

Eastern Illinois University

From the Selected Works of Chao Wen

2012

Predicting potential respondents' decision to participate in web surveys

Chao Wen, *Eastern Illinois University*

Jiaming Fang, *University of Electronic Science and Technology of China*



Available at: https://works.bepress.com/chao_wen/7/

Predicting potential respondents' decision to participate in web surveys

Jiaming Fang & Chao Wen

Abstract: Web-based surveys have received increasing attention given the potential benefits of convenience, low cost, and time saving compared with other survey modes. However, the use of the internet to collect data is restrained by the lack of willingness of people to respond. The objective of this research is to expose the determinants of intention to participate in a web survey. Based on the theory of reasoned action, this research proposes a model encompassing attitude toward a web survey, social norm, moral obligation, trust in the sponsor of a survey, topic involvement, topic sensitivity, and reputation of the sponsor to predict a potential respondent's web survey participation intention. We examine the proposed model using a structural equation modelling procedure. The results indicate that attitude, social norm, moral obligation, reputation of sponsor, and trust in the sponsor exert positive effects on participation intentions in web surveys; attitude mediates the relationship between topic involvement and participation intention. However, topic sensitivity of the web survey has no effect either on attitude or on participation intention.

Keywords: web survey; survey service; survey design; survey participation; response rate; data collection.

Reference to this paper should be made as follows: Fang, J. and Wen, C. (2012) 'Predicting potential respondents' decision to participate in web surveys', *Int. J. Services Technology and Management*, Vol. 18, Nos. ½, pp.16–32.

Biographical notes: Jiaming Fang is an Assistant Professor at the School of Management and Economics, University of Electronic Science and Technology of China. His research interests include e-service, consumer behaviour, and cognitive processes underlying consumer choice on the web. His research has been published in such academic journals as *Cyberpsychology, Behavior and Social Networking*, *Computers in Human Behavior*, *International Transactions on Systems Science and Applications*, and *Tsinghua Science and Technology*.

Chao Wen is an Assistant Professor at the School of Business, Eastern Illinois University. He earned his PhD degree from University of North Texas, MS degree from the University of Electronic Sciences and Technology of China. He has published in the *Journal of Computer Information Systems and Cyberpsychology, Behavior, and Social Networking*. He has more than ten conference proceedings and presentations. His research interests include e-commerce, consumer behaviour, service operations, statistics education, and

supply chain management.

1 Introduction

Web surveys are surveys conducted online using computer and communications technology. Compared with the traditional paper-based surveys, web surveys have several advantages (Bosnjak et al., 2005; Fang et al., 2009). However, the validity of web survey results may be reduced because of the coverage limitation and the lack of willingness of people to respond. Coverage limitations could be alleviated by using mixed-mode design (Sala and Lynn, 2009), hence, low response rate of web survey becomes a more prominent concern (Fan and Yan, 2010; Millar and Dillman, 2011). Therefore, it is important to fully understand the likely mechanism underlying the non-response in web surveys. With a better understanding of the decision making process of potential respondents, practitioners and scholars can identify why individuals comply with or reject requests to participate web surveys and can manipulate some factors to increase the response rate.

Numerous studies have been conducted to explore the factors affecting participation willingness of web surveys, but most of these studies only inspected one or a few response-enhancing survey design factors and did not identify the psychological determinants involved in a decision against participation. These studies are limited in helping to theoretically understand the psychological process in (non) compliance to survey request (Bosnjak et al., 2005). Thus, there is a need to move beyond these studies and focus on respondent behaviour (Helgeson et al., 2002). A better understanding of response behaviour can be obtained by studying factors such as perceptions and attitudes that underlie survey response (Wijnen et al., 2007). To our knowledge, little research has been conducted from this perspective. By applying a psychological theory of human action, the decision-making process of participating in a web survey can be understood most appropriately (Bosnjak et al., 2005). Responding to suggestions by Bosnjak et al. (2005), we proposed a research model from a psychological perspective in order to better understand the psychological determinants in (non) compliance to survey request. Founded on the theory of reasoned action (TRA), this study mainly examines how psychological factors such as survey topic (e.g., topic involvement and topic sensitivity) and survey sponsorship (e.g., trust in the sponsor of a survey and reputation of the sponsor) influence the participation intention.

The remainder of the article is structured as follows: we begin with a review of the existing empirical evidence on factors affecting response rates in web surveys. The next three sections present the research hypotheses, research methodology and data analysis results, respectively. The paper concludes with theoretical and practical implications of the findings, and recommendations for further research.

2 Theoretical backgrounds

As an easy-to-use, low-cost, and highly flexible survey method, web survey is becoming increasingly popular (Bachmann et al., 1999; Cobanoglu et al., 2001; Fang and Shao, 2007). The advent of web survey is believed to be the next significant development in the survey methodology tradition after the random sampling in the 1940s and the telephone survey in the 1970s (Dillman, 2000). A large number of studies have been conducted to ascertain potential factors affecting web surveys. Roughly, these factors can be categorised into non-psychological and psychological factors (Bosnjak et al., 2005).

Non-psychological factors affecting response rates in web surveys can be further classified into survey design factors and demographic factors. A large volume of survey studies are striving for response maximisation by varying survey design factors. (e.g., Christian et al., 2007; Deutskens et al., 2004; Göritz, 2006; Heerwegh and Loosveldt, 2007) In general, visually-presented questionnaires, personalised salutations, incentives, number of contacts and precontacts are factors closely associated with higher response rates. Nevertheless, these studies aimed at increasing response rates by using post hoc analysis, and thus the opportunity of chance findings is increased. In addition, they are also rather limited in helping to theoretically comprehend the antecedent psychological processes resulting in (non)compliance to survey requests (Bosnjak et al., 2005).

Compared to the research involving inspecting non-psychological factors, far fewer studies to date have explored the factors from psychological perspectives. Bosnjak et al. (2005) initially utilised the extended version of the theory of planned behaviour (TPB) by incorporating moral obligation into their model to predict the number of participations in a web survey. They revealed that all coefficients of the four variables (attitude, subject norm, perceived behaviour control, and moral obligation) were significant. Fang et al. (2009) inspected the effects of innovativeness and trust on web survey participations and the results showed that these two factors could significantly affect web survey participation intention. Recently, Fang et al. (2012) examined the effects of the reputation of a survey's provider and the reputation of a survey's sponsor on the willingness of potential respondents to participate in a web survey.

