiness, a multi-item scale is preferred over a single item Likert scale or even a semantic differential scale such as trustworthy versus untrustworthy (Ohanian, 1990). Therefore, since 1970s with the concerns of the newspaper

industry about people switching to radio and television for receiving the news (Johnson and Kaye, 2004), more researches were conducted in order to find source trustworthiness dimensions by using explorative factor analysis techniques. Table 1 provides an overview of commonly used items in trustworthiness scales in the marketing context with a Cronbach's alpha (α) greater than 0.8 (Bruner, 2009).

A recommended source trustworthiness scale would be composed of various semantic differentials measuring a component of source credibility relating primarily to honesty and sincerity (Bruner, 2009). Several applications of such trustworthiness scales have been made in different contexts such as the trustworthiness of a company (MacKenzie and Lutz, 1989); trustworthiness of non-celebrity product endorsers (Moore et al., 1994); and credibility of celebrity endorsers (Ohanian, 1990, 1991; Till and Busler, 2000; Tripp et al., 1994).

Literature shows that the dimensions of source trustworthiness as a concept vary among different studies depending on the kind of media on which each research has focused (Rieh and Danielson, 2007). For example, for years 'dynamism' was acknowledged as a major dimension of credibility, however when the focus of source credibility studies was shifted from spokespersons credibility to the print news credibility, the role of dynamism diminished (Rieh and Danielson, 2007). Therefore it is necessary to validate the scales that were designed for measuring the traditional concept of source trustworthiness before using them into another context. For this reason, this paper validates the adaptation of source trustworthiness scale to measure the construct of source trustworthiness in the context of blogs.

Ohanian (1990, 1991) is regarded as the primary source for most of the source trustworthiness studies as acknowledged by Bruner (2009). Ohanian (1990) developed a scale for measuring celebrity endorsers' perceived expertise, trustworthiness and attractiveness. After several exploratory and confirmatory analyses to refine the scales, she used five semantic items to measure trustworthiness: Dependable / Undependable, Honest / Dishonest, Reliable / Unreliable, Sincere / Insincere, Trustworthy / Untrustworthy. Ohanian (1990) initially employed eight items to measure the trustworthiness dimension, but subsequently deleted the three items with the lowest item-to-total correlations namely fair, truthful and ethical.

In a similar context, Tripp et al. (1994) examined celebrities as endorsers and specifically the effects of multiple product endorsements by a single spokesperson. The authors based their items on work by McCroskey (1966) but refined and validated a 7-item, 7-point semantic differential scale to measure the subject's perception of celebrity trustworthiness. The items in the Trip et al. (1994) scale were: Insincere / Sincere, Dishonest / Honest, Not trustworthy / Trustworthy, Not credible / Credible, Not biased / Biased, Not believable

Table 1. Commonly used items in trustworthiness scales based on the marketing scale inventory by Bruner (2009).

Reference	Cronbach's α	Sincere	Honest	Dependable	Trustworthy	Credible	Biased	Believable	Reputable	Reliable	Truthful	Convincing	Expert	True
Andrews et al. (2000)	0.89				✓	✓		✓						
Andrews et al. (1998)	0.89				✓	✓		✓						
Bobinski et al. (1996)	0.91	✓	✓	✓	✓	✓								
Bower and Landreth (2001)	0.93	✓	✓	✓	✓					✓				
Goldsmith et al. (2001)	0.85		✓		✓						✓			
Kozup et al. (2003)	0.93		✓	✓	✓									
MacKenzie and Lutz (1989)	0.82						✓	✓				✓		
Moore et al. (1994)	0.80	✓					✓	✓			✓			
Ohanian (1990)	0.89	✓	✓	✓	✓					✓				
Putrevu (2004)	0.93	✓	✓					✓						✓
Sengupta and Johar (2002)	0.86				✓	✓		✓					✓	
Shamdasani et al. (2001)	0.94	✓	✓	✓	✓					✓				
Stafford et al. (2002)	0.91	✓	✓	✓	✓					✓				
Till and Busler (2000)	0.95	✓	✓	✓	✓					✓				
Tripp et al. (1994)	0.88	✓	✓		✓	✓	✓	✓	✓					

/ Believable, and Disreputable / Reputable.

In our research the scales developed by Ohanian (1990) and Tripp et al. (1994) were combined, adapted and applied to the blogging context. Therefore, to measure the source trustworthiness of blogs, we employed a 9-item, 7-point semantic differential scale. The adjectives were: Insincere / Sincere, Dishonest / Honest, Not dependable / Dependable, Not trustworthy / Trustworthy, Not credible / Credible, Not biased / Biased, Not believable / Believable, Disreputable / Reputable, Unreliable / Reliable.