Considering that the technology acceptance model (TAM), the TRA, and the TPB all concur behavioural intention, the extent to which an individual intends to perform specific behaviour is a critical variable in determining future behaviour. We anticipate the intention of a potential respondent to participate in a web survey leads to a subsequent action and a positive association exists between the intention and actual behaviour. In essence, intention reflects the extent to which people are willing to perform something. This relation has also been documented by many prior studies (e.g., Bosnjak et al., 2005; Pavlou and Fygenson, 2006). Therefore, to better understand the non-response mechanisms, it is sensible to identify the factors affecting potential respondents' intention to participate in web surveys.

Among all of the potential factors affecting response rates, survey topic and survey

sponsor ought to first attract potential respondents' attention (they always appear on a welcome page or in an e-mail survey invitation or survey banner ad). Previous research indicates that information acquired earlier in the decision process plays a much more significant role than information acquired later (Hoyer and MacInnis, 2010). It is expected that potential respondents formalise their initial participation intention or willingness mainly based on the assessment of these two factors. Hence, survey topic (topic involvement and topic sensitivity) and survey sponsor (trust and reputation) should exert substantial impacts on the decision of web survey participation. However, to our best knowledge, existing research has not yet explored whether and how these two factors can exert influences on survey participation willingness theoretically. Obviously, this is a crucial omission and an important topic to be investigated. Additional theoretical insights are needed to understand the role of topic and sponsor on participation willingness. This study attempts to fill the gap by proposing and empirically testing a model incorporating these two factors to explain and predict potential respondents' decision to participate in web surveys.

3 Research framework and hypotheses

3.1 The research framework

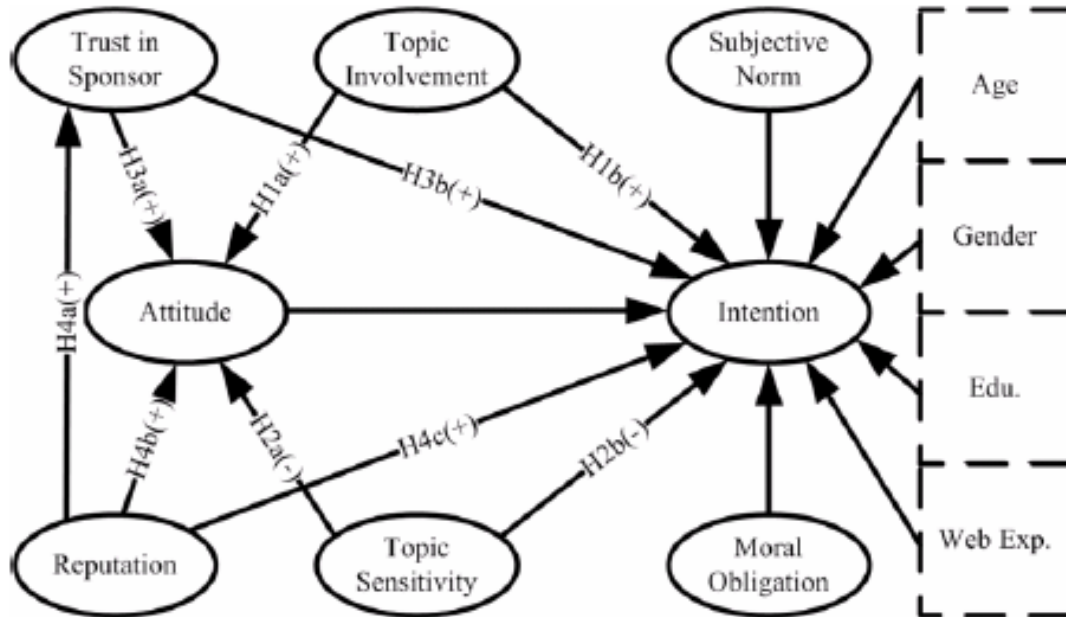
The TRA model provides a background for understanding the relationship between attitudes, intentions, and behaviours. Hox et al. (1995) used this model to specify psychological constructs and processes leading to a decision for or against participation in mail surveys. This model encompasses attitudes toward the behaviour and the subjective norm mediated by intention to influence the behaviour in question (Bosnjak et al., 2005). Bagozzi et al. (2000) also shows that the TRA model can be used to predict behaviour in different cultures. To keep in line with the prior research, TRA is also used as the fundamental model in this study.

The model is extended in this study by adding several constructs including moral obligation proposed by Bosnjak et al. (2005), topic involvement, topic sensitivity, trust in sponsor of survey, and reputation of the sponsor. Given that the demographic variables such as age, gender, education, and web experience may exert effects on participation intention; these variables are also included as control variables to avoid potential influence on intention to participate in web surveys. Figure 1 depicts the research model.

Attitude is defined as the positive or negative feelings toward a web survey. Subjective norm refers to the perception of social pressure by the potential respondents when they are required to participate in web surveys. It can be interpreted as whether a potential respondent's perception of the likelihood of participation in a web survey is encouraged or not by others. Moral obligations are defined as the extent to which an individual feel morally obligate to participate in web surveys. According to Bosnjak et al. (2005), moral obligation reflects internalised moral rules, not perceptions of others' ideas about what one should do.

Bosnjak and Batinic (2002) reveal that the moral obligation plays a vital role in predicting the willingness to participate in web surveys. Since the effects of the attitude, subjective norm, and moral obligations have been tested empirically (e.g., Bosnjak et al., 2005; Fang et al., 2009), there is no need for hypotheses about their main effects on participation willingness. Instead, the following several hypotheses involving topic involvement, topic sensitivity, trust, and reputation are proposed.

Figure 1 The proposed model to predict web survey participation decision



3.2 Research hypotheses

Topic involvement refers to a potential respondent's perception of the topic importance or relevance of a web survey. In mail surveys, researchers have found that response rates for topics with high involvement are higher than response rates for topics with low involvement (Groves et al., 2004; Kenhove et al., 2002; Roose et al., 2002; Wijnen et al., 2007). Under the condition of high involvement, a potential respondent will attend carefully to surveys, analyse the context of the survey, and come to a conclusion (Kenhove et al., 2002). Commitment involvement theory also suggests that an individual who is strongly committed to an activity will be unlikely to terminate that activity (Cobanoglu and Cobanoglu, 2003; Helgeson et al., 2002). People are more likely to respond to surveys if the topic, the sponsor, or the researcher is relevant to them. The level of involvement will determine the degree of commitment to survey participation (Albaum et al., 1998). Under the context of web survey, topic involvement, compared with traditional survey modes, becomes even more salient because potential respondents have more independent and initiative in decision whether or not to respond a survey. Therefore, we expect that

when a web survey's topic is of high involvement, potential respondents are inclined to form a positive attitude toward the survey and will thus be more willing to participate in it. Thus, we propose the following two hypotheses:

H1(a) Topic involvement positively affects a potential respondent's attitude toward a web survey.

H1(b) Topic involvement positively affects a potential respondent's participation intention.

Topic sensitivity is "the uneasiness with which an individual will communicate his or her attitude toward the growing influence of the extreme right in society" (Wijnen et al., 2007). Sensitivity is present when there are reasons to suspect that an individual's responses to a particular question, if disclosed, might put the respondent at risk (Pryor, 2004). In mail surveys, research shows that topic sensitivity has a negative association with participation intention (Catania et al., 1990; Wijnen et al., 2007). Similarly, in a web survey, potential respondents will be reluctant to participate in high topic sensitivity surveys to protect personal privacy. According to the theory of social exchange, participation in an exchange is determined by value assessments, based on cost/benefit analysis (Groves and Couper, 1998). Anxiety associated with high sensitive questions would be expected to increase if identification is requested (Childers and Skinner, 1996).

Participating in a high topic sensitivity survey will incur additional cost or risk for a respondent. Accordingly, we expect that topic sensitivity is negatively associated with the participation intention in a web survey and we propose:

H2(a) Topic sensitivity is negatively related to a potential respondent's attitude toward a web survey.

H2(b) Topic sensitivity is negatively related to a potential respondent's participation intention.

In this research, trust in sponsor refers to the belief potential respondents hold that the sponsor of a web survey is benevolent, honest, and has competence to protect information offered by respondents. Trust is the belief that the trustee will act cooperatively to fulfill the expectations of the trustor without exploiting its vulnerabilities (Pavlou and Fygenson, 2006). Many prior studies (e.g., Lee et al., 2006; Lusk et al., 2007; Pavlou and Fygenson, 2006) indicate that it is reasonable and necessary to add the variable of trust into the model to predict the behaviour intention in an online environment. Trust creates the positive expectation about the outcomes of the actions of a trustee, thus forming the positive attitude (Kim et al., 2008; Pavlou and Fygenson, 2006).

Prior studies also reveal that trust can affect the intention of a trustor (Gefen et al., 2003; Lee et al., 2006). The literature related to trust contends that a trustor lacks

control over a trustee's behaviour, whereas trust builds the trustor's confidence to rely on the trustee (Fukuyama, 1995). Trust reduces the trustor's efforts to deal with potential contingencies (Gefen, 2002) as well as leads to a great controllability over the behaviour. Trust is shaped by overcoming emotional barriers to engaging in an activity (Pavlou and Fygenson, 2006). Mukherjee and Nath (2003) also find trust to be statistically significantly related to relationship commitment to an online vendor.

Accordingly, in the web survey context, it is reasonable to expect that potential respondents are more willing to participate in a web survey when they trust in the sponsor of the survey. For the reasons mentioned above, the following two hypotheses are proposed:

H3(a) Trust in a sponsor positively affects a potential respondent's attitudes toward the survey.

H3(b) Trust in a sponsor positively affects a potential respondent's participation intention.

We define reputation as the degree of esteem a potential respondent holds toward a sponsor. Reputation building is a social process dependent on past actions (Kim et al., 2008) and in particular, the degree of honesty that a sponsor demonstrated in the past. Therefore, the reputation of a sponsor can be viewed as a reflection of the past experience. Based on the reputation of a sponsor, a potential respondent is likely to infer that the sponsor will act in line with his or her past behaviour modes. Reputation of a sponsor is connected with the perceived risk to participate in a survey. An individual is inclined to trust in a sponsor possessing a good reputation based on the reasoning that the sponsor honours the reputation. If respondents hold a sponsor in high esteem, they would be more willing to participate in a survey. In contrast, if respondents hold a sponsor in low esteem, or have serious doubts about his or her legitimacy, the probability of rejection will increase. From the perspective of corporate social capital, trust is a key element of corporate social capital, and the reputation of a corporation is a source of such capital (Preston, 2004). Accordingly, we propose the following three hypotheses:

H4(a) Reputation of a sponsor positively affects a potential respondent's trust in the sponsor of a survey.

H4(b) Reputation of a sponsor positively affects a potential respondent's participation intention.

H4(c) Reputation of a sponsor positively affects a potential respondent's attitude toward a web survey.

4 Research methodology and data collection

Most of the scales used in this research were adapted from previous research and some modifications have been made to fit the context of this research. A panel of experts reviewed the scales to identify any ambiguous items and ensure the content validity. According to the suggestions of the experts, some necessary changes were made to improve both the clarity of the questionnaire items and the content validity.

The questionnaire was composed of three sections. The first section was a web survey which we acquired in advance from the web; the second part was the measurement scales of the main constructs in the proposed model (respondent attitude, subjective norm, perceived moral obligation, trust in a sponsor of a survey, topic involvement, topic sensitivity, and reputation of a sponsor); the final section was the demographic section, including gender, age, education, and web experience.

4.1 Measurement scales

According to the recommendations of Ajzen (2006), a multi-item approach was used and each item was measured on a seven-point bipolar Likert scale. All of the constructs were measured by at least three indicators. All of these constructs were operationalised as reflective indicators.

The variables of intention, subjective norm, and attitude were operationalised according to the recommendations of Ajzen (2006) and Francis et al. (2004). These three variables were assessed by three, three, and four measurement items, respectively. The scale to measure the trust was adapted from Pavlou and Fygenon's (2006) scale and was composed of four items. The moral obligation scale was borrowed from Bosnjak et al. (2005), and we removed one item based on the results of the pre-test, thus three items were used. The reputation scale was adapted from Kim et al. (2008), and four items were used. The topic involvement scale was adapted from Mittal (1995) and was composed of five items. The topic sensitivity scale was adapted from Butler (1973) and consisted of four items.