RESEARCH METHODOLOGY

In this section, we first address the sample design as well as the data collection, followed by a discussion of the survey instrument and the measurement scales employed. Data collection was conducted in Australia by a large

provider of pre-recruited, managed, online consumer panels. According to Australian Bureau of Statistics (2011), 79% of Australian households have access to the internet (92% broadband) and most households (77%) are using it every day. The highest proportion of individuals accessing the internet is the persons aged 18 to 24 years (96%) and 85% of them use online social networking sites. However, more than 70% of people above 55 years do not use social networking sites.

Based on Australian Bureau of Statistics (2011), in populations with higher education levels, the proportion of the population accessing the internet is higher. Thus, a non-probabilistic sample of respondents was selected by using a quota sample applied to the demographic characteristics of age and gender, thus ensuring that our sample would roughly represent the Australian national adult online population. The specific target for this survey was defined as Internet users between the ages of 18 and 49. A total of 400 panel members were invited via email and 169 completed the survey by the cut-off date, providing us with an effective response rate of 42.25%. All 169 completed surveys (100%) were usable and therefore were included in the analysis. The participants were

incentivised upon completion of the short survey by a small number of member-points which could accumulate over time, to be redeemed later for various prizes.

The aim of this survey was to study the attitudes of Internet users towards 'blogs', which were explicitly described to respondents as 'online blogs that review or discuss products, services, and technologies, and generally do not attempt to sell anything, and are written by consumers and not by the companies who produce the products, services or technologies they write about.' The survey instrument consisted mainly of the following five sections:

1. A 9-item scale adopted from Ohanian (1990) and Tripp et al. (1994) to measure trustworthiness (Table 3). All items were scored on a 7-point semantic differential scale.
2. According to the vast use of 'truthful' as an adjective of 'source trustworthiness' in the literature (Ohanian, 1990; Moore et al., 1994; Tseng and Fogg, 1999; Goldsmith et al., 2001), we have included this item as the criterion validator. This overall single-item scale measured respondents' overall perceptions regarding the truthfulness of blogs (a 4-point Likert-type scale anchored on 1 = Very

Table 2. Respondents: Basic demographics.

Category	Percent of total
Male	52.7
Female	47.3
18 – 29 years	30.8
30 – 39 years	34.3
40 – 49 years	34.9
High school not completed	16.6
High School completed	18.3
Beyond high school	65.1

Table 3. Source trustworthiness of blogs scale descriptive statistics of 7-point semantic differential scale.

S/N	Item ¹	Mean	Std. Dev	Factor loadings
1	Insincere / sincere	4.57	1.13	0.827
2	Dishonest / honest	4.52	1.06	0.795
3	Not dependable / dependable	4.36	1.16	0.838
4	Not trustworthy / trustworthy	4.44	1.19	0.886
5	Not credible / credible	4.37	1.24	0.862
6	Not biased / biased	3.65	1.32	n/a
7	Not believable / believable	4.47	1.19	0.870
8	Disreputable / reputable	4.42	1.05	0.742
9	Unreliable / reliable	4.36	1.19	0.884

¹, Cronbach's Alpha: 0.95 with item 6 (Not biased / Biased) removed from the scale.

untruthful, through 4 = Very truthful).

3. A single-item 6-point Likert type scale capturing how frequently respondents read online blogs that review products, services, and technologies, anchored on '1 – never' through '6 – very frequently'.

4. An open-ended question asking respondents to indicate the number of different blogs that they access on average in a month.

5. Demographic variables including gender, age and highest level of education attained.

RESULTS AND DISCUSSION

A number of 169 online consumers participated in the study (52.7% were male). Table 2 shows the key demographics of the respondents. The means and standard deviations of the responses to the 9-item source trustworthiness scale items are shown in Table 3. Principal component factor analysis was performed on the 9-item in order to assess the dimensionality of the items as a single construct. This led to the extraction of two factors explaining a total of 77.32% of the variance.

All the items with the exception of item 6 (Not biased / biased) loaded strongly onto the first factor. Item 6 loaded strongly onto the single-item second factor which may be a result of the misinterpretation of the reversed scale. Not biased / biased is the only reversed phrased item in the original Tripp et al. (1994) source trustworthiness scale,

and were accordingly reverse scored in our analysis.