4.2 Data collection

A self-administered questionnaire was used to collect data. To ensure adequate variance in topic involvement and reputation of sponsor, we devised four different versions of the first section of the questionnaire, i.e., high topic involvement versus low topic involvement and high reputation sponsor versus low reputation sponsor. The others were kept the same. The participants were randomly assigned to one of the four questionnaires.

The questionnaires were administered on a computer course. Three hundred questionnaires were administered, 264 returned and 16 questionnaires were eliminated for inconsistent and missing answers. Thus, 248 valid responses were obtained, securing an effective response rate of 82.7%. Of the 248 respondents, 60.1% were female and 39.9% were male. Most of the respondents were between the ages of 21 to 30 (66.1%). On average, the respondents have more than four

years web experience.

The use of college participants has sometimes been questioned on grounds of external validity. However, in this study, the use of college students as participants does not present a significant threat to validity as the students' profiles and performance are similar to the target population. Web users are also generally believed younger and more educated than conventional ones.

Since self-report measures from a single source were used to gather data, this study may suffer from the possibility of common method variance (Lee et al., 2007). Harman's single factor analysis was used to examine the possibility. The results indicated that common method variance was not a significant threat.

5 Results

Partial least squares structural equation modelling (PLS-SEM) was employed to test the proposed model. PLS-SEM relaxes the assumption of multivariate normality needed for traditional maximum likelihood-based SEM estimation techniques. Since PLS-SEM is based on a series of OLS regressions, it has minimum demands regarding sample size and generally achieves high levels of statistical power (Hair et al., 2012). However, the absence of a global optimisation criterion confines PLS-SEMs usefulness for theory testing and for comparing alternative model structures, so PLS-SEM is primarily used for exploratory research and for prediction (Ringle et al., 2012), which is the primary objective of this research.

5.1 Reliability

Cronbach's alpha and composite reliability were used to evaluate reliability of the scales. As shown in Table 1, all Cronbach's alpha are above the minimum cut-off score of 0.7 (Nunnally and Bernstein, 1994) and all composite reliability scores exceed the lowest limit (0.7), indicating adequate internal consistency (Fornell and Larcker, 1981).

5.2 Construct validity

To assess the construct validity, we examined convergent and discriminant validity of the scales. The standardised factor loadings for the measurement model are presented in Table 1. As shown in Table 1, the individual item loadings on the constructs are all significant ($p < 0.05$) with values ranging from 0.68 to 0.96.

Table 1 PLS confirmatory factor analysis and construct reliability

<i>Measurement items</i>	<i>Standardised factor loadings</i>	<i>t-value</i>	<i>Cronbach's reliability</i>	<i>Composite reliability</i>
Intention 1	.946	127.58	.937	.960
Intention 2	.960	125.87		
Intention 3	.921	48.52		
Attitude 1	.856	45.42	.908	.937
Attitude 2	.896	50.37		
Attitude 3	.902	51.19		
Attitude 4	.895	46.87		
Subjective norm 1	.885	50.23	.756	.860
Subjective norm 2	.883	47.39		
Subjective norm 3	.680	12.62		
Moral obligation 1	.865	37.33	.784	.874
Moral obligation 2	.778	15.92		
Moral obligation 3	.860	27.13		
Involvement 1	.844	38.06	.896	.924
Involvement 2	.834	25.30		
Involvement 3	.854	35.24		
Involvement 4	.833	30.60		
Involvement 5	.842	33.69		
Sensitivity 1	.787	3.55	.844	.885
Sensitivity 2	.854	3.65		
Sensitivity 3	.740	3.75		
Sensitivity 4	.858	3.52		
Trust 1	.885	44.48	.914	.939
Trust 2	.893	42.02		
Trust 3	.888	57.96		
Trust 4	.900	59.62		
Reputation 1	.801	5.34	.855	.871
Reputation 2	.734	3.85		
Reputation 3	.759	3.84		
Reputation 4	.872	3.68		

Tables 2 and 3 illustrate correlation matrix, average variance extracted, loadings and cross-loadings for reflective measures. As shown in Tables 2 and 3, all items load well on their respective factors, which are much higher than all cross loadings.

The square roots of all average variance extractions (AVEs) exceed 0.79 and are also much larger than all of the cross-correlations. The cumulative percentages of variance explained by each factor are larger than 67.49% for all constructs. In sum, these results indicate that the measurement scales possess acceptable convergent and discriminant validity.

Table 2 Correlation matrix and average variance extracted

	<i>INT</i>	<i>ATT</i>	<i>SN</i>	<i>MOR</i>	<i>TIV</i>	<i>TSE</i>	<i>TII</i>	<i>REP</i>	<i>Mean</i>	<i>SD</i>
<i>INT</i>	.942								4.83	1.51
<i>ATT</i>	.552	.887							4.50	1.40
<i>SN</i>	.516	.482	.822						4.13	1.34
<i>MOR</i>	.531	.318	.433	.835					4.97	1.40
<i>TIV</i>	.342	.419	.349	.219	.841				4.55	1.43
<i>TSE</i>	.013	.069	.068	.155	-.068	.811			3.63	1.56
<i>TII</i>	.521	.421	.385	.497	.233	.103	.891		4.98	1.52
<i>REP</i>	.226	.147	.159	.146	.117	.079	.115	.793	3.29	1.55

Notes: The values on the diagonal are the square root of average variance extracted (AVE), off diagonal values present the correlations among constructs. For discriminant validity, on-diagonal values should be larger than off-diagonal values (Chau, 1998).

5.3 Structural model testing

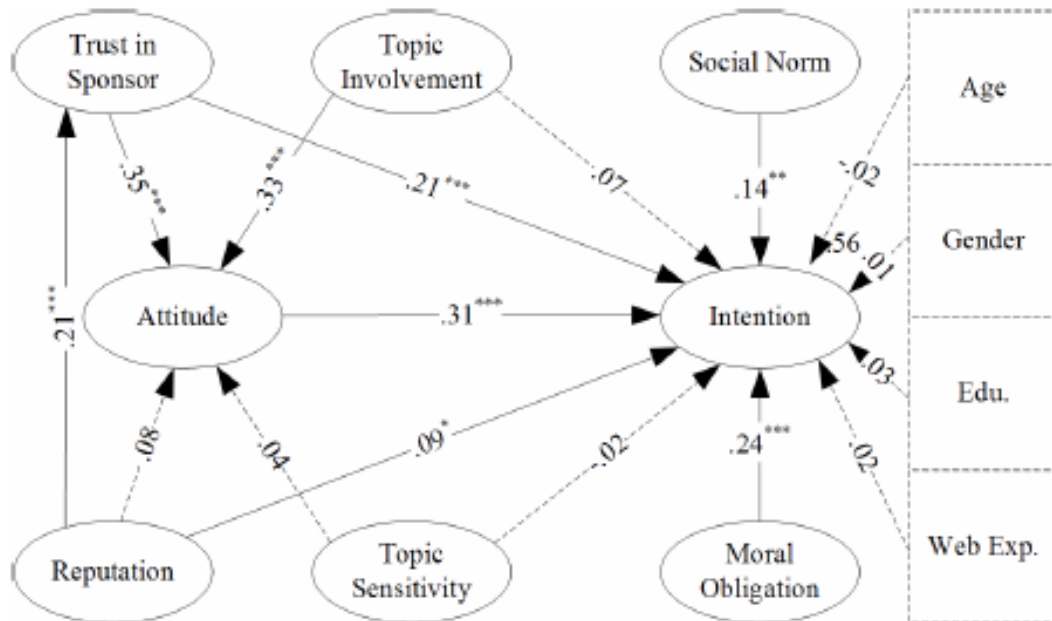
Figure 2 presents the standardised coefficients of the structural model testing. Four out of nine hypothesised paths were insignificant, i.e., the path from survey topic involvement to survey participation intention ($p = 0.14$), the path from survey topic sensitivity to attitude toward the web survey ($p = 0.40$), the path from survey topic sensitivity to participation intention ($p = 0.68$), and the path from reputation of the sponsor to attitude toward the web survey ($p = 0.12$).

The attitude, subjective norm, moral obligation, and trust in sponsor significantly affected the behavioural intention to participate in web surveys. The path from reputation of sponsor to intention was marginally significant ($p = 0.05$). The hypothesised paths from trust in sponsor and topic involvement to attitude toward the web survey were significant at the level of 0.001. Effect of reputation of the sponsor on trust in the sponsor was also significantly positive at the level of 0.001. The effects of the attitude, subjective norm, and moral obligations on intention to participate in web surveys were all significant, which is consistent with the prior research results (e.g., Bosnjak et al., 2005; Fang et al., 2009). The proposed model totally accounted for 56% variation of intention. Table 4 summarises the results of the hypotheses testing.

Table 3 Loadings and cross-loadings for reflective measures

	<i>INT</i>	<i>ATT</i>	<i>SN</i>	<i>MOR</i>	<i>TIV</i>	<i>TSE</i>	<i>TRU</i>	<i>REP</i>	<i>Eigenvalue and percent of explained variance</i>	
INT1	.957	.509	.494	.512	.307	-.033	.521	.201	2.665	88.82
INT2	.955	.547	.484	.495	.346	.020	.499	.244		
INT3	.884	.513	.507	.497	.330	.100	.446	.211		
ATT1	.469	.828	.395	.274	.430	.021	.351	.129	3.149	78.73
ATT2	.518	.877	.479	.310	.345	.060	.406	.109		
ATT3	.499	.855	.420	.302	.266	.083	.399	.126		
ATT4	.502	.878	.422	.269	.437	.069	.368	.201		
SN1	.447	.441	.874	.382	.352	.046	.322	.137	2.025	67.49
SN2	.450	.393	.886	.349	.263	.053	.268	.211		
SN3	.357	.362	.625	.322	.251	.023	.383	-.001		
MOR1	.509	.316	.456	.862	.219	.152	.414	.090	2.096	69.87
MOR2	.439	.256	.302	.778	.204	.055	.453	.172		
MOR3	.429	.274	.335	.832	.149	.143	.409	.137		
TIV1	.329	.341	.304	.218	.827	-.034	.259	.109	3.540	70.80
TIV2	.281	.349	.313	.193	.807	-.060	.122	.122		
TIV3	.327	.393	.316	.233	.839	-.042	.247	.039		
TIV4	.253	.339	.257	.119	.818	-.052	.129	.066		
TIV5	.317	.378	.361	.177	.823	-.095	.236	.125		
TSE1	.065	.042	.059	.237	-.051	.771	.202	-.010	2.738	68.45
TSE2	-.013	.057	.067	.113	-.060	.857	.087	.070		
TSE3	-.025	-.031	-.033	.037	-.116	.733	.014	.107		
TSE4	.010	.079	.054	.060	-.063	.843	.007	.120		
TRU1	.424	.336	.323	.452	.193	.083	.884	.038	3.183	79.58
TRU2	.415	.334	.310	.390	.106	.115	.888	.029		
TRU3	.513	.423	.321	.433	.244	.114	.878	.099		
TRU4	.506	.417	.399	.480	.246	.081	.893	.220		
REP1	.185	.197	.162	.124	.141	.033	.086	.798	2.786	69.66
REP2	.042	.028	.074	.026	.077	.050	-.065	.718		
REP3	.049	.029	.113	.052	.024	.119	-.060	.742		
REP4	.244	.112	.147	.165	.076	.058	.168	.832		

Figure 2 Structural model results



Notes: Standardised path coefficients are presented: * $p < .05$; ** $p < 0.01$; *** $p < 0.001$.
Control variables: age, gender, education, and web experience.