By eliminating Item 6 in the next analysis, a single factor emerged which explained 74.06% of the variance. Both the Cronbach's alpha and a principal components factor analysis suggested this item to be unstable as respondents probably misinterpreted the direction of this scale item, and consequently this item was removed without significantly compromising the scale integrity. The Cronbach's alpha computed for the reduced 8-item scale was 0.95 (by comparison, Tripp et al. (1994) reported reliability coefficients exceeding 0.88). This indicates that the scale possesses high internal consistency.

We therefore concluded that source trustworthiness in this context is a uni-dimensional construct, and that the scores on the eight remaining items could be summed to produce an overall source trustworthiness score. In this case, a low score would indicate a low source trustworthiness of blogs. A high score on the other hand, would imply high source trustworthiness.

To assess the validity of the scale, two tests were performed. The means on the summed source trustworthiness scale were tabulated against the overall evaluation of blogging's truthfulness, as provided by the respondents on a 4-point scale. This single-item scale measured the response to the following statement: 'Taking into account everything you know or have heard of about

Table 4. Source trustworthiness scale validity.

Response	Very untruthful	Untruthful	Truthful	Very truthful
Number of respondents	8	26	127	8
Mean trustworthiness	3.03	3.41	4.67	5.48
Number of observation	Overall truthfulness mean		Std. deviation	
169	2.80		0.593	
R square	Adjusted R square		Std. Error of the estimate	
0.338	0.334		0.484	
β	t		p value	
0.582	9.240		0.000	
Analysis of variance (ANOVA)				
Source	df	Sum of squares	Mean square	F Ratio
Model	1	20.013	20.013	85.376
Error	167	39.147	0.234	Prob > F
C. Total	168	59.160		< 0.0001

online blogs that review products, services, and technologies, please indicate whether you feel these blogs are generally truthful, or untruthful.' The results are indicated in Table 4.

The convergent validity of the scale was first assessed as is shown in Table 4, by means of a regression procedure, with the mean *source trustworthiness* score as the predictor variable and perceptions of *truthfulness* of blogs as the criterion. A high correlation between the construct being studied and an independent but conceptually related construct, is usually taken as evidence of convergent validity (cf. Carman, 1990; Pitt et al., 1995). In the regression conducted, the resulting R^2 was highly significant ($R^2 = 0.34$, $F(1,167) = 85.38$, $p < 0.001$), which means that an individual's score on the source trustworthiness scale is also highly correlated with their overall assessment of blogging's truthfulness as a related, but independent, construct.

Confirmatory factor analysis (CFA) was used as a further assessment of construct validity of the trustworthiness scale. Structural equation modeling (SEM) with AMOS 7 was used to perform one factor model CFA, where the trustworthiness latent variable values were manifested by eight observed variables. The χ^2 test yields a value of 55.39, which was evaluated with 20 degrees of freedom, has a corresponding p-value < .001. Thus, the χ^2/df is < 5, while the root mean square error of approximation (RMSEA = 0.10), root mean residual (RMR = 0.03), adjusted goodness of fit index (AGFI = 0.86), comparative fit index (CFI = 0.97), normed fit index (NFI = 0.95) and goodness of fit index (GFI = 0.92) figures suggest that the model fits the data reasonably well. We acknowledge that a value of about 0.08 or less for the RMSEA would indicate a reasonable error of approximation, however in line with Browne and Cudeck

(1993) we would not want to employ a model with a RMSEA greater than 1 (Browne and Cudeck, 1993: 144). Thus, the model just fits the data. The average variance extracted (AVE) resulted in a value of 0.706 and the composite reliability (CR) was computed as 0.930. As shown in Table 3, all factor loadings exceed 0.7 ($p < .000$), as an indication of convergent validity.

Content validity determines how inclusive a scale is for the range of meanings of a given concept (Babbie, 1992). Some authors (Carman, 1990; Pitt et al., 1995) believe that a visual assessment of the simple linear tabulation between a construct and another independent, though conceptually related construct, can be a concrete indication of content validity.

Our results demonstrate that the participants who score blogs higher on source trustworthiness, also state that blogs are more truthful. However those who score blogs lower on source trustworthiness believe them to be either untruthful or very untruthful. This serves as a good indicator of content validity.

The overall source trustworthiness (the means on the summed source trustworthiness scale) as the dependent variable, and the demographic descriptors as predictors were computed in a one-way analysis of variance (ANOVA), which is presented in Table 5.