Table 4 Results of hypotheses testing

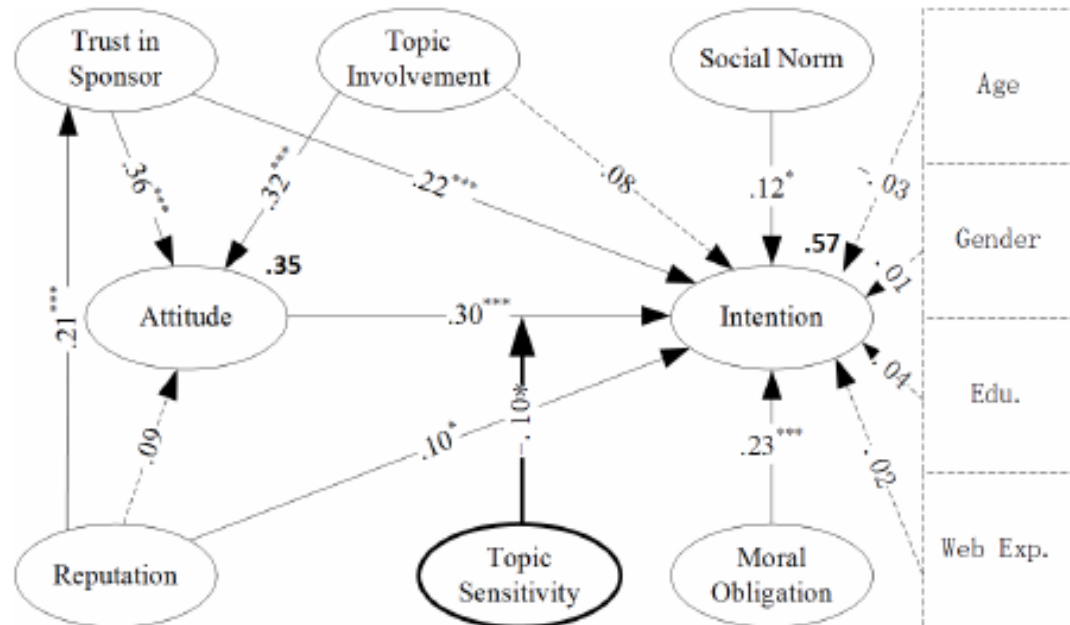
Hypothesis	<i>t</i>	Result	Hypothesis	<i>t</i>	Result
Topic involvement → Attitude	5.88	Supported	Trust → Attitude	6.35	Supported
Topic involvement → Intention	1.47	Rejected	Trust → Intention	3.86	Supported
Topic sensitivity → Attitude	0.84	Rejected	Reputation → Trust	3.42	Supported
Topic sensitivity → Intention	-0.42	Rejected	Reputation → Attitude	1.56	Rejected
Reputation → Intention	1.97	Supported			

5.4 Competing models

The research model proposed above assumed that variables such as topic involvement affected participation intention directly. However, it might be reasonable to position these variables as the moderators of relationship between attitude and intention. Accordingly, we changed the research model and proposed a competing model in which topic sensitivity was considered as a moderator.

To assess whether the moderating effect was significant, a bootstrap re-sampling procedure was conducted. The results of 1,000 re-samples indicated that the moderating effect was significant (see Figure 3) at the level of 0.05 ($\Delta R^2 = 0.009$, $t = 2.02$).

Figure 3 Structural model path coefficients (topic sensitivity as a moderator)



Notes: Standardised path coefficients are presented. Dash line denote insignificant coefficients. * $p < 0.05$; ** $p < 0.01$; *** $p < 0.001$.

Figure 3 indicates that one standard deviation increase in the topic sensitivity would decrease the impact of attitude to participation intention from 0.30 to about 0.20. The moderating effect or interaction effect, therefore, had an effect size f of 0.02 which is a small effect (Cohen et al., 2003). Compared with the significant effect between attitude and participation intention, the moderating effect was trivial. The beta tests suggested that even if topic sensitivity had a moderating effect, attitude was always a dominant factor affecting participation intention. Similarly, we tested moderating effect based on other exogenous variables, no significant effects were revealed.

6 Discussion and conclusions

This research explored factors affecting potential respondents' decision to participate in a web survey. The results showed that factors including attitude, subjective norm, moral obligation, trust in sponsor of the survey, and reputation of sponsor could influence the intention to participate in web surveys significantly. By contrast, topic sensitivity and topic involvement did not affect intention directly. Up to 56% variation of intention to participate in web surveys was explained by the proposed model.

Results indicate that topic sensitivity of web survey can moderate the relation between attitude and intention even though this effect is weak. Only extreme sensitivity of web survey topic (three standard deviations or upper) can reduce the

effect of attitude on participation intention. A possible explanation for this openness by online respondents may be the reduced social context information in online surveys is weak, which increases the respondents' perceived anonymity (Deutskens et al., 2006; Fang et al., 2009).

Compared to moral obligation, subjective norm has a less positive effect on intention. The result is consistent with prior research. Previous research showed that compared with traditional behavioural intention prediction subjective norm had less power over intention and actual behaviour prediction in an online environment (Bosnjak et al., 2005; George, 2004; Pavlou and Fygenson, 2006). It indicates that potential respondents are more prone to be influenced by the internal moral rules rather than the external social pressure in an online survey context. It can be explicated by the social anonymity (Christopherson, 2007) of the web survey.

In this study, topic involvement does not exert a direct impact on participation intention while it has a significant effect on attitude toward the web survey. Attitude mediates the relationship between topic involvement and intention to participate in web survey completely. Considering that topic involvement in this study is defined as a potential respondent's perception of the topic importance or relevant of a specific web survey, it is more proper to consider topic involvement as a precedent variable of attitude rather than of participation intention.

Results also indicate that trust in sponsor plays an important part in web surveys. It exerts significant positive effects on attitude and intention. Reputation of sponsor has no directly effect on attitude. The actual effect of the reputation is that it has a significant effect on trust in the survey sponsor. That is to say, the different level of reputation of sponsors lead to varied levels of trust in the sponsor, and the trust in turn has a significant effect on attitude and intention. Trust in sponsor completely mediates the relationship between reputation and attitude, and has a partial mediation between the reputation and intention.

6.1 Implications

Some practical implications can be gained from the results. First, a good reputation of a survey sponsor is an important determinant in potential respondents' decision process of whether or not to participate in a web survey. Good reputation of a sponsor provokes potential respondent's trust in the sponsor, and promotes survey participation intention. Because of the greater information asymmetry in the web context than that in the traditional environment, good reputation is critically important as it can be served as an excellent signal of low participation risk or cost. Recently, Fang et al. (2012) further show that a sponsor's reputation has a greater effect on the participation willingness of potential respondents of a web survey than the reputation of the survey provider. The results of these studies should draw the attention of the web survey researchers to contemplate the approaches to manipulate the reputation of the survey sponsors or the survey providers when they conduct the web surveys.

Second, attention should be paid to topic involvement. Although topic involvement cannot affect participation intention directly, it can exert an influence on the attitude toward a web survey and thus can generate intention to participate in the survey. Topic involvement is a subjective perception variable, it can be manipulated by researchers to enhance potential respondents' perception of topic involvement. For instance, the welcome screen before the formal web survey can emphasise the survey implications or the interest of topic to the respondents and thus enhance an individual's involvement with this topic.

Third, because moral obligation and subjective norm both have significant effects on participation intention, researchers are encouraged to give more emphasis to these variables when conducting web surveys. In reality, practitioners could manipulate the survey introduction pages or the survey invitations so as to let the potential respondents realise that responding to the web survey is consistent with social expectation and their view of themselves as helpful and responsible individuals.

In addition, the role of topic sensitivity on attitude and intention are not significant, which indicates that it may be feasible to conduct high sensitivity topic surveys through the web. Compared to traditional survey modes, potential respondents are more willing to express their opinions online because of the perceived social anonymity of web surveys.

6.2 Limitations and future research

It is important to note a few limitations in this study when interpreting the results. First, in this study we focus on participation intention, and do not measure actual participation behaviour. Although prior studies indicate that intention has a significant positive effect on actual behaviour (Ajzen, 1991; Bosnjak et al., 2005), it is necessary to include this variable in future research.

Second, topic sensitivity in this research is regarded as a control variable, and we measure topic sensitivity directly from the perception of individual respondents. Future work can consider manipulating this variable.

Third, this study primarily focuses on the roles of affective factors on participation willingness while some other utilitarian variables such as perceived benefits caused by monetary or non-monetary incentives can also trigger potential respondents' interests of participating in web surveys (Görizt, 2006). Therefore, future work could consider the effects of these factors. Further insights on participation willingness formation can be gained from the utilitarian perspective.

Acknowledgements

This work is supported by the first author's grants from the National Natural Science Foundation of China (Grant No. 71101018) and the Fundamental Research

Funds for the Central Universities (Grant No. ZYGX2010J131).

References

- Ajzen, I. (1991) 'The theory of planned behaviour', *Organizational Behaviour & Human Decision Processes*, Vol. 50, No. 2, pp.179–211.
- Ajzen, I. (2006) 'Constructing a TPB questionnaire: conceptual and methodological considerations', available at <http://www.people.umass.edu/aizen/pdf/tpb.measurement.pdf> (accessed on 12 November 2011).
- Albaum, G.S., Evangelista, F. and Medina, N. (1998) 'Role of response behaviour theory in survey research: a cross-national study', *Journal of Business Research*, Vol. 42, No. 2, pp.115–125.
- Bachmann, D., Elfrink, J. and Vazzana, G. (1999) 'E-mail and snail-mail face off in rematch', *Marketing Research*, Vol. 11, No. 4, pp.10–15.
- Bagozzi, R.P., Wong, N., Abe, S. and Bergami, M. (2000) 'Cultural and situational contingencies and the theory of reasoned action: application to fast food restaurant consumption', *Journal of Consumer Psychology*, Vol. 9, No. 2, pp.97–106.
- Bosnjak, M. and Batinic, B. (2002) 'Understanding the willingness to participate in online-surveys', *Online Social Sciences*, Hogrefe & Huber, Seattle.
- Bosnjak, M., Tuten, T.L. and Wittmann, W.W. (2005) 'Unit non response in web access panel surveys: an extended planned-behaviour approach', *Psychology & Marketing*, Vol. 22, No. 6, pp.489–505.
- Butler, R. (1973) 'Effects of signed and unsigned questionnaires for both sensitive and non-sensitive items', *Journal of Applied Psychology*, Vol. 57, No. 3, pp.348–349.
- Catania, J., Gibson, D., Chitwood, D. and Coates, T. (1990) 'Methodological problems in aids behavioral research: influences on measurement error and participation bias in studies of sexual behavior', *Psychological Bulletin*, Vol. 108, No. 3, pp.339–362.
- Chau, P.Y.K. (1998) 'Reexamining a model for evaluating information center success using a structural equation modeling approach', *Decision Science*, Vol. 28, No. 2, pp.309–334.
- Childers, T. and Skinner, S. (1996) 'Toward a conceptualization of mail survey response behaviour', *Psychology & Marketing*, Vol. 13, No. 2, pp.185–209.
- Christian, L.M., Dillman D.A. and Smyth, J.D. (2007) 'Helping respondents get it right the first time: the influence of words, symbols, and graphics in web surveys', *Public*

Opinion Quarterly, Vol. 71, No. 1, pp.113–125.

Christopherson, K.M. (2007) 'The positive and negative implications of anonymity in internet social interactions 'on the internet, nobody knows you're a dog'', Computers in Human Behavior, Vol. 23, No. 6, pp.3038–3056.

Cobanoglu, C. and Cobanoglu, N. (2003) 'The effect of incentives in web surveys: application and ethical considerations', International Journal of Market Research, Vol. 45, No. 4, pp.475–488.

Cobanoglu, C., Warde, B. and Moreo, P.J. (2001) 'A comparison of mail, fax and web Survey methods', International Journal of Market Research, Vol. 43, No. 4, pp.441–452.

Cohen, J., Cohen, P., West, S.G. and Aiken, L.S. (2003) Applied Multiple Regression/Correlation Analysis for the Behavioral Science, 3rd ed., Erlbaum, Hillsdale, NJ.

Deutskens, E. Ruyter, K.D. and Wetzels, M. (2006) 'An assessment of equivalence between online and mail surveys in service research', Journal of Service Research, Vol. 8, No. 4, pp.346–355.

Deutskens, E., Ruyter, K.D., Wetzels, M. and Oosterveld, P. (2004) 'Response rate and response quality of internet-based surveys: an experimental study', Marketing Letters, Vol. 15, No. 1, pp.21–36.

Dillman, D.A. (2000) Mail and Internet Surveys: Total Design Method, John Wiley, New York.

Fan, W. and Yan, Z. (2010) 'Factors affecting response rates of the web survey: a systematic review', Computers in Human Behavior, Vol. 26, No. 2, pp.132–139.

Fang, J. and Shao, P. (2007) 'An extended TPB model to explain potential respondents' intention to participate in web-based survey', IEEE Proceedings of 2007 International Conference on Wireless Communications, Networking and Mobile Computing, Wuhan University Press, Wuhan, China.