The following observations can be made from Table 5. First, overall source trustworthiness seems totally unrelated to gender, as there are no statistical significant differences ($F(1,167) = 0.017$, $p = 0.895$) between males and females. Second, age seems somewhat related to source trustworthiness ($F(2,167) = 4.380$, $p = 0.014$). The Tukey-Kramer HSD post-hoc comparisons of the three age groups suggests that the 18- to 29-year age group assigns a significantly higher source trustworthiness to blogs (Mean = 4.74) than the 40-49 year age

Table 5. Summary of ANOVA procedures: Demographics as predictor, and source trustworthiness as criterion variables.

Gender	Number	Mean	Std. D.	F Ratio	Prob > F
Female	80	4.45	1.12	0.017	0.895
Male	89	4.43	0.87		
Age	Number	Mean	Std. D.	F Ratio	Prob > F
18-29	52	4.74	0.86	4.380	0.014
30-39	58	4.42	1.01		
40-49	59	4.19	1.02		
Education	Number	Mean	Std. D.	F Ratio	Prob > F
< High school	28	4.30	1.09	1.269	0.284
High school	31	4.25	0.85		
> High school	110	4.53	1.00		

Table 6. Summary of regression– Blog frequency and number of blogs accessed as predictor, and source trustworthiness as criterion variables.

Predictor variable	Mean	Std. Dev.	R ²	F Ratio	β	t	p value
Blog frequency	3.92	1.48	0.196	40.636	0.442	6.375	0.001
Number of blogs accessed	7.42	12.29	0.043	7.510	0.207	2.740	0.007

group (Mean = 4.19). Third, source trustworthiness does not seem to be significantly related to education ($F(2,167) = 1.269, p = 0.284$) among the three levels of education.

To understand the impact of additional variables on source trustworthiness, we investigated the frequency with which respondents accessed blogs, as well as the number of different blogs they accessed over a specified period by conducting two separate regressions. Blog reading frequency was measured by asking respondents how frequently they read online blogs that review products, services and technologies. This was scored on a 6-point scale anchored on 1 = never, through 6 = very frequently (Mean = 3.92; S.D. = 1.48).

An open-ended question probed respondents on the number of different blogs that they access on average in a month. Table 6 shows the means and standard deviations on these two items, as well as a summary of their regressions on the source trustworthiness measurement. It is evident that there are significant (albeit not very strong) relationships between both the frequency with which respondents access blogs and source trustworthiness ($R^2 = .20, F(1,167) = 40.64, p < 0.0001$), as well as the number of blogs respondents' access together with their views on source trustworthiness ($R^2 = .043, F(1,167) = 7.51, p < 0.007$).

In order to check whether age is a significant predictor of source trustworthiness when controlling for additional variables such as number of access blogs and blogs frequency, a one-way analysis of covariance (ANCOVA) was conducted. Age was considered as the independent

variable with three categories (18 to 29, 30 to 39 and 40 to 49), the source trustworthiness was taken as the dependent variable and the number of different blogs accessed and blog frequency was put as the covariates.

A preliminary analysis evaluating the homogeneity of regression assumption indicated that the relationship between the covariates and the dependent variable did not differ significantly as a function of the independent variable, $F(2, 166) = 1.79, p = .169$. The ANCOVA was not significant, $F(2, 164) = 1.05, p = .349$, indicating age is not a significant main effect (Table 7).

Conclusion

The Ohanian (1990) and Tripp et al. (1994) scales were combined and adapted to measure Australian respondents' source trustworthiness toward blogs that review or discuss products, services and technologies. Applied in this new media context, this scale exhibits internal consistency as well as evidence of both content and convergent validity.

Factor analysis suggests that the construct in this instance is uni-dimensional, so that scores on the reduced eight items comprising the scale may be summed to provide an overall indication of an individual's perceptions of source trustworthiness of blogs. While source trustworthiness does not seem to be related to either gender or level of education, there appears to be some relation to age. The younger respondents exhibited

Table 7. Analysis of co-variance for source trustworthiness by age.

Independent variable	Sum of squares	df	Mean square	F	Sig.
Number of blogs accessed	0.055	1	0.055	0.069	0.793
Blog frequency	20.688	1	20.688	25.822	0.000
Age	1.697	2	0.849	1.059	0.349
Error	131.393	164	0.801		
Total	3496.188	169			

Dependent variable: Source trustworthiness.

higher levels of source trustworthiness while the oldest group scored significantly lower.