Fang, J., Shao, P. and Lan, G. (2009) 'Effects of innovativeness and trust on web survey participation', Computers in Human Behavior, Vol. 25, No. 1, pp.144–152.

Fang, J., Wen, C. and Pavur, R. (2012) 'Participation willingness in web surveys: exploring effect of sponsoring corporation's and survey provider's reputation', Cyberpsychology, Behavior, and Social Networking, Vol. 15, No. 4, pp.195–199.

Fornell, C. and Larcker, D. (1981) 'Evaluating structural equation models with unobservable variables and measurement error', Journal of Marketing Research, Vol.

18, No. 1, pp.39–50.

Francis, J.J., Eccles, M.P., Johnston, M., Walker, A., Grimshaw, J., Foy, R., Kaner, E., Smith, L. and Bonetti, D. (2004) *A Manual for Health Services Researchers*, Newcastle University, Newcastle.

Fukuyama, F. (1995) *Trust: The Social Virtues and the Creation of Prosperity*, The Free Press, New York.

Gefen, D. (2002) 'Reflections on the dimensions of trust and trust-worthiness among online consumer', *Data Base*, Vol. 33, No. 3, pp.51–90.

Gefen, D., Karahanna, E. and Straub, D. (2003) 'Inexperience and experience with online stores: the importance of tam and trust', *IEEE Transactions on Engineering Management*, Vol. 50, No. 3, pp.307–321.

George, J.F. (2004) 'The theory of planned behavior and internet purchasing', *Internet Research*, Vol. 14, No. 3, pp.198–212.

Göritz, A.S. (2006) 'Incentives in web-based studies: methodological issues and a review', *International Journal of Internet Science*, Vol. 1, No. 1, pp.58–70.

Groves, R.M. and Couper, M.P. (1998) *Nonresponse in Household Interview Surveys*, Wiley, New York.

Groves, R., Presser, S. and Dipko, S. (2004) 'The role of topic interest in survey participation decisions', *Public Opinion Quarterly*, Vol. 68, No. 1, pp.2–31.

Hair, J.F., Sarstedt, M., Ringle, C.M. and Mena, J.A. (2012) 'An assessment of the use of partial least squares structural equation modeling in marketing research', *Journal of the Academy of Marketing Science*, Vol. 40, No. 1, pp.414–433.

Heerwegh, D. and Loosveldt, G. (2007) 'Personalizing e-mail contacts: its influence on web survey response rate and social desirability response bias', *International Journal of Public Opinion Research*, Vol. 19, No. 2, pp.258–268.

Helgeson, J.G., Voss, K.E. and Terpening, W.D. (2002) 'Determinants of mail-survey responses: survey design factors and respondent factors', *Psychology & Marketing*, Vol. 19, No. 3, pp.303–328.

Hox, J.J., de Leeuw, E.D. and Vorst, H. (1995) 'Survey participation as reasoned action: a behavioral paradigm for survey nonresponse?', *Bulletin de Méthodologie Sociologique*, Vol. 48, No. 1, pp.52–67.

Hoyer, W.D. and MacInnis, D.J. (2010) *Consumer Behavior*, South-Western/Cengage Learning, Kentucky.

Kenhove, P., Wijnen, K. and Wulf, K. (2002) 'The influence of topic involvement on mail-survey response behavior', *Psychology & Marketing*, Vol. 9, No. 3, pp.293–301.

Kim, D., Ferrin, D. and Rao, H.R. (2008) 'A trust-based consumer decision-making model in electronic commerce: the role of trust, perceived risk, and their antecedents', *Decision Support Systems*, Vol. 44, No. 2, pp.544–564.

Lee, H.Y., Ahn, H. and Han, I. (2006) 'Analysis of trust in the e-commerce adoption', *Proceedings of the 39th Hawaii International Conference on System Sciences*, Big Island, Hawaii.

Lee, H.Y., Qu, H. and Kim, Y.S. (2007) 'A study of the impact of personal innovativeness on online travel shopping behavior – a case study of Korean travelers', *Tourism Management*, Vol. 28, No. 3, pp.886–897.

Lusk, C., Delclos, G., Burau, K. and Aday, L. (2007) 'Mail versus internet surveys determinants of method of response preferences among health professions', *Evaluation & the Health Professions*, Vol. 30, No. 2, pp.186–201.

Millar, M.M. and Dillman, D.A. (2011) 'Improving response to web and mixed-mode survey', *Public Opinion Quarterly*, Vol. 75, No. 2, pp.249–269.

Mittal, B. (1995) 'A comparative analysis of four scales of consumer involvement', *Psychology & Marketing*, Vol. 12, No. 7, pp.663–682.

Mukherjee, A. and Nath, P. (2003) 'A model of trust in online relationship banking', *International Journal of Bank Marketing*, Vol. 21, No. 1, pp.5–15.

Nunnally, J.C. and Bernstein, I.H. (1994) *Psychometric Theory*, 3rd ed., McGraw-Hill, New York.

Pavlou, P. and Fyngenson, M. (2006) 'Understanding and predicting electronic commerce adoption: an extension of the theory of planned behavior', *MIS Quarterly*, Vol. 30, No. 1, pp.115–143.

Preston, L.E. (2004) 'Reputation as a source of corporate social capital', *Journal of General Management*, Vol. 30, No. 2, pp.43–49.

Pryor, J.H. (2004) 'Conducting surveys on sensitive topics', *New Directions for Institutional Research*, Vol. 121, No. 1, pp.39–50.

Ringle, C., Sarstedt, M. and Straub, D. (2012) 'Editor's comments: a critical look at the use of PLS-SEM in *MIS Quarterly*', *MIS Quarterly*, Vol. 36, No. 1, pp.3–14.

Roose, H., Waege, H. and Agneessens, F. (2002) 'Response behavior in audience

research: a two-stage design for the explanation of nonresponse', *Developments in Social Science Methodology*, Ljubljana, FDV.

Sala, E. and Lynn, P. (2009) 'The potential of a multi-mode data collection design to reduce non-response bias: the case of a survey of employers', *Quality and Quantity*, Vol. 43, No. 1, pp.123–136.

Wijnen, K., Vermeir, I. and Kenhove, P. (2007) 'The relationships between traits, personal values, topic involvement, and topic sensitivity in a mail survey context', *Personality and Individual Differences*, Vol. 42, No. 1, pp.61–73.