Thus, unlike Johnson et al. (2008) that suggest men perceive blogs more credible than women, the results of this study propose that demographics are not a strong predictor of source trustworthiness in the blogging context, supporting past researches such as Johnson and Kaye (2004), Kim (2006) and a more recent study by Ghazisaeedi (2012), stating that the influence of demographics on blog credibility diminished when blog readers become more demographically mainstream.

Furthermore, there is a positive and significant relationship between source trustworthiness and both the frequency with which respondents access blogs and the number of blogs accessed. Consequently, the results of this research confirms past studies suggesting that heavy blog readers rated blogs more credible than light blog users (Greer, 2003; Johnson et al., 2008; Johnson and Kaye, 2010).

MANAGERIAL IMPLICATIONS

The results of this study contain a number of implications for marketing and communication managers, as well as for PR professionals. The source trustworthiness scale was adapted from two other scales used in measuring celebrity endorsers' perceived trustworthiness. The purpose of this study was to validate a scale to measure source trustworthiness of blogs that review products, services and technologies. This scale seems to possess robust psychometric properties and in general it can be used as a measurement tool to gauge trustworthiness towards blogs.

PR professionals can progress beyond the scope of this study and employ this scale to gauge consumer perception of the source trustworthiness of blogs in certain market segments, for specific products, services or technologies, or evaluate the level of source trustworthiness within other demographic groups or across diverse cultures. In addition to employing this scale across different target markets, it could also be used to assess source trustworthiness of various types of blogs or specific blog writers.

The results of this study suggest that blogs are a more

appropriate PR tool when companies are targeting younger segments. If the target market is older people, it may be more effective to use traditional communication channels, such as product reviews in print media such as newspapers and magazines, rather than product review blogs.

LIMITATIONS

This study has a number of limitations, the recognition of which should help refine future research efforts. The source trustworthiness scale was adapted from traditional media to an online blogging context. Although this scale seems to retain solid psychometric properties, there are some concerns that elements of trustworthiness exclusively related to blogs, blogging and public relations may not have been accounted for.

The Tripp et al. (1994) scale consists of seven items, of which one item (Not biased / Biased) was phrased in the opposite direction to the other six items. Our research found this item to be unstable as some respondents most likely misinterpreted the statement or mis-recorded their answer. While removal of this item from our analysis improved the psychometric properties, the original scale intended its inclusion. Researchers using this scale in the future would certainly benefit by having all items unidirectional.

There is still doubt whether the results of this study can be generalized to a broader international context and a broader age range, as our participants were limited to Australians aged 18 to 49.

This study specifically focuses on blog readers' views on source trustworthiness of blogs. The opinions of blog writers, public relation managers, marketing communication specialists, and other stakeholders were excluded.

Although this study permits limited generalization, unlike experimental studies, it cannot explain the exact circumstances and causes. While the source trustworthiness of product review blogs among a sample of online consumers has been demonstrated, it is hard to identify its causes or to predict its outcomes under different conditions. For example, while the results confirm that younger consumers generally perceive higher

levels of source trustworthiness, a qualitative approach is required to obtain richness and depth of insight.

While the results suggest that accessing blogs frequently and accessing a larger number of blogs may cause one to have higher source trustworthiness, the inverse direction of causality can also be true. Likewise it is possible that a higher level of source trustworthiness causes consumers to access a larger number of blogs more often.

Supposing the purpose of this study was to link source trustworthiness to any other well-defined multi-item constructs, the role of source trustworthiness would have been demonstrated in a broader context of behaviors.

FUTURE RESEARCH DIRECTIONS

Based on the results of this study, there are a number of avenues that can be pursued for further research. The source trustworthiness scale was adopted from two other measures used in a different context. It would be worthwhile to ensure that this scale accounts for all critical elements of trustworthiness. A qualitative study among blog readers and non-blog readers is recommended for a better understanding of trustworthiness in the blogging context.

One specific adaption for future use of this scale would be to phrase all scale items in a unidirectional manner (that is, all positive words to the left side of the semantic differential scale) to avoid confusion or mis-recording of answers by respondents.

This study has been done among Australian online consumers. It would be valuable to extend this study into a longitudinal investigation to track consumer perception on source trustworthiness towards blogs over time. Likewise, it would be interesting to expand this study to other countries and cultures.

Finally, as mentioned in limitations, this study has not attempted to link source trustworthiness to any other constructs. It would also be useful to examine the relationship between source trustworthiness and personal characteristics such as cynicism and personal self-esteem.

